

The Geopolitics of Natural Gas

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THE GEOPOLITICS OF RUSSIAN NATURAL GAS

BY

TATIANA MITROVA, PH.D.

HEAD OF THE OIL AND GAS DEPARTMENT
ENERGY RESEARCH INSTITUTE
RUSSIAN ACADEMY OF SCIENCES

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ABOUT THE STUDY

Some of the most dramatic energy developments of recent years have been in the realm of natural gas. Huge quantities of unconventional U.S. shale gas are now commercially viable, changing the strategic picture for the United States by making it self-sufficient in natural gas for the foreseeable future. This development alone has reverberated throughout the globe, causing shifts in patterns of trade and leading other countries in Europe and Asia to explore their own shale gas potential. Such developments are putting pressure on longstanding arrangements, such as oil-linked gas contracts and the separate nature of North American, European, and Asian gas markets, and may lead to strategic shifts, such as the weakening of Russia's dominance in the European gas market.

Against this backdrop, the Center for Energy Studies of Rice University's Baker Institute and the Belfer Center for Science and International Affairs of Harvard University's Kennedy School launched a two-year study on the geopolitical implications of natural gas. The project brought together experts from academia and industry to explore the potential for new quantities of conventional and unconventional natural gas reaching global markets in the years ahead. The effort drew on more than 15 country experts of producer and consumer countries who assessed the prospects for gas consumption and production in the country in question, based on anticipated political, economic, and policy trends. Building on these case studies, the project formulated different scenarios and used the Rice World Gas Trade Model to assess the cumulative impact of country-specific changes on the global gas market and geopolitics more broadly.

STUDY AUTHORS

Rawi Abdelal
Luay Al Khatteeb
Govinda Avasarala
Beibei Bao
Soner Cagaptay
Charles Ebinger
Jareer Elass
Andreas Goldthau
Peter Hartley

Simon Henderson
Trevor Houser
Amy Myers Jaffe
Robert Johnston
Ken Koyama
Azzedine Layachi
Michael Levi
Steven Lewis
Suzanne Maloney

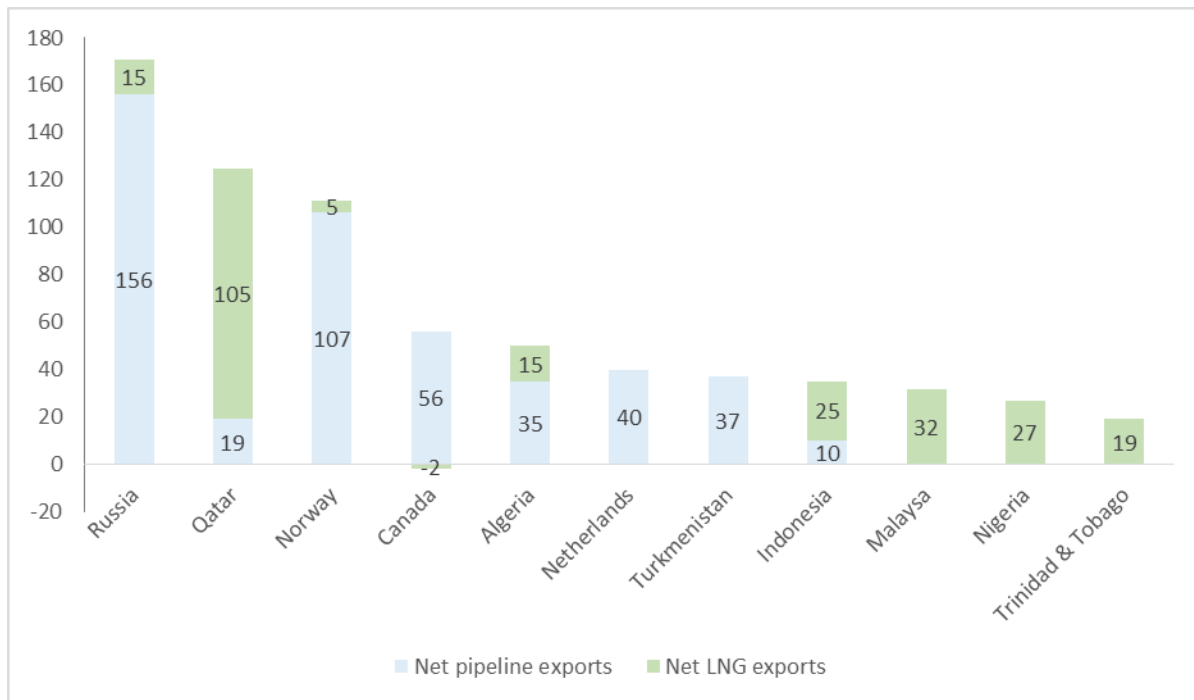
David Mares
Kenneth B. Medlock
Keily Miller
Tatiana Mitrova
Isidro Morales
Martha Brill Olcott
Meghan O'Sullivan
Ronald Ripple

Introduction

Russia is one of the world's leading producers of primary energy resources, and is especially well known for its strong position in the global gas markets. It holds the world's largest gas reserves and is currently the world's second gas producer after the United States, which recently outstripped Russia because of the shale revolution.

Nevertheless, Russia still preserves its status as the largest gas exporter in the world, leaving Qatar and Norway far behind (see Figure 1), and most likely will keep this position in the future (although Australia and the US are expected to become top exporters by the end of this decade).

Figure 1. Main Net Exporters of Gas (Pipeline and LNG) in 2012



Source: BP Statistical Review of World Energy 2013

Russia has a unique transcontinental infrastructure in the heart of Eurasia (150,000 km of trunk pipelines), which also makes it a backbone of the evolving, huge Eurasian gas market (which could include Europe, North Africa, the Commonwealth of Independent States (CIS), Caspian

Sea region, and Northeast Asia). Control over the transportation assets in this region together with vast gas reserves make Russia the key element of this new market.

Most of Russia's gas exports are directed to Europe and CIS, and in the future, a significant increase in Asian exports is expected. Russia's total of 170–200 bcm of gas exports make it significant from a natural gas perspective, as currently it alone provides for about 20% of the international gas trade. As a dominant supplier of both the European and the CIS gas markets (nearly 50% and 100% of total gas imports, respectively), Russia has a huge influence on the prices and on the “rules of the game” in these regions, as well as a certain geopolitical leverage.

Protecting oil indexation and long-term take-or-pay contracts, Russia remains a citadel of the traditional gas market model. Subsequently, it is one of the main ideologists of the Gas Exporting Countries Forum, promoting a “security of supply” approach to energy security with strong guarantees to producers.

In the context of this study, another unique feature is that Russia has used gas as an important geopolitical tool for many years. Gas is one of the key (and contradictory) elements of EU-Russian economic and political interplay. In the FSU and former Eastern Block area, gas is perhaps the main instrument of integration, allowing Russia to exercise its influence over these countries. Plans to expand LNG and pipeline exports to Asia reflect the Russian desire to extend relations and maybe even build strategic alliances with Asian countries (mainly China) in opposition to the US and Europe.

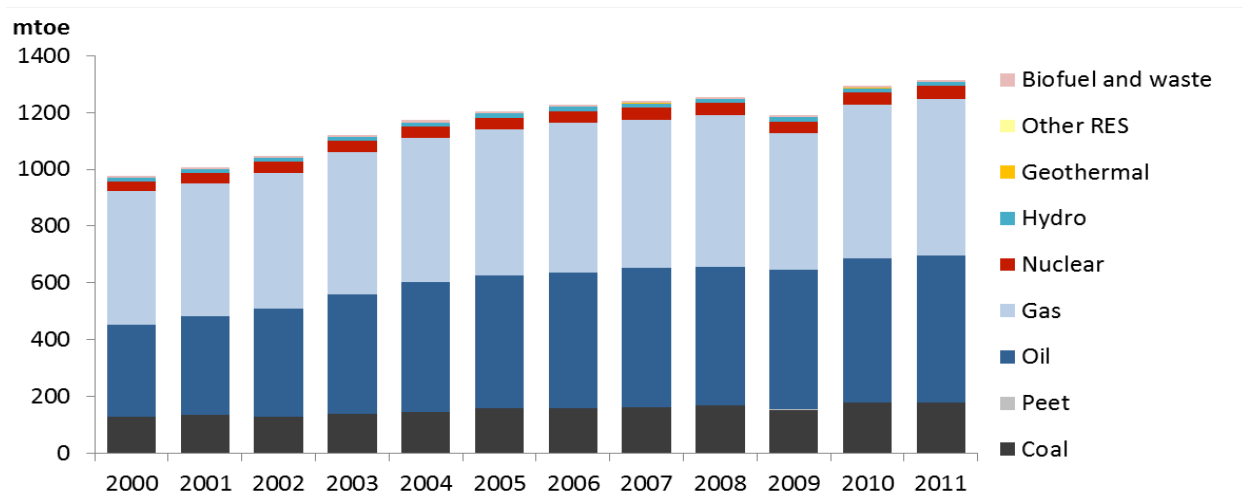
This geopolitical use of gas by the Russian government is often regarded as a geopolitical “weapon.” However, a more appropriate term would be “an instrument to obtain influence”—for the former empire, it is very important to possess such an instrument for international negotiations and to strengthen its soft power.

Russian Energy Policy Background

Russian Primary Energy Balance

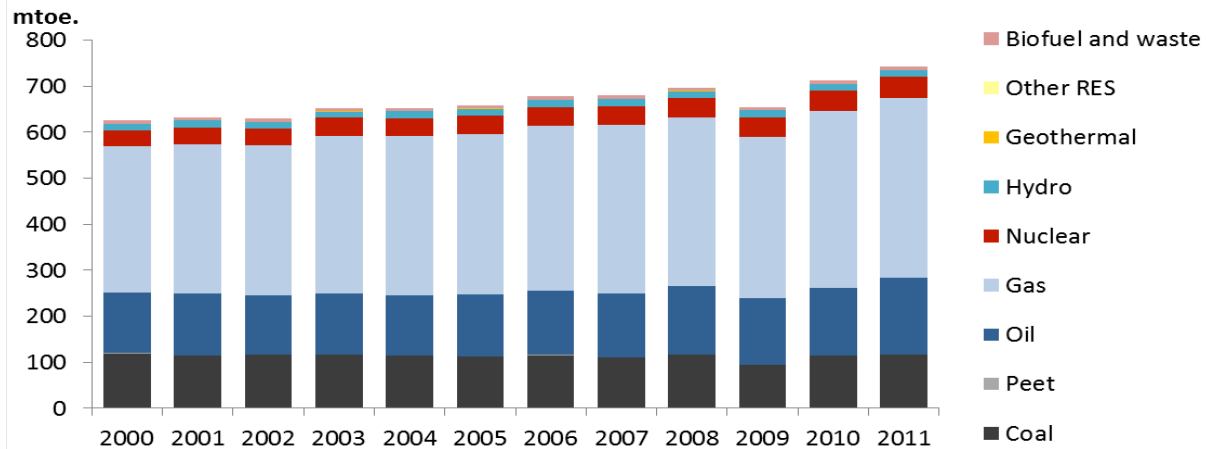
Russia is the world's third-largest producer and consumer of energy after China and the US. It produces 10% and consumes 5% of the planet's energy resources. Russia's energy sector, with its output of about 1300 thousand tons of oil equivalent (mtoe) (42% of which is provided by gas), allows the country to export 600 mtoe—12% of the world's energy trade. This makes Russia a global leader in energy exports and, at the same time, one of the largest energy consumers in the world with a huge domestic market (see Figures 2 and 3, and Table 1).

Figure 2. Russian Primary Energy Production, 2000–2011



Source: IEA statistics, September 2013

Figure 3. Russian Primary Energy Consumption, 2000–2011



Source: IEA statistics, September 2013

Table 1. Russia's Exports of Energy Resources, 2005–2013

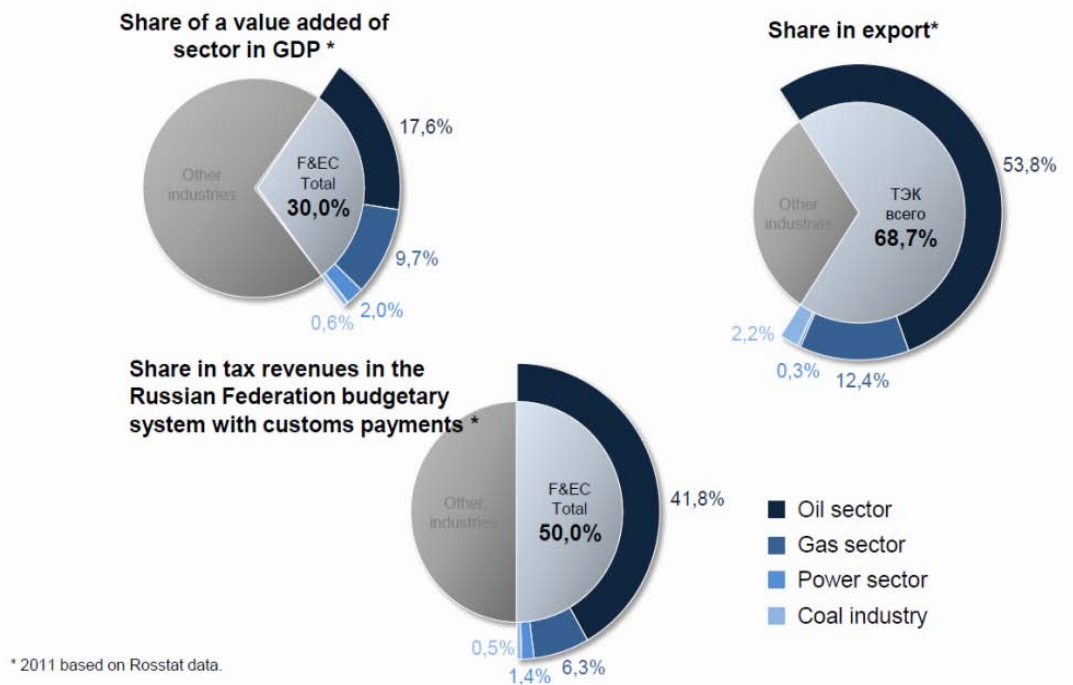
	2005	2006	2007	2008	2009	2010	2011	2012
Oil, million tons	252.5	248.4	258.6	243.1	247.5	250.7	244.5	240.0
Oil products, million tons	97.1	103.5	112.3	118.1	124.5	133.2	132.1	138.2
Natural gas (pipeline), bcm	209.2	202.8	191.9	195.4	168.4	177.8	189.7	178.7
LNG, bcm	0.0	0.0	0.0	0.0	5.1	14.6	13.9	13.1
Hard coal, million tons	79.7	91.4	98.0	97.4	105.1	115.7	110.5	130.4
Electric power, TWh	17.9	18.6	15.8	18.6	15.0	19.1	18.7	13.1

Note: Figures include oil and gas exported to member states of the Customs Union.

Sources: Bank of Russia, “Customs statistics of foreign trade of the Russian Federation” 2005-2013, data from OJSC Gazprom’s website

The energy sector is traditionally a crucial part of the Russian economy, providing for the bulk of its export revenues, budget incomes, and GDP. During the last two decades, the Russian economy became increasingly dependent on commodities exports (hydrocarbons in particular), despite numerous statements about the need to reduce dependence and the setting of targets. In 2011, oil, its products, and natural gas accounted for more than 67% of export yields, and customs duties and Mineral Extraction Tax (MET) on oil and gas provided more than half of federal revenues (Figure 4).

Figure 4. The Role of the Energy Sector in Russian GDP, Export, and Budget Revenues in 2011



Source: Energy Ministry, based on Rosstat data

Figure 4 illustrates quite well the significance of oil and gas sector revenues for the entire Russian economy. Oil and gas investments have a huge multiplicative effect, as they create an additional domestic demand for other industries' products and ensure the infrastructure development required for economic growth. Proceeds from hydrocarbon exports have an impact on the financial resources of manufacturers and service providers and, therefore, on business activity in the country and its economic development prospects.

These revenues play an even more crucial role in meeting budget expenditures, such as allocations for military and social purposes, and hence maintaining the country's social stability and integrity. The government is now trying to implement the president's electoral assurances, which requires greater budget expenditures, and its main hopes are focused on the oil and gas sector. Thus all events in this key economic sector are directly significant for national security — the government places special emphasis on the oil and gas industry, and the country's top authorities desire to exert maximum control over it.

Given the importance of the Russian energy sector to the economy, most key decisions about energy policy and regulation are made at the highest levels of the government. This is particularly true for the oil and gas sector: oil and gas revenues are a colossal resource for the government. Key decisions in the energy sector are usually made by President Putin. Below this level, multiple ministries and other executive offices work on the development of energy sector policy proposals and different aspects of policymaking (Figure 5).

Figure 5. State Institutions in the Energy Sector

Presidential Commission on the strategy of the fuel and energy complex development and environmental security	
Russian government	
Deputy Prime Minister	The Government Commission on the Energy Sector, Resupply of Energy Resources, and Economic Efficiency
Coordination of the work of federal authorities carrying out the state policy for the energy sector and manufacturing	
Ministry of Economic Development	Orchestration of the efforts of federal and regional authorities and other organizations towards a stable and favorable environment for the energy industry, assure energy conservation, efficiency and sensitivity to consumer demand
Development of state policy in energy efficiency for national or municipal needs, improvement of the economy's energy efficiency, licensing, accreditation of certifying bodies, and testing laboratories under requirements for nuclear and radiation safety	
Ministry of Energy	Federal Statistics Service (Rosstat)
Development and execution of the state policy and legislative regulation for the energy industries—electric power, oil production, oil processing, gas, coal, shale and peat complexes, oversight of main pipelines for gas, oil and their products, renewable energy, shared production of hydrocarbons, oil chemistry, state services, and management of state properties in the energy sector	Russian Energy Agency (REA)
	Central Control Administration of the Energy Sector
	Federal Antimonopoly Service (FAS)
	Federal Customs Service (FCS)
	Analytic Center (AC)
	Federal Tariff Service (FTS)

Ministry of Natural Resources and the Environment	Federal Service for Environmental, Technological, and Nuclear Supervision (Rostekhnadzor)
Development and execution of the state policy and legislative regulation for study, use, reproduction and protection of natural resources, land, environmental monitoring and pollution control, including radiation, industrial and consumer waste, state environmental monitoring, management of natural preserves, and state environmental evaluations.	Federal Service for the Supervision of Natural Resources
	Federal Subsoil Resources Management Agency (Rosnedra)

Source: Websites of the Russian government, Ministries, and Federal services

The state is not only developing “the rules of the game,” but also interfering into the everyday operational functioning of the energy industry. The state-controlled Rosneft produces nearly 50% of the country’s oil, and state-controlled Gazprom produces more than 75% of gas. The role of the private sector in the energy business is also substantial, though not as powerful as the state’s.

During the transitional period in 1990s, the energy sector was cross-subsidizing the rest of the economy, and due to the accumulated underinvestment it currently faces serious challenges:

- Outdated technical facilities and equipment (almost 60% in the electric power and gas industries, 80% in the oil processing), technological and environmental backwardness, extremely high energy intensity accompanied by insufficient investments in renovation and development of the energy industry
- Depletion of the Soviet legacy fields and an increasing share of the “heavy to produce” hydrocarbon reserves (tight and ultraviscous oil, wet and low-pressure gas), and reserves located in remote regions of the Eastern Siberia and the Far East, Yamal peninsula, Arctic continental shelf, and Caspian Sea
- Lack of competition, high concentration, and increasing state involvement in the operational management of the energy sector
- Strong fuel price disproportions, leading to the industry’s and the economy’s overdependence on natural gas, which accounts for about 53% of the domestic primary energy consumption

“Energy Strategy of the Russian Federation up to 2030”¹ is the basic document that sets out Russian energy policy. Officially, Russia’s energy policy aims “to make the most effective use of its natural energy reserves and the energy sector’s potential to secure steady economic growth, better living standards, and stronger positions on the global market.” According to this document, the most important strategic initiatives of the state in the energy industry are:

- Creation of oil and gas industrial complexes in the east of the country (which should allow the regions to not only become independent from outside energy and hasten their development, but also diversify exports flows to Asian Pacific countries)
- Exploration of the Arctic continental shelf and northern regions (which should help stabilize oil and gas production after a possible downturn in the traditional oil-producing areas of Western Siberia in 2015–2030)
- Development of the difficult and hard-to-access fields (primarily through different tax breaks)
- Development and territorial diversification of the energy infrastructure
- Renewable energy promotion
- Energy saving

As the state’s involvement in the energy sector in Russia is huge, and many features of the planned economy are still in place, this strategy is supplemented and—in some cases—modified by so-called General Schemes (Master Plans) for the oil, gas, coal, and power sectors. There are also several specific conceptions and programs, such as the Eastern Gas Program or the state program “Energy Efficiency and Development of the Energy Industry,” which introduces a number of energy-saving reforms, to be implemented in 2013–2020.

Other strategic documents correspond to the energy strategy; their priorities are efficiency, security, and reliability. For example, Russia’s pledge to the Copenhagen Accord is a 15–25% reduction in emissions by 2020 compared to a 1990 baseline (but so far it does not demand any additional efforts from the Russian side, as the level of Soviet energy consumption is still not achieved. Another target adopted by the Russian authorities for 2020 is to increase the share of

¹ The last edition was approved in 2009; the new, updated energy strategy up to 2035 is currently in development.

renewables in the electricity mix to 4.5%. Many of the environmental policies come from the Climate Doctrine Action Plan adopted by the government of Russia in April 2011. This plan sets out a range of measures for different sectors of the Russian economy, including economic instruments for limiting greenhouse gas emissions in industry and power generation. Another aim, a 40% reduction in Russia's energy intensity by 2020 compared to 2007, is much more ambitious. This target was announced by then-President Dmitry Medvedev in 2008, and its achievement would have substantial implications for energy use.

In conclusion, the government in Russia is heavily involved in the energy sector through policies that promote nuclear, renewables, and coal; limit gas demand growth; and help to diversify the fuel mix, and also through direct interventions in the functioning of the energy sector.

The Role of Gas in Russian Energy Policy

Gas plays the key role in Russian energy sector development. After huge gas discoveries in the Western Siberia in the 1970s and the government's decision to introduce a "gas pause" (in order to have time for the development of clean coal technology), gas gradually became a dominant fuel, and by 1991 it provided for 43% of total primary energy consumption in Russia. During the transitional period in the 1990s oil and coal prices were liberalized, while price regulation remained in the gas industry in order to protect the competitiveness of the national industry and avoid social tensions. As a result, gas became the cheapest fuel and its consumption increased at the highest rates. By 2012, its share in the primary energy consumption reached 53% (49% in electricity generation). This is one of the highest figures globally. Furthermore, the share of gas consumption as boiler and furnace fuel exceeds 95% in some regions, and at the same time this gas is supplied for 2,000–3,000 km from Western Siberia to the European part of Russia through only three trunk pipelines. This overdependence is regarded by the Russian government as a threat to national energy security. But fuel competition is not easy to promote: the problem is that the main coal producing assets are located in Eastern Siberia, and transporting coal by railroads pushes up the delivered cost substantially, making coal unattractive in the power sectors.

There are, however, more fundamental reasons why gas—despite its notably smaller contribution to the national budget²—is so important for Russia's economy: its role as a domestic political tool and as an instrument of foreign policy. While the oil sector is the revenue provider for the Russian budget, the gas sector has a much broader political agenda, including social issues (keeping energy costs as a share of household budgets low by cross-subsidization at the expense of industrial consumers, and providing improved living standards in remote areas by means of regional gasification), influence over the regions (including subsidization of individual depressed regions), low energy prices for domestic industries, increasing role in the Russian fiscal system, and providing financing for “projects of state importance” (like facilities construction for the Sochi Winter Olympics, the Asia-Pacific Economic Cooperation Summit in Vladivostok, etc.), as well as a source of revenue for vested interest groups and the political elite.

Gas also plays a key role in establishing Russia's credibility in the global energy economy and is an important tool in a number of significant foreign policy initiatives. It is one of the main instruments of Russia's integration into global trade, and especially of Russia's economic relationship with the EU. The development of various joint ventures and direct investments, as well as major foreign projects, helps integrate Russian business into global economic relations, gradually making Russia a full-fledged participant in the global economic system. In fact, gas is one sector of the global economy in which Russia possesses vast expertise and competitive advantage. These economic considerations and the available assets shape geopolitical consequences in many ways. Gas supplies, or implementation of gas projects, serve as a tool to preserve Russia's geopolitical impact in certain regions (e.g., the CIS, Eastern Europe, and the Balkans). In the post-Soviet area, gas is perhaps the main instrument of integration, allowing Russia to exercise its influence over CIS countries and promote regional integration organizations like Custom Union and EvrazEs (albeit by means of cost-ineffective solutions, such as expensive gas imports from Central Asia and Azerbaijan or gas supplies to Belarus at reduced prices). Gas was, and still is, the most important element in negotiations not only with Ukraine and Belarus, but with practically all countries bordering Russia. At the same time, due to the extremely high share of hydrocarbon exports in budget revenues, Russia itself is highly

² Oil accounts for the largest share of budget revenues—36% in 2012—because of high export duties and a high tax on production. The share of gas in budget revenues is far less important—only 5%—because both export duties and production tax are considerably lower than those on oil.

dependent on the external market conditions (first of all, on the prices and import volumes in Europe, Russia's primary market).

It is important for the Russian government to possess such an instrument for international negotiations and the strengthening of its authority. As a result, the decision-making process in the Russian gas industry is strongly influenced by the state. Key decisions are usually made directly by President Putin, who regards this sphere as strategically critical and follows its operation in detail. He is personally sustaining the balance of power between the main competing groups in the gas market (Gazprom, Rosneft, and Novatek), and he makes long-term commitments on upstream and infrastructure development, involvement of foreign partners, and—in many cases—the contract negotiations process.

Resources (financial and otherwise) to develop gas fields or build infrastructure for transportation are allocated by the companies, but under strict governmental control—especially regarding Gazprom, whose annual investment program has to be approved by governmental representatives.

Due to the scale of the new projects, the gas industry requires significant external finance for its resource development. So far, it has not had problems attracting international financing, as gas producing companies have demonstrated their high financial performance during the last decade and are regarded by the international banks as prime-quality borrowers. However, due to the country risks, they must pay higher credit interest than Western companies.

At the beginning of this decade, Russia's gas industry found itself in an unexpectedly difficult situation. Virtually all of its external and internal conditions had radically changed for the worse, and its former problems grown more acute and urgently needed to be addressed. The coming decade will be critical for the industry's development, and its prospects will largely depend on the government's pricing and institutional policies. Since gas accounts for the major share of the country's primary energy consumption and power generation, the cost of a mistake is extremely high in Russia, forcing the government to be very cautious in decision-making (and inevitably

increasing the uncertainties associated with the future development of the Russian gas market). The main problems currently facing the gas industry in Russia are the following:

- Depletion of gas fields in the traditional Nadym-Pur-Taz area of the Tyumen region and the need for developing new centers of gas production in the Yamal Peninsula, the Arctic continental shelf, East Siberia, and the Far East (most of the latter fields are characterized by high production and transportation costs)
- Changes in the gas industry's resource base with an increasing proportion of difficult to recover (low-pressure gas) and multicomponent reserves—wet gases characterized by complex composition with a high content of ethane, propane, butane, other hydrocarbons, as well as hydrogen sulfide and helium, which makes it necessary to develop gas processing and gas-chemical industry
- Technological backwardness in all stages (production, transportation, and processing)
- Imperfection of existing taxation and pricing systems, insufficient liberalization of the domestic market, and insufficient development of exchange trade mechanisms and pricing
- Transit risks associated with gas exports to Europe
- Decline in Russian gas sales on the European market due to poor demand (dampened by the crisis and slowly recovering), toughening inter-fuel competition with coal and renewables, stronger competition with the other suppliers of pipeline gas, and, especially, LNG
- Slow progress with the Chinese gas market (unfinished talks on the price issue and the choice between the eastern and western routes, and uncertainty regarding the time frame for relevant projects) as well as with the whole Asia-Pacific market, including slow development of LNG exports in this direction, fraught with losing a promising market niche
- High costs of most of the export projects that put Russia in a vulnerable position with toughening competition in the export markets
- Shrinkage of the promising niche for the Russian gas exports due to the increase in global energy efficiency and the development of renewable energy sources and unconventional gas resources

In order to deal with these challenges, the main strategic priorities of the state in the gas sphere, set out in the official documents, are the following:

- To reduce overdependence on gas and to diversify the fuel mix and thus “promote rational energy balance” (which includes reducing the share of gas in the structure of domestic energy consumption and increasing the share of non-fuel energy in the structure of the fuel and energy balance³). The target set in the 2009 Energy Strategy is to reduce the share of gas in the fuel mix from 54% to 46–47% in 2030.
- To promote energy efficiency and gas saving in order to limit gas demand growth.
- To efficiently develop the existing fields and begin developing new fields in order to compensate for declining production.
- To modernize and expand the gas transportation network, connecting new fields with the Unified Gas Supply System (UGSS), and to increase the system flexibility by UGSS capacity expansion (target is a 25% increase in capacity—from the current 69 bcm to 87 bcm by 2020).
- To fulfill export obligations, maintaining the position of Russian gas in Europe, while diversifying energy supplies and reducing dependence on European customers.
- To increase export volumes and revenues through diversification of export markets, primarily to the Asian market. The target is to increase the Asian markets’ share to 26–27% of total energy exports (and up to 20% of gas exports) by 2030.
- To diversify the structure of exports with a growing share of LNG, which is set to reach 15% of gas exports by 2030. The idea is to increase Russia’s share in the global LNG market from 4.8% to 10% by 2020 and to 20% afterwards.

Achieving these targets would be very difficult, as external conditions (including the US shale boom) are becoming more and more unfavorable for the Russian gas industry.

³ “Energy Strategy of Russia for the Period Up to 2030,” Ministry of Energy of the Russian Federation, 2010, p. 158.

Russian Natural Gas Resources and Reserves

Probable gas resources of the Russian Federation are estimated at 164.2 tcm, including 63.8 tcm of the resources at the continental shelf. According to the Ministry of Natural Resources, as of January 1, 2012, the country's extractable conventional gas resources amounted to 48.8 tcm of ABC1 gas and 19.6 tcm of C2 gas (Russian reserve classification), including those of the continental shelf that amount to 8 tcm. The significant part of these reserves is concentrated in the Nadym-Pur-Taz region in the Yamalo-Nenets Autonomous District, the center of Russia's gas production. The explored resources there represent 40% of the country's total, and most of them are in large and shallow deposits, which are convenient to tap (Cenomanian gas). This makes production much easier. The rest of the Yamalo-Nenets Autonomous District is also rich in natural gas, containing two-thirds of Russia's known resources of free gas.

The country's gas resources are characterized by an abundance of large fields. The state balance of January 1, 2011, listed 841 free gas deposits, with the 28 largest fields containing 70% of all Russian gas. The 77 second-largest ones, with supplies between 75 to 500 bcm, account for more than 20%. The distributed reserves of natural gas in the beginning of 2011 included 619 fields—25 of the largest and most of the second-largest ones. The undistributed resources are small or difficult to access.⁴ The most important natural gas fields in Russia are shown in Appendix 1: Most Important Natural Gas Fields in Russia.

In general, the structure of the Russian gas reserves is favorable, but challenges to development are determined by the reduction of highly productive and shallow reserves under commercial development, severe weather conditions, and the remoteness of new gas production regions from consumption centers. There is a need to develop large reserves of low-pressure gas; the percentage of rich condensate and helium gas in the proved reserves becomes higher. This necessitates the building of gas processing plants to develop these fields cost-effectively.

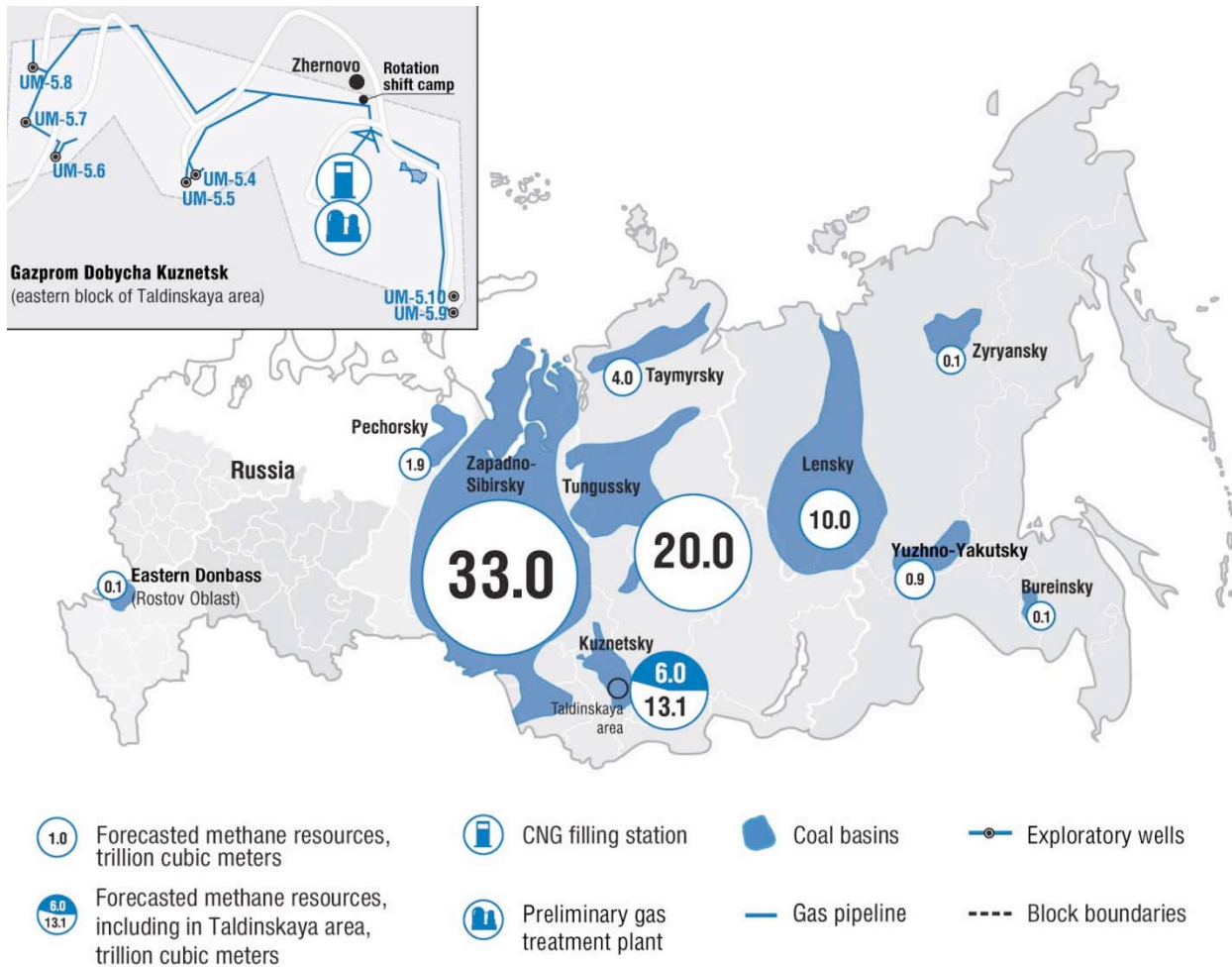
⁴ Ministry of Natural Resources and Environment, "On the condition and use of raw mineral resources of the Russian Federation in 2010."

The gas reserves of the fields under development, such as the Medvezhye and Yamburgskoye fields in the Tyumen Region (the main national gas producing region), have been depleted by 76–79% and reached a decline stage. The unique Urengoy field has been depleted by 54%.

In principle, Russia's gas industry has sufficient resource base for a much higher rate of production. However, this will require development of higher costs resources.

Russia also has unconventional gas resources—coal-bed methane (CBM), mainly located in coal mines in Eastern Siberia, and shale gas (Russia is in the very early stages of studying its shale gas potential). Russia is estimated to possess immense CBM resources of approximately 84 tcm, commensurate with one-third of the country's natural gas resources. With methane resources estimated to exceed 13 tcm, Kuznetsky in Eastern Siberia is currently the most suitable basin for commercial gas production (Figure 6). In February 2010 Gazprom inaugurated the first Russian facility for CBM production from the Taldinskoye field in the Kemerovo Oblast and produced 4.9 mln. cm of CBM in a pilot operation mode. Meanwhile, Gazprom arranged the trial use of CBM for power generation and as a motor fuel. Pilot commercial operation of the Taldinskoye field is to follow. According to early estimates, the Kuzbass basin may yield an annual 20 bcm of gas in the long term.

Figure 6. CBM Resources Development in Russia

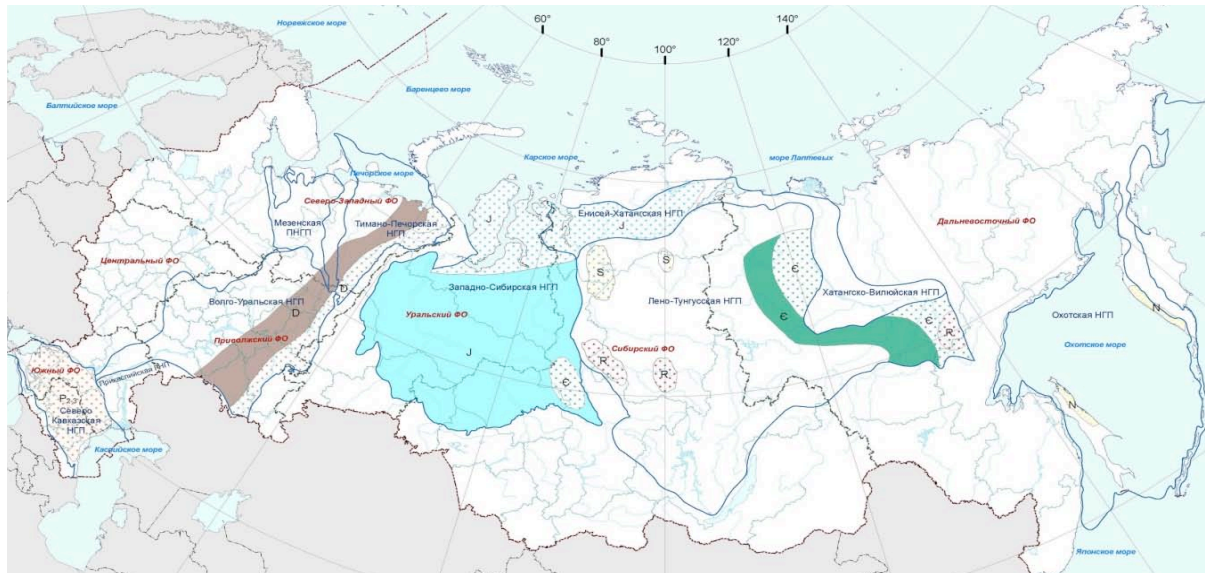


Source: Gazprom

The preliminary estimation data on shale gas in Russia are drastically different: 20–200 tcm. The most complete document related to hydrocarbon mining from unconventional sources in Russia is “National Program for Mineral Resources Base Preparation and Hydrocarbon Production from Unconventional Sources,” developed by the All-Russia Research Geological Oil Institute (VNIGRI) in 2011. Pursuant to the program, the potential shale gas resources in Russia are estimated at 48.8 tcm. Most resources are concentrated in Western and Eastern Siberia (Figure 7). If the actual drilling is initiated, reserve estimates will most likely be revised upwards, but so far there are no stakeholders interested in this business development in Russia. There is also no serious discussion in Russia concerning the future of shale gas in the country: most experts and

Gazprom and Russian Energy Ministry representatives agree that shale gas production in Russia is not economically feasible in the near future as compared to various conventional gas projects.

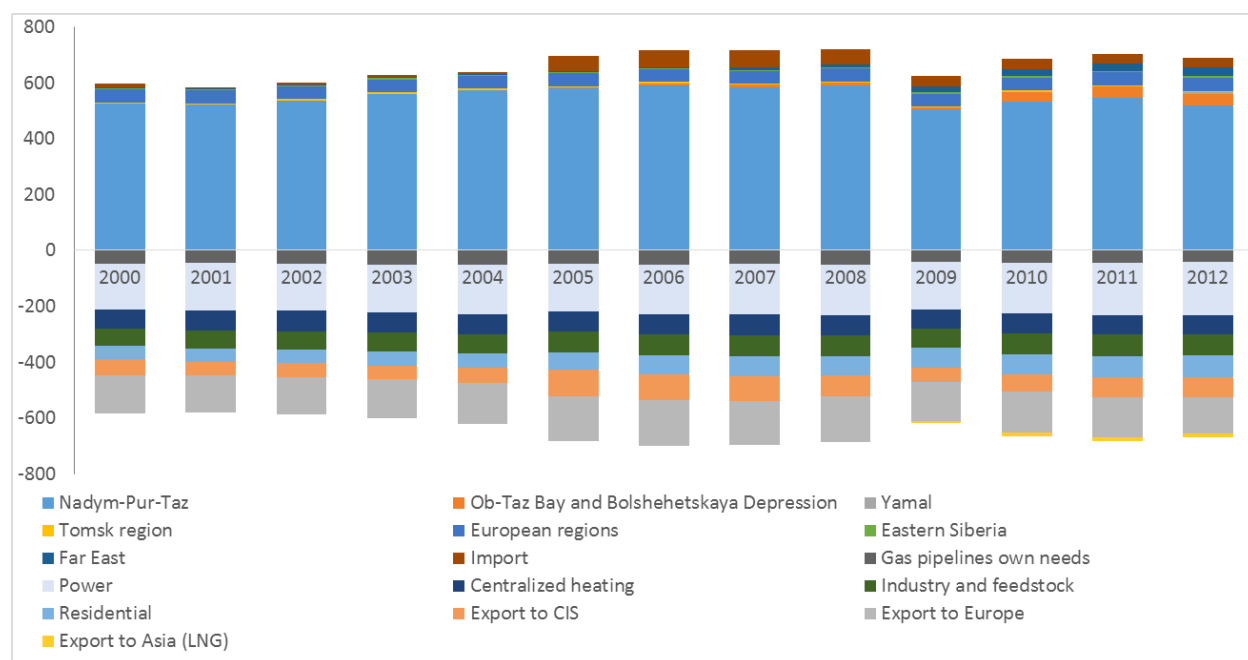
Figure 7. Shale Gas in Main Shale Formations in Russia



Source: All Russia Petroleum Research Exploration Institute (VNIGRI)

Natural Gas Demand and Supply Dynamics in Russia

Production and imports, which form the supply side of the Russian gas balance, have been increasing steadily from the early 2000s up until the crisis in 2009. The demand side demonstrated similar dynamics, with growing domestic consumption in all sectors of the economy and growing exports to Western Europe, the CIS, and the Asia-Pacific (Figure 8).

Figure 8. Natural Gas Supply/Demand Balance in Russia, 2000–2012 (bcm)

Sources: Federal State Statistics Service, Energy Research Institute of the Russian Academy of Sciences (ERI RAS)

The global economic crisis and the radical changes in the European gas market negatively affected the Russian gas industry. In 2009, gas exports in Russia fell by 16% and domestic gas consumption declined by 5%. Reacting to the adverse market situation, gas production went down 12% and gas imports were reduced by 33%. As a result, over the last five years, Russia's gas sector has undergone huge transformations in the upstream, midstream, and downstream segments.

Pre-crisis levels have not yet been achieved in the gas industry's main parameters, except for domestic consumption. The Russian gas industry remains in the state of stagnation, which is fraught with very serious consequences for the further development of the domestic gas market and gas price dynamics.

Gas Production Trends in Russia

In 2013, Russian gas production was 668 bcm (up 2% since 2012), with Gazprom providing 487 bcm of production. The basis of the Russian gas industry is formed by the Soviet legacy giant fields in Western Siberia (Figure 9) in the Nadym-Pur-Taz region (Yamburgskoe, Urengoyskoe,

and Medvezhie), which have been in a declining phase for quite a long time. Gazprom's giant Zapolyarnoye field, which has been producing since 2001, reached a plateau level of 130 bcm of gas per year in 2012,⁵ higher than initially planned. These huge fields assure low average prices of gas production in Russia—according to Gazprom, in 2009 they were about \$17/mcm; by 2012, they increased to \$31/mcm because of the higher Mineral Extraction Tax (MET), but are still very low compared to the next generation of fields.

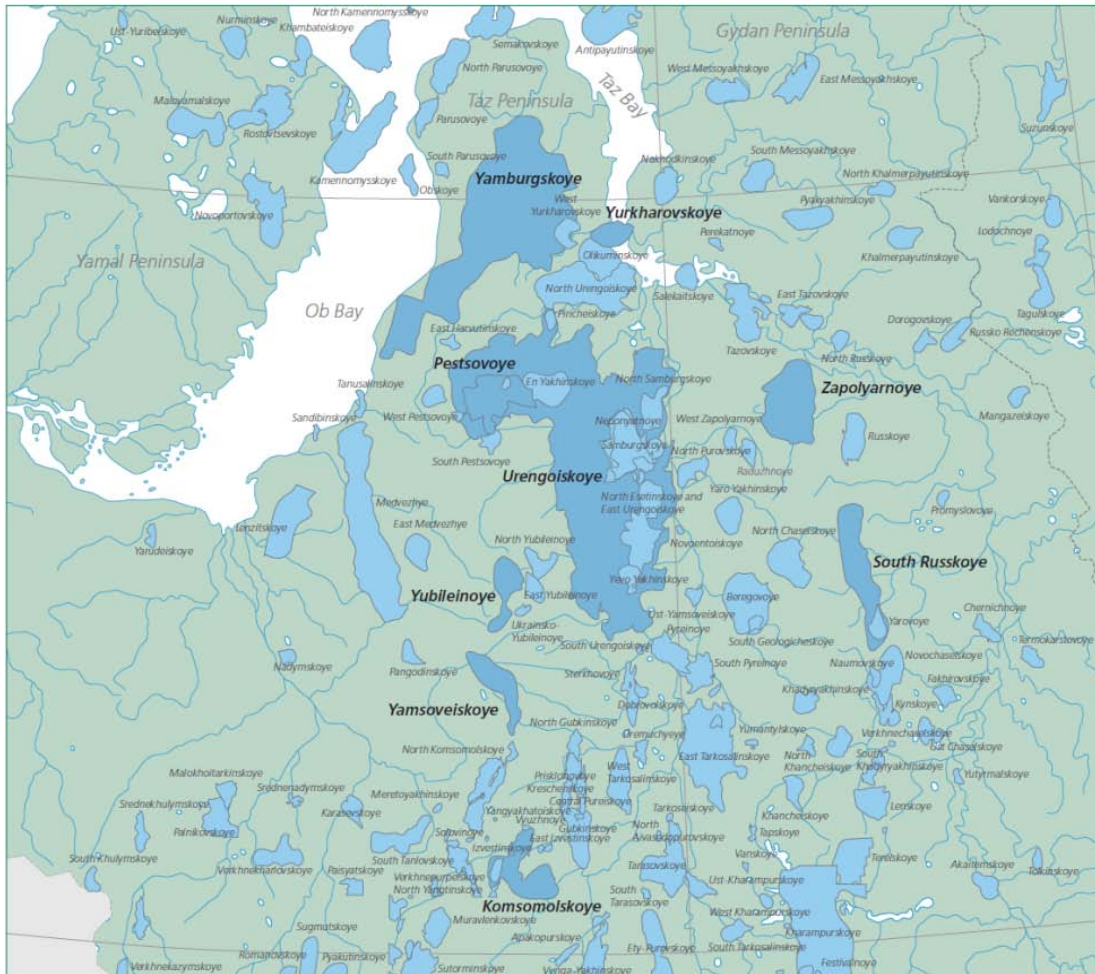
In order to replace these depleted fields, the Yamal's largest field, Bovanenkovskoe (with estimated gas reserves of 4.9 tcm), was commissioned in 2012 in line with investment decisions made before the crisis.⁶ In the long term, this additional gas can help offset the expected decline in legacy fields (which are believed to be approximately 60% depleted on average as for the Cenomanian layers) and offer a source of production growth, should consumption pick up in the coming years.

Additional sources of gas production growth are located in the Far East, where gas production currently reaches about 30 bcm, mostly from Sakhalin feeding the LNG plant.

⁵ Discovered in 1965. The overall reserves of the Zapolyarnoye gas field account for 3.3 tcm, of which 2.6 tcm lie in the Cenomanian layers and 735 bcm in the Valanginian layers.

⁶ Production may reach up to 90 bcm in 2015 and 115 bcm in 2017, when 775 wells were initially planned to be operational, and 140 bcm at a later stage. These targets may be revised somewhat to match the development of demand in Russia and abroad.

Figure 9. Western Siberia and Yamal Peninsular Field Map



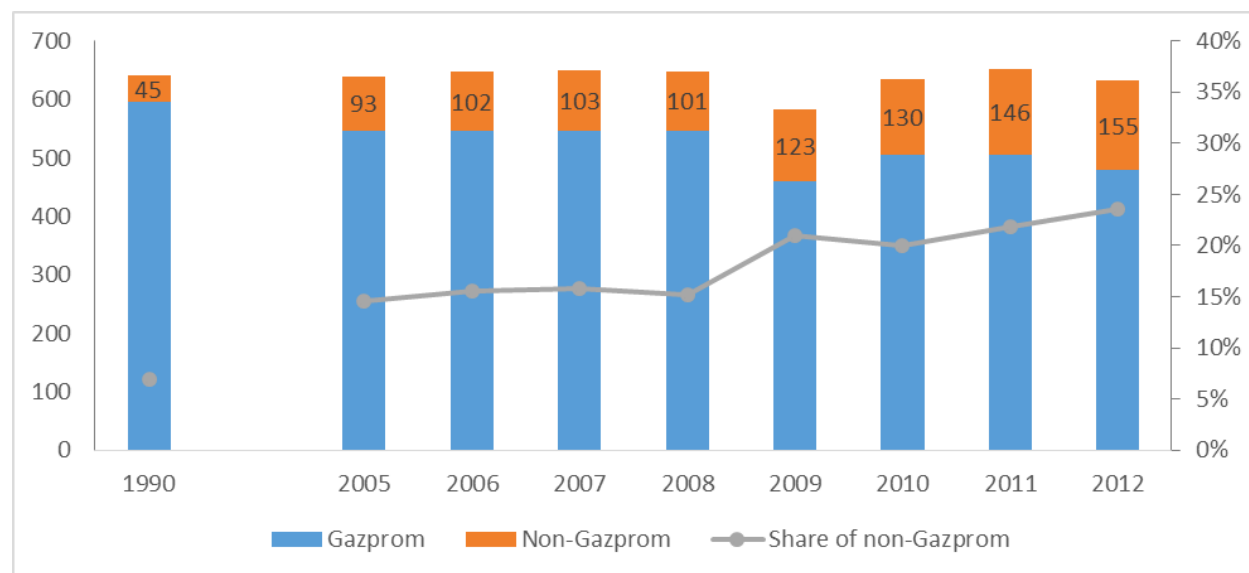
Source: Sberbank Investment Research

The commissioning of Bovanenkovo, the start of development of the deep-lying Neocomian and Valanzhin deposits at the Zapolyarnoye field and Achimov deposits at the Yamburg field (both fields are operated by Gazprom), and rapid production growth by the non-Gazprom gas producers (also called independent gas producers or IGPs) created a perceivable oversupply of gas on the domestic market.

Beginning in 2008, Russian gas producing companies have been forced to hold back production due to poor domestic and foreign demand. Since Gazprom was forced to assume the role of the main “shock absorber,” it has been losing its positions on the market to independent gas producers (Novatek and vertically integrated oil companies, primarily Rosneft) with every

passing year. From 2005 onward, the proportion of non-Gazprom gas producers in the total gas production has increased from 15% to 25% (Figure 10).

Figure 10. Changes in the Structure of Gas Production in Russia (bcm)



Sources: Federal State Statistics Service, ERI RAS

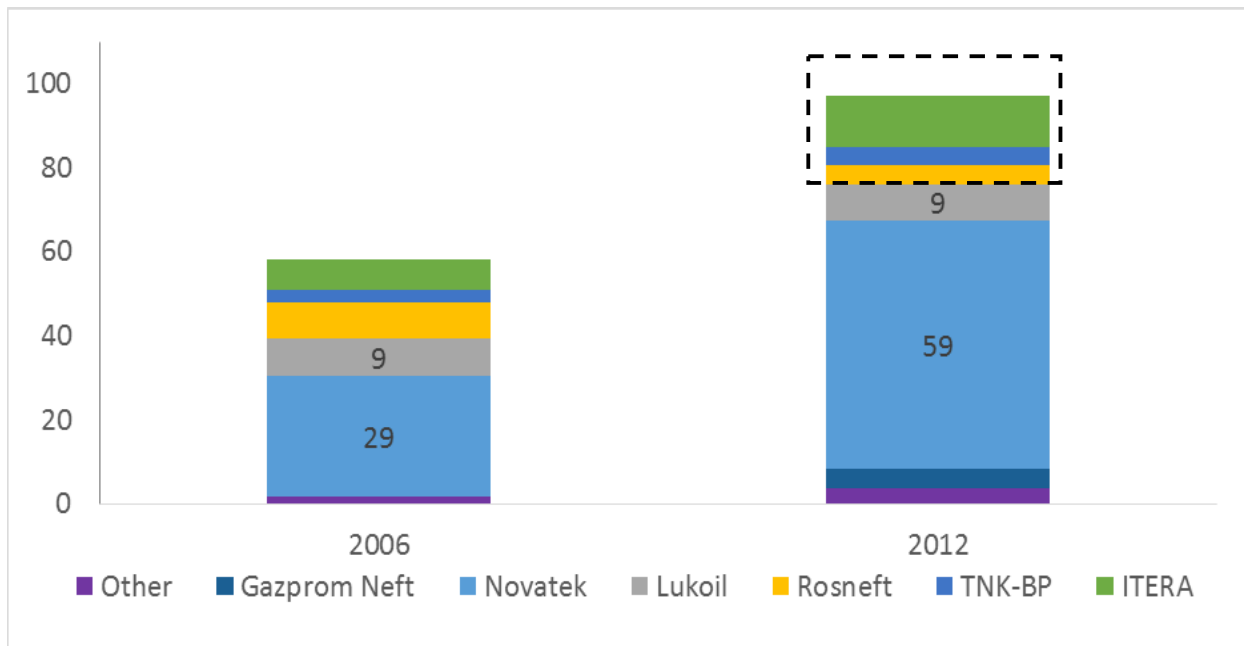
Simultaneously, non-Gazprom gas producers have increased gas supplies to the domestic market from 63.3 bcm in 2009 to 95.7 bcm in 2012. There has been a drastic increase in the amount of contracts awarded to IGPs by major gas consumers, including in the power industry. Thanks to their strong lobbying positions, IGPs have managed to secure unprecedented tax breaks and government support, which Gazprom often failed to obtain. Moreover, with the implementation of a stricter regulation and high fines for gas flaring, associated petroleum gas from oil companies is becoming a more important contributor—its share is 8.4% of the total, and is on the rise, from 43 bcm in 2005 to 55 bcm in 2012.

It must be noted that the growth of production by non-Gazprom gas producers does not mean the formation of a competitive market. In 2012, Novatek accounted for about 42% of the total commercial gas output of IGPs and approximately 60% of the gas supplied by non-Gazprom gas producers via the UGSS. Novatek is supplying gas to 35 regions of Russia. As of late 2011,

Novatek accounted for 100% of gas supplies to the Russia's largest industrial area, the Chelyabinsk region, including to the region's population and utility services.

Rosneft has also been aggressively expanding its gas business through mergers and acquisitions, and managed to increase its gas production from 8 bcm in 2006 to 21 bcm (Figure 11). Through the acquisition of ITERA, Rosneft has secured the position of 100% gas supplier for the Sverdlovsk region. Therefore, the market structure evolving currently in Russia is an oligopolistic system with a number of regional monopolies, while the traditional relations between Gazprom and its consumers are changing under the pressure of IGPs. Moreover, the growing proportion of non-Gazprom producers is beginning to influence prices on the market. Unlike in the past, when IGPs were generally charging higher than Gazprom (because they provided "above-the-limit" gas), in the past several years IGPs have increasingly often charged less than Gazprom and offered a 3–10% discount from the prices set by the Federal Tariff Service (FTS).

Figure 11. Structure of Gas Production by Non-Gazprom Gas Producers (bcm)



Sources: ERI RAS, Central Control Administration of the Fuel and Energy Complex

Non-Gazprom gas producers tend to develop into an increasingly powerful domestic institutional environment. Here it is appropriate to recall the decisions made in 2011–2012 to increase the Mineral Extraction Tax (MET) for Gazprom while reducing it for non-Gazprom gas producers. The new MET calculation procedure introduced in 2013, “taking into account geological and geographical specificities and market situation,” also favored the IGPs. Zero MET was established for natural gas injected back into formation in order to maintain formation pressure and for gas produced offshore and at the Yamal Peninsula. The law “On Amending the Federal Law ‘On Gas Exports’” adopted in late 2013 well deserves to be called a historic act as it liberalized LNG exports. The question of liberalizing pipeline gas exports is now being raised increasingly often.

Major Producers of Natural Gas

Gazprom is the largest state-controlled⁷ producer and supplier of natural gas (487 bcm in 2012). Gazprom’s monopoly is based on its status (established under the law “On Gas Supplies” of 1999) of a company responsible for supplying natural gas to consumers in Russia and fulfilling the country’s international obligations in natural gas supplies. Derived from this status is Gazprom’s right of forming long-term, yearly, and current gas balances. This status is supported by the Gazprom’s ownership of the UGSS in the European part of Russia and its licenses to develop the country’s largest gas fields. Furthermore, over the past 10 years, Gazprom consolidated most of the gas distribution companies into its group and thus controls the major part of gas supplies via the low- and medium-pressure networks, which also strengthens its monopoly position. Under the law adopted in 2006, the UGSS owner enjoys the exclusive right to export natural gas via pipelines and in liquefied form (export monopoly). In 2013, the LNG export monopoly was abolished, but the pipeline gas exports monopoly still remains.

In total, Gazprom operates 127 fields and 7,226 existing gas production wells.⁸ But 12 giant and super-giant fields provided for 95% of Gazprom’s gas production in 2012: Zapolyarnoye (112 bcm), Yamburgskoye (99 bcm), Urengoiyskoye (77 bcm), Pestsovoye (25 bcm), South Russkoye

⁷ In 2013, the state controlled 50.01% of the company through Rosneftegaz, the Russian Federal Property Agency (Rosimushchestvo), and Rosgazifikatsiya. Another 25.86% of Gazprom’s shares are traded as depositary receipts. Gazprom subsidiaries own 3.1% of the company’s shares.

⁸ Gazprom 2012 Annual Report.

(25 bcm), Yamsoveiskoye (20 bcm), Komsomolskoye (19 bcm), Yubileinoe (19 bcm), Orenburgskoye (16 bcm), Ety-Purovskoye (15 bcm), Medvezhye (12 bcm), and Astrakhanskoye (12 bcm). The majority of these fields came online during the Soviet era. In 2000–2012 Gazprom started production at Zapolyarnoye (Senomanian and Valanginian deposits), Bovanenkov, Vyngayakhinsk, Ety-Purovskoye, Yen-Yakhninsk, and South Russkoye fields; Tab-Yakhninsk, Pestsovoye, Western Pestsovoye production areas; the second unit of the Achimov deposits of the Urengoiyskoye field; the Aneryakhinsk and Kharvutinsk production areas of the Yamburgskoye field; the Nydinski unit of the Medvyezhye field; and the Yareisk production area of the Yamsoveiskoye field. The combined design output of these fields exceeds 350 bcm/year. Other fields are being prepared for production in the east of the country—Chayanda, Kovykta, Kirinskoe, South Kirinskoe, etc.

Novatek, the second largest gas producer in Russia (51 bcm in 2012) and the oldest non-Gazprom gas producer, has recently been pursuing an aggressive policy on the domestic market. Mergers and acquisitions (with Severenergiya, Sibneftegaz, Norgaz, and SIBUR), as well as the possibility of obtaining new licenses without competition (Geophizicheskoye, Salmanovskoye, North-Ob, and East-Tambey fields), allow the company to ensure a permanent expansion of its resource base and production (major promising projects include Nadym-Pur-Taz and Gydan Peninsula). The company controls 36 license areas, and nine are currently producing: the Yurkharovsk, Eastern Tarkosalinsk, Khanchevsk, Pureynoye, and Northern Urengoiysk fields and the Olimpiysk, Yumantilsk, Beregovaya, and Samburgsk production areas, with a total annual output of more than 50 bcm. Specific features of Novatek's business model include orientation on wet gas with a high content of condensate and a focus on gas processing. The company's fields in the Nadym-Pur-Taz region are located close to the transportation and refining infrastructure, which minimizes the expense of development. Novatek is developing a major project, Yamal-LNG, on the basis of the South-Tambey field, located on the Yamal peninsula on the shore of the Gulf of Ob. The other fields on the Gydan peninsula and partly in the waters of the Gulf of Ob are in close proximity to the South-Tambey field and could provide a resource base for the project expansion. Together with Rosneft, Novatek has succeeded in obtaining an LNG export permit.

Novatek is expanding into the regional markets. After acquiring Chelyabinsk Mezhhregiongaz, Novatek became the sole gas supplier for the Chelyabinsk region. Now Novatek is pursuing a similar policy in the Kostroma region. Novatek has been actively campaigning on the domestic market for long-term contracts with large industrial consumers (the largest being Mosenergo, Uralkali, Fortum, EON, InterRAO MMK, and Severstal—accounting for the combined amount of 36 bcm to be supplied over the next three years), to squeeze out Gazprom.

Rosneft started actively expanding its gas business in 2012 when Igor Sechin returned to the management, and was up to 41 bcm in 2012. Rosneft produces mostly associated petroleum gas, but plans to start gas production at the Vankorsky, Kharampursky, and Kunsko-Chaselsky fields, as well as at the Sakhalin-3 project and other assets it has consolidated. The company plans to produce as much as 100 bcm of gas by 2020⁹ and to increase its share in the domestic market up to 20%. Through mergers and acquisitions (ITERA, with annual production of 13 bcm, and TNK-BP with 12 bcm), the company has drastically expanded its production base over the last two years and continues aggressively buying up smaller companies. With Igor Sechin simultaneously heading the board of directors of InterRAO UES, Rosneft managed to shove Novatek off by securing two major contracts with that company for supplying 36 bcm over the next 25 years. Furthermore, Rosneft “inherited” the TNK-BP’s contract with IES Holding. Rosneft’s other major clients are Fortum and OGC-5. Rosneft is also aggressive on the regional markets, including in Bashkortostan, Perm, and Orenburg.

In the last year, Gazprom Neft, a Gazprom group member company, has assumed the strategy of asserting Gazprom’s interests on the gas market and helping Gazprom to maintain its share of the domestic market. Gazprom Neft’s major customer is Mosenergo, which is also a Gazprom group member company.

Lukoil is very cautious on the domestic gas market. It sells to Gazprom half of its gas output directly out of the wells and supplies the other half (6–7 bcm) to TGK-8 (a Lukoil group member company) under a swap agreement with Gazprom.

⁹ Presentation by V. V. Rusakova, “Natural gas is a promising growth resource for Rosneft.”

In total, there are 260 gas producing companies operating in Russia as of January 1, 2013, including nine vertically integrated oil companies, 14 companies affiliated with Gazprom, two affiliated with Novatek, and 128 independent companies and three companies operating within the framework of production sharing agreements. Yet only three companies represent the bulk of Russia's production: Gazprom (73.1%), Novatek (12.6%), and Rosneft (5%).

Some foreign companies are active within joint ventures, though foreign participation in the upstream is limited by the existing regulation. The legal framework with respect to the use of subsoil resources in Russia is established by the Subsoil Law.¹⁰ This law places significant limitations on granting licenses for subsoil use with respect to areas of subsoil considered to be of "federal significance," i.e., containing natural gas reserves of 50 bcm or more and those located in internal waters, territorial seas, or on the continental shelf of the Russian Federation.¹¹ For these areas, a license may be granted only to a Russian legal entity. Upon holding an auction/tender for the right to use such an area of subsoil, the government may also place restrictions on the participation of Russian legal entities if they are owned by foreign investors in whole or in part. For areas of subsoil located entirely or partly on the continental shelf, a license may be granted only to a Russian legal entity with no less than five years' experience in working on the continental shelf and in which the Russian Federation directly or indirectly holds more than 50% of shares. In practice, this means that these licenses are granted only to state-owned oil and gas companies (such as Gazprom and Rosneft) or, in some cases, to joint ventures with these companies (provided that the Russian Federation retains more than 50% of shares in the venture).¹²

Not only upstream investments but also all foreign capital investments in the gas sector (in exploration, production, transmission, wholesale supply, and export) are included on the list of business activities "which have strategic value for the defense of the state and national security support."¹³ This regulation de facto requires the president's personal permission for any deal

¹⁰ Federal Law "On Subsoil Resources" of February 21, 1992.

¹¹ Deloitte, "Tax and Legal Guide to the Russian Oil and Gas Sector," 2012.

¹² Ibid.

¹³ Federal Law of 29 April 2008 N 57-FZ, "On the Procedure of Foreign Investments into Economic Organizations of Strategic Importance for the Defense of the State and National Security Support," Russia Country Profile, 2008, <http://www.ebrd.com/downloads/legal/irc/countries/russia.pdf>.

involving foreign partners. It effectively restricts international cooperation in this sphere to mega-projects with state-controlled companies.

Only companies with over 50% of state ownership and over five years of experience in marine exploration are allowed to apply for licenses on the continental shelf in Russia's Arctic regions. No private companies are given access to these areas. As a result, 80% of licenses have already been allocated to Gazprom and Rosneft. Following the recognition that Russian companies would need foreign partners for the successful development of these challenging resources, a number of international oil companies (IOCs) entered into agreements establishing—in most cases—foreign registered joint ventures with Rosneft for the exploration of several licensing blocks located in the Kara, Barents and Okhotsk Seas, as well as the Black Sea. While the Russian company holds the license, these agreements generally involve a shareholder agreement of 33.33% for the foreign company, a commitment by the foreign company to finance exploration activities in line with license obligations and to develop joint technologies.¹⁴ Should gas or oil finds be made and the decision taken to move to a production phase, then the Russian partner would generally reimburse its share of exploration costs. The key challenge is now to ensure that an effective legislative and regulatory framework—especially within the Law on the Continental Shelf—is developed to define the role of an operator, to accommodate the fact that the license is strictly owned by a Russian company and that a foreign registered joint venture will be operator in projects, and that a robust framework is in place that protects the minority rights of foreign partners.

Production sharing agreements between the Russian Federation and investors (including foreign legal entities), though legally still allowed, are no longer supported by the government. Since 2000, no new PSAs have been signed in the oil and gas sector. There are only three active PSAs (Sakhalin-1, Sakhalin-2, and the Khariaginsky project), which were concluded before the current

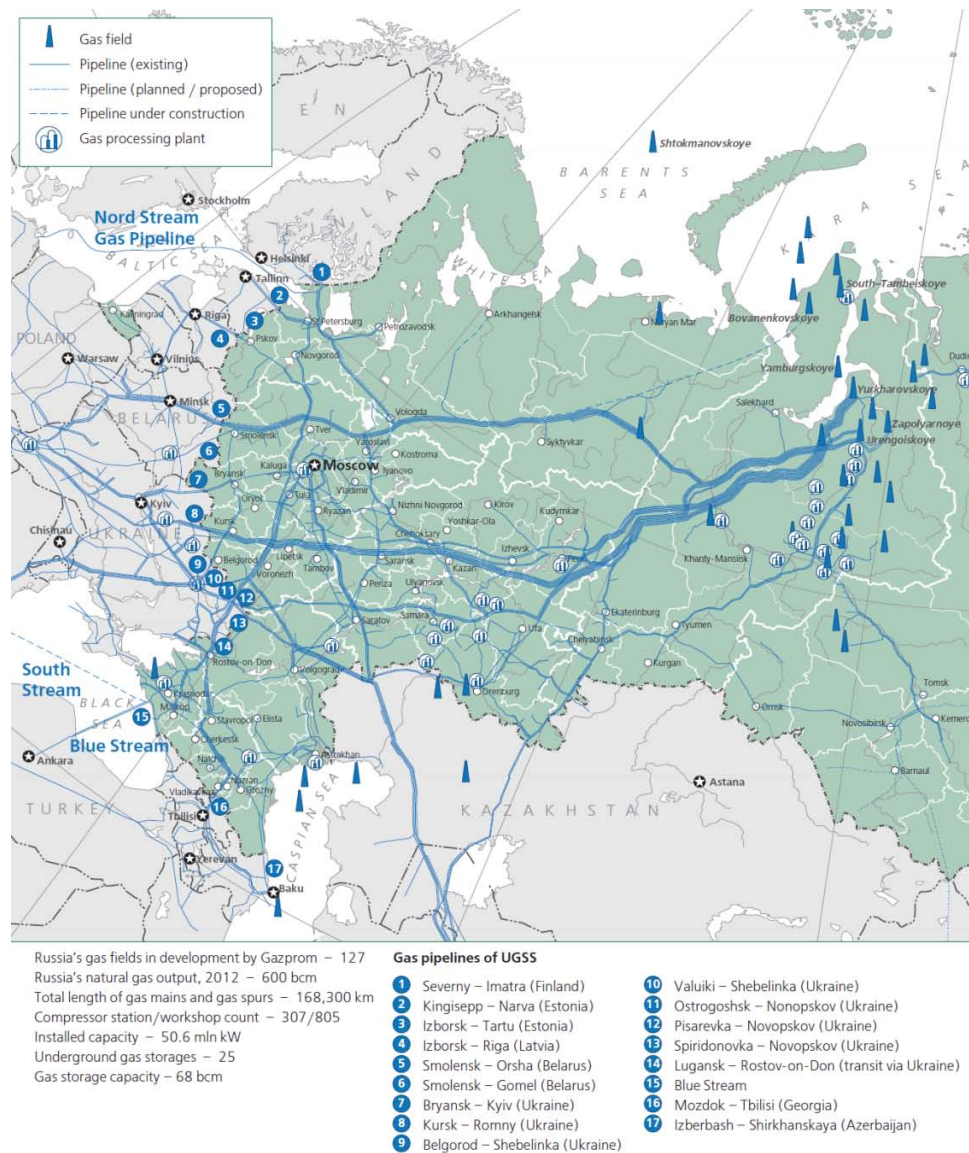
¹⁴ IOCs teaming up with these two Russian state-controlled companies have to operate on a risk-service basis and cannot own any equity—the license and the reserves. Indeed, under the current schemes developed for exploration works in the Arctic shelf, they are minority shareholders in foreign registered joint ventures in which Russian state companies Rosneft and Gazprom are majority shareholders. Foreign companies have insisted on establishing foreign joint ventures in order to benefit from greater legal security and have created complex contractual frameworks to overcome gaps and uncertainties in the Russian legislation. As such, there is room to further clarify the Russian legislation and regulatory framework to facilitate these partnerships between foreign and Russian companies.

Federal Law “On PSAs” entered into force in 1996, and as such are “grandfathered in.” Government officials have made several public announcements stating that the Russian Federation would not enter into new PSAs.¹⁵

Domestic Infrastructure Development

Russia has the world’s largest gas transportation network, called the Unified Gas Supply System (UGSS, see Figure 12), owned and operated by Gazprom, according to the law.

Figure 12. Unified Gas Supply System of Russia



Sources: Gazprom, Sberbank Investment Research

¹⁵ Deloitte, “Tax and Legal Guide to the Russian Oil and Gas Sector,” 2012.

UGSS is a unique engineering complex encompassing gas production, processing, transmission, storage, and distribution facilities. It includes 168,000 km of gas trunklines and laterals, 222 line compressor stations, and 25 underground storages (UGS) facilities. The average gas transportation distance for the domestic market is 2785 km, and 3430 km for exports.¹⁶ The main part of the UGSS dates back to the Soviet era—42,600 km of total transmission lines are less than 20 years old, 98,000 are between 21 and 40 years old, and 27,000 km are over 40 years old. Before the crisis, pipeline capacities were utilized at a very high rate, creating real deficit of capacities and problems with the pipeline access.

Over the past years, Gazprom was devoting a big share of its capital expenditures for the new gas pipeline construction to link up new production center on Yamal with the new export infrastructure, in particular 55-bcm Nord Stream, bringing gas directly to European consumers through the Baltic Sea and bypassing Ukraine. The most important Russian gas export pipelines are shown in Appendix 2: Major Russian Gas Export Pipelines Capacities.

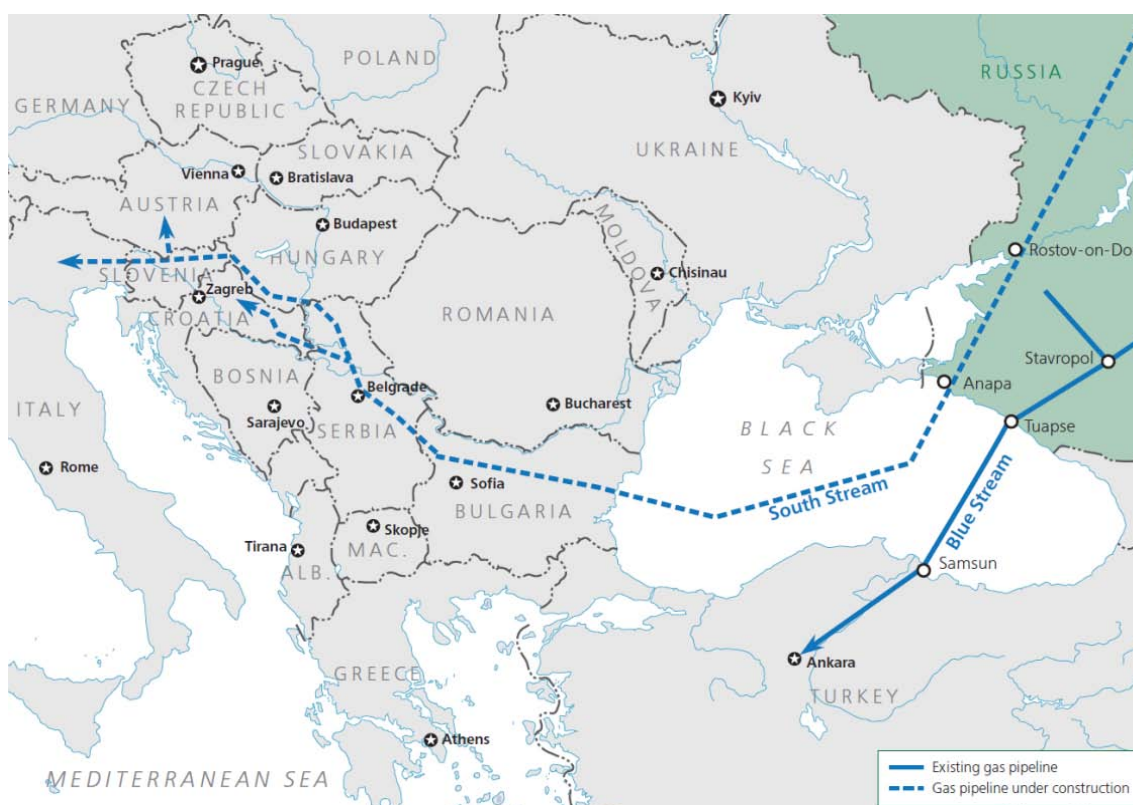
Nord Stream, a 1,224-km gas pipeline, crosses the Baltic Sea and directly links the Russian and European gas transmission systems. In November 2011, the first string of the gas pipeline was brought on stream. In April 2012, the second string was laid ahead of schedule. Construction of the 55-bcm Nord Stream gas export pipeline (running from Russia to Germany's Baltic Sea coast) is an example of Russia's policy to build new routes for direct gas exports to Europe that bypass transit countries. The first 27.5-bcm string of the \$11.4 billion pipeline was commissioned in November 2011. The second phase of the project was completed in 2012. The pipeline enjoys TEN status, which exempts it from restrictive provisions imposed by the EU's Third Energy Package on gas exporters. The interconnectors are the NEL and OPAL. Commissioned in 2011, the 36-bcm OPAL pipeline supplies mainly German and Czech customers, while the 440-km NEL pipeline is aimed westward to deliver Russian gas to storage facilities in Reden (Netherlands) and to the regional gas transportation network. There are also discussions on expanding the Nord Stream pipeline by adding a third and fourth line to the two existing lines and scaling up the compressor stations in order to bring an additional 55 bcm to northwestern Europe (reaching as far as the UK market).

¹⁶ Gas State Program.

The launch of the new Bovanenkovo-Ukhta gas transmission system¹⁷ in 2012 through which Yamal gas could be fed into the UGSS, the Ukhta-Torzhok pipeline (at full design capacity of 28.5 bcm), as well as the Pochinki-Gryazovets and Gryazovets-Vyborg trunk gas pipelines, and the expansion of the Urengoy gas transportation hub and the Tyumen region's northern areas-Torzhok trunk pipeline had to a certain extent alleviated the shortage of gas transportation capacities from the Nadym-Pur-Taz region and Yamal.

After the Nord Stream commitment, the next priority of Gazprom and the state is South Stream pipeline construction (Figure 13). In order to ensure uninterrupted gas supplies into the South Stream, the Southern Corridor gas pipeline system (Figure 14) is in development on the Russian territory with the capacity of 63 bcm/year. It requires construction of 2,500 km of trunk pipelines and 10 compressor stations. The project should be completed by 2017.

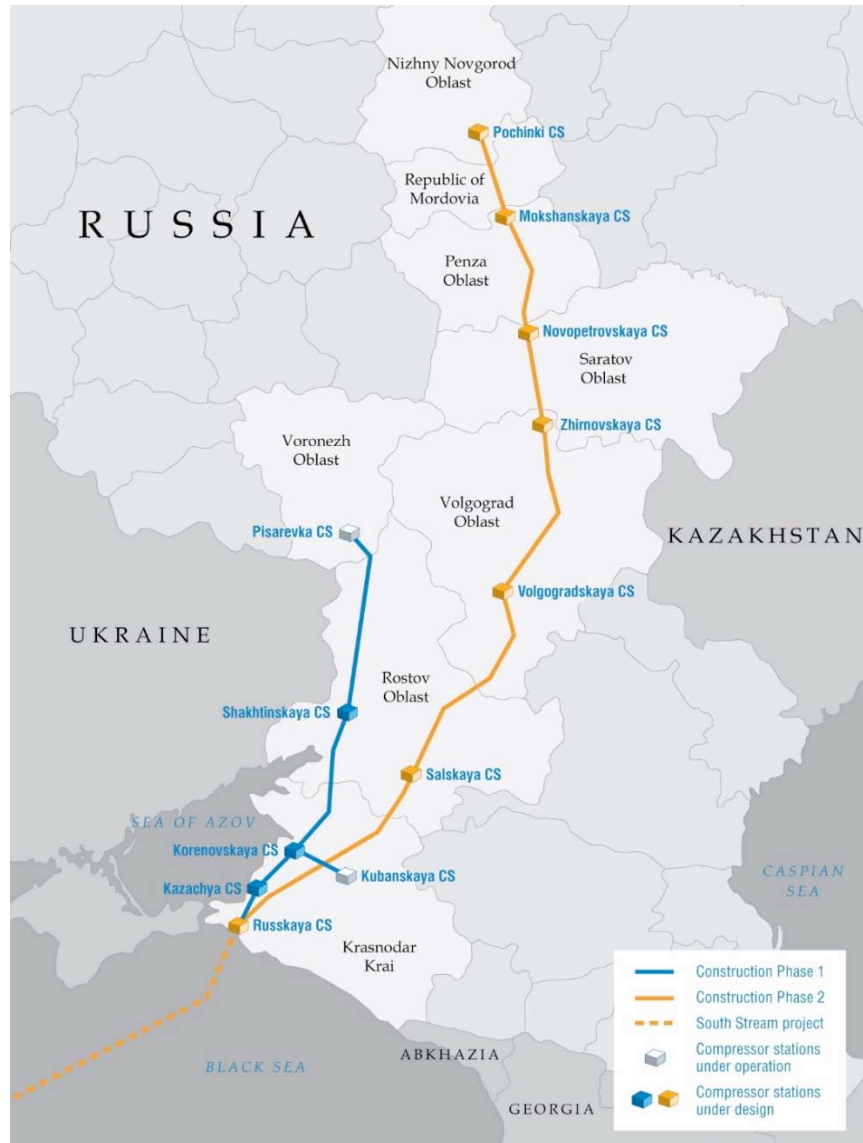
Figure 13. South Stream Pipeline



Source: Sberbank Investment Research

¹⁷ A multi-line, 2,400-km system to transport gas from the Yamal peninsula's Bovanenkovsk field with design production of 115 bcm per year (and in the long term, when Neocomian and Jurassic deposits are tapped, up to 140 bcm) to the central regions of Russia.

South Stream, a 63-bcm pipeline project, is meant to improve Europe's energy security by constructing a Ukrainian by-pass—a gas pipeline running under the Black Sea to Southern and Central Europe. It is supposed to link Russia's Black Sea coast with Bulgaria through four spurs and a pipeline system of eight compressor stations in Russia, two in Bulgaria, and two in Serbia. The total length of the Black Sea section will be some 900 km. In September 2011, the Shareholders Agreement of South Stream Transport AG was signed for South Stream's offshore section. October 2011 saw the completion of the South Stream Consolidated Feasibility Study, combining a feasibility study for the offshore gas pipeline as well as national feasibility studies for gas pipeline sections running across the countries of Southern and Central Europe. In December 2011, Gazprom obtained a permit for the construction of South Stream through the exclusive economic zone of Turkey. A detailed action plan was approved enabling them to proceed to the gas pipeline construction in late 2012. In April 2012, Gazprom's international partners finally joined the South Stream Transport AG project company. In September 2013, the board of directors approved a detailed construction schedule, endorsed the company's long-term budget, and confirmed the commissioning of South Stream's first offshore line before the end of 2015.

Figure 14. Southern Corridor Domestic Pipeline System

Source: Gazprom

Another new pipeline to be built in the near future is the 4,000-km Power of Siberia mega-project, which will pump gas from Eastern Siberian fields (Kovykta and Chayanda) through Khabarovsk to China and to Vladivostok (Figure 15). Its projected total capacity is 61 bcm. The Yakutia-Khabarovsk-Vladivostok gas trunkline (some 3,200 km) will be constructed at the first stage by 2017, and later the Irkutsk center will be connected to the Yakutia center by the gas pipeline. The pipeline route will run in parallel with the Eastern Siberia-Pacific Ocean (ESPO) operational oil pipeline, thus streamlining the infrastructure and power supply costs. The pipeline

will pass, inter alia, through swampy, mountainous, and seismically hazardous areas. In October 2012, the Gazprom Management Committee adopted the final investment decision on pre-development of the Chayandinskoye field, construction of the Yakutia- Khabarovsk-Vladivostok gas trunkline, and gas processing facilities in Belogorsk.

Figure 15. Power of Siberia Pipeline



Source: Gazprom

Underground storage is an important part of the Russian gas infrastructure. These facilities ensure the security of supply in case of failure or accident, especially during the heating season when consumption often peaks on both the domestic market and the export markets, whereas the capacity to ramp up daily production and transport gas in several parts of the pipeline system is limited due to technical constraints and long transportation distances.

Tariffs for services on gas transportation through the trunk gas pipeline system provided by Gazprom for independent organizations are approved by the Russian Federation (RF) Federal Tariff Service, according to the “Guidelines for calculation of tariffs on services for gas transportation through trunk gas pipelines.”¹⁸ The guidelines allow for tariff differentiation (tariff rate) depending on the direction of gas delivery to the domestic market—therefore, they vary from pipeline to pipeline and are set for one year. The guidelines also determine the setting of a

¹⁸ Approved by the Russian Federation Federal Tariff Service (RF FTS). Order dated August 23, 2005, No. 388-3/1 (edition of the RF FTS Orders dated November 7, 2006, No. 245-3/2; October 25, 2007, No. 286-3/4; September 17, 2008, No. 174-3/6 and December 2, 2011, No. 315-3/10).

two-rate tariff that includes a capacity tariff and a transmission tariff (the equivalent of a line tariff for transportation of a thousand cubic meters of gas per 100 km that previously was approved by the RF Federal Tariff Service). The capacity charge is the equivalent of the “entry-exit” tariff widely used abroad, when a tariff is set to transport a thousand cubic meters of gas between certain specific points (zones) on the entry and on the exit of the gas transportation system, irrespective of the actual transportation route. The transmission tariff is based on the average weighted transportation distance between entry and exit points gas transportation space average weighted matrix.

From 2008 to 2012, the average UGSS tariff for gas increased by one-third from \$1.45 to \$1.91 for every thousand cubic meters per 100 km. This resulted in serious consequences in terms of price growth for end customers. There are two reasons for such high growth. First, a large-scale investment program of Gazprom relating to extension and construction of new gas pipelines (including the onshore section of the North and South Streams and the Bovanenkovo-Ukhta-Torzhok pipeline) resulted in an appropriate growth of transportation tariffs. Second, confronted with demand limitations on the external and domestic markets, Gazprom moved its center of earnings from production and sales to transportation divisions.

The government is currently trying to limit this growth: under the Social and Economic Development Forecast in Russia for 2014–2016,¹⁹ the growth of tariffs for gas transportation through trunk gas pipelines for independent gas producers in 2014–2016 must not be higher than the level of wholesale prices for gas, and is scheduled to be at 0% in 2014, 4.8% in 2015, and 4.9% in 2016.

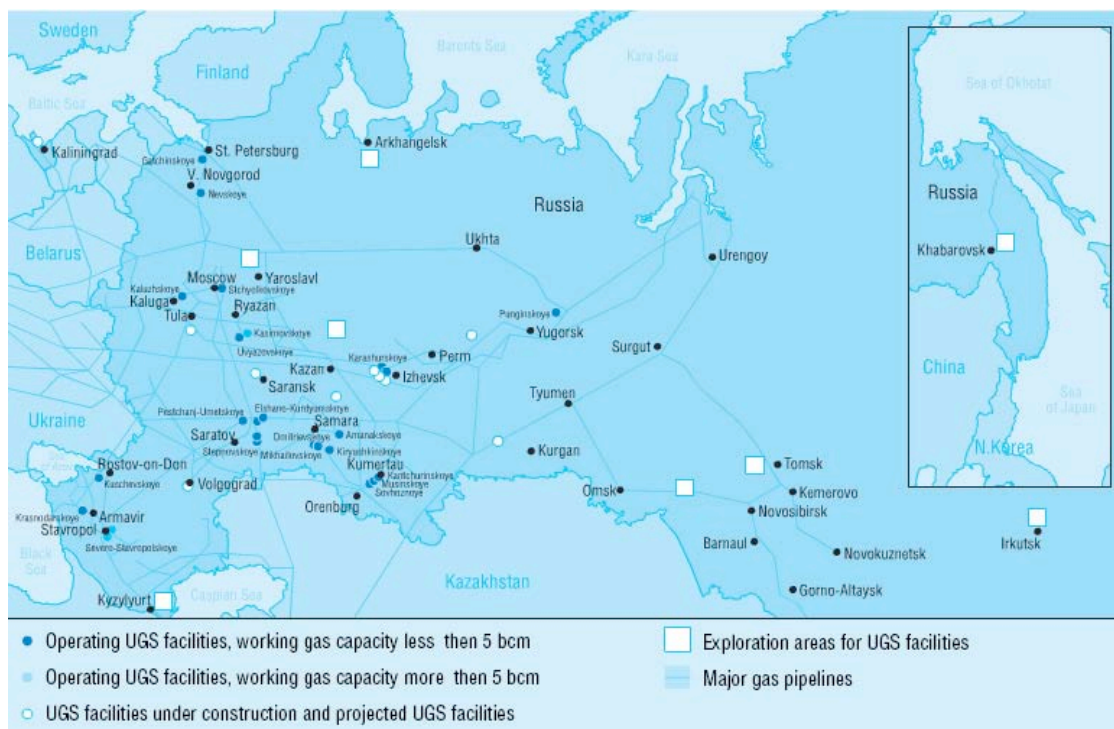
As of January 1, 2013, Russia’s 25 underground gas storage (UGS) facilities (17 in depleted gas fields and eight in aquifers) had a storage capacity of 66 bcm (Figure 16). Maximal daily storage output was registered on December 20, 2012, at 0.6707 bcm. During the period of peak load, the UGS facilities ensure about 20% of gas supply to Russian consumers and exports, and at times of quick freezes, this figure reaches 30%. During maximum gas withdrawal season in 2012/2013,

¹⁹ “Social and Economic Development Forecast in Russia for 2014–2016,” Ministry of Economic Development, September 2013.

the share of gas supplies from UGS facilities in Russia reached 38%. The Energy Strategy plans to increase the working UGS capacity up to 85 bcm by 2020 (and maximum daily output up to 1.050 bcm). Only Gazprom can own and operate UGS facilities. For the IGPs, there are no clear rules for storage access or any regulated tariff for their utilization.

It is planned that the UGSS will be further developed by connecting the new fields to the existing UGSS as well as gradual expansion to the east of Russia. It is expected that the length of the trunk gas pipeline system will be expanded by 25,000–27,000 km, including new export pipelines. In-service trunk gas pipelines, total length up to 20,000 km, will be rehabilitated and revamped. The South Stream and Power of Siberia will be priority export pipeline projects.

Figure 16. Russian Underground Storage Facilities



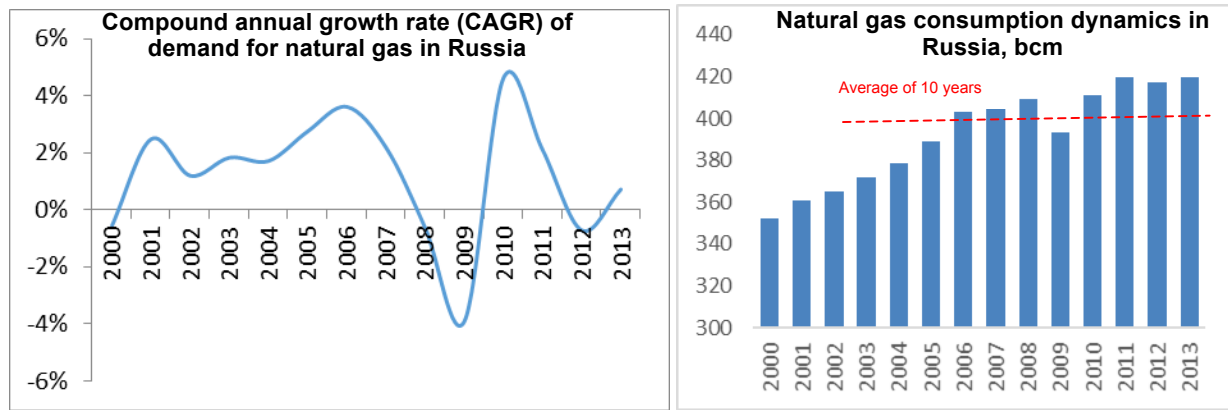
Source: Gazprom

Domestic Gas Consumption Trends

Russia is the world's second largest gas consumer after the United States, with 469 bcm of domestic gas demand in 2012. Historical data shows that over the last decade, gas consumption has been steadily and rapidly increasing at a pace of 2.3% per year during 2000–2007; this demand was related to the growth in power generation and in industrial consumption due to stronger industrial output. But a sharp deceleration in Russia's economic growth in the wake of the crisis (from 6–8% to 1–2% of annual GDP) put the brakes on the growth of demand for natural gas, causing actual gas consumption growth figures to be considerably below strategic targets. Domestic consumption of natural gas, which demonstrated steady growth outpacing that of GDP before the crisis, had almost ceased to grow in the recent years ridden by ramification of the crisis and price growth (Figure 17).

The basis of domestic gas consumption comes from gas utilization for energy needs (in power generation and in centralized boiler houses), meaning that demand in these sectors is sensitive to movements in GDP. About 45% of Russia's gas consumption (190 bcm in 2012) comes from the power sector, to supply Russia's large fleet of thermal power plants and 16% comes from centralized heat production (68 bcm). Industry accounts for 18% of total demand, with natural gas mainly used in chemical and iron and steel industries. Utilities and households represent another 18% of demand. The gas transmission system consumes about 45–50 bcm of gas per year for its own needs (first of all, to fuel compressor stations). Gas use in the transportation sector is very limited so far.

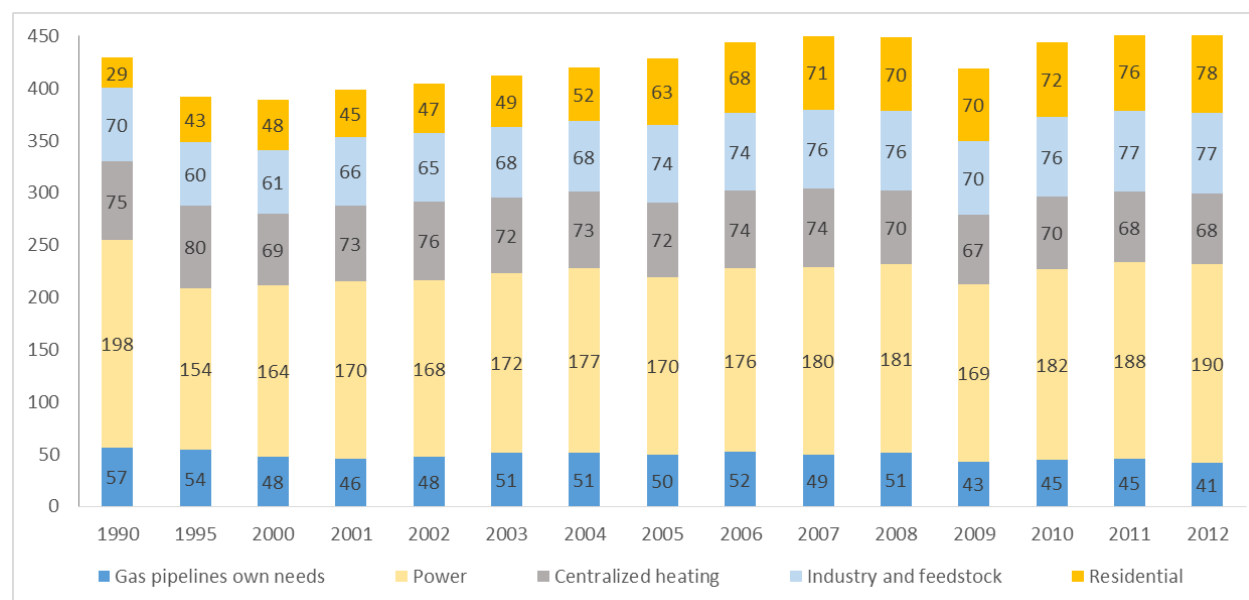
Figure 17. Natural Gas Consumption Dynamics in Russia



Sources: Federal State Statistics Service, ERI RAS

It has to be noted that deceleration in natural gas consumption growth is observed in all sectors of the domestic market. Moreover, in the sector of centralized heating, there is even a reduction in the absolute consumption volumes of natural gas (Figure 18). Electrical power generation and industry were the main drivers of demand for natural gas in the last decade, but in the wake of the crisis and overall economic slowdown, these sectors have been most severely affected. In recent years, the growth of demand for natural gas has been mostly confined to four regional markets (the oil industry in the Tyumen region and Sakhalin, and the power industry in the Moscow region and St. Petersburg), without which the growth of demand for natural gas in Russia as a whole would have been only a third of its actual figure, i.e., only 0.4% per year in 2004–2011. The most severe deceleration of demand growth for natural gas has been observed in the Urals, Volga region, and southern Russia—the largest industrially developed regions.

Figure 18. Structure of Domestic Demand for Natural Gas in Russia (bcm)

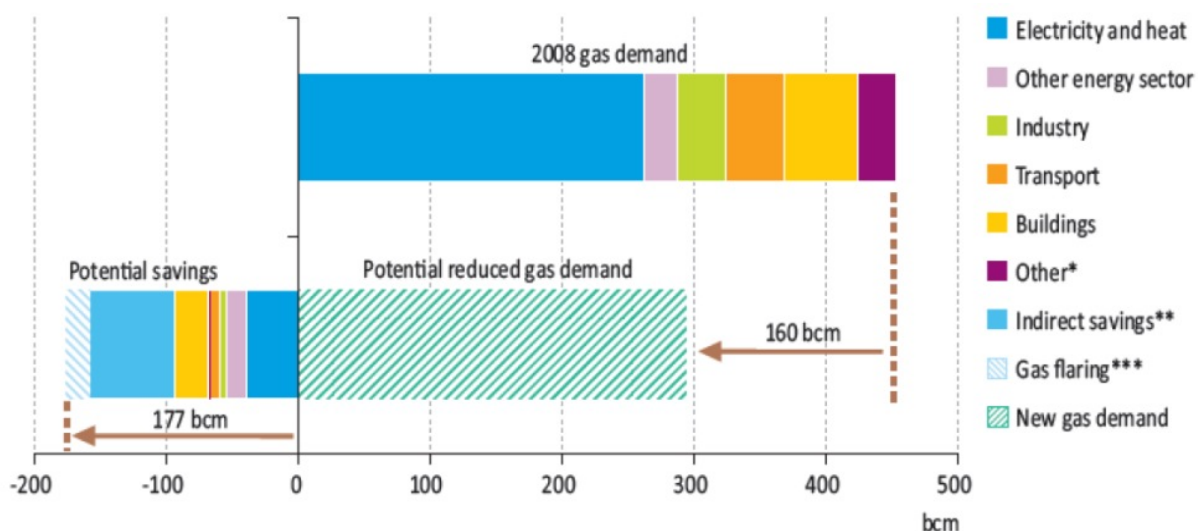


Sources: Federal State Statistics Service, ERI RAS

There is a huge, untapped gas-saving potential in Russia: according to the International Energy Agency estimate, with the application of OECD (Organisation for Economic Co-operation and Development) conventional technologies, Russia could save about 180 bcm per year (Figure 19). It is apparent that all this potential cannot be utilized. It would necessitate the replacement of all

fixed assets; however, even partial application of these technologies could significantly impact the volume of gas demand.

Figure 19. Russian Gas-Saving Potential Structure (bcm)



*Includes agriculture and non-energy use.

**Indirect savings reflect the additional decrease in primary gas use that accompanies savings in final consumption.

***Gas flaring, a non-productive use of gas, is not a component of gas demand and therefore reductions in this area are reflected only in the total potential savings.

Source: World Energy Outlook 2011, International Energy Agency

Gas Market Institutional Framework and Access to the Pipeline System

Russia's gas sector has some structural and institutional specifics inherited from the Soviet command economy. Starting from 1990s, when the gas ministry was turned into Gazprom, its institutional structure was did not change considerably. In 1999, Gazprom was defined the single owner and operator of the UGSS under the law "On Gas Supply in the Russian Federation."²⁰ This law required Gazprom to supply prenegotiated volumes of gas to customers at regulated prices, regardless of profitability. Additional gas could be purchased from Gazprom or IGP's at higher prices. The whole gas sector was politically defined as a "natural monopoly," although the law stipulated that gas transmission and distribution network owners are obliged to allow independents to access its systems, on the conditions that there is free capacity available, and that

²⁰ The Federal Law of the Russian Federation from March 31, 1999, No. 69-FZ, "On gas supply in the Russian Federation."

such companies hold gas production licenses, have contracts with customers for their gas, and ensure that their gas meets specific technology standards.²¹ This situation reflects the limits to third-party access, since Gazprom can refuse transportation services for technical reasons and prioritize its own supplies. There is no disclosure of flows on a daily and weekly basis, only on a monthly or quarterly basis, thus limiting the transparency of the system. Contracts over transmission are usually of one year, but not very flexible. Some stakeholders complain that it takes too much time to conclude them—up to two months.

In the early 2000s, the role of IGPs was negligible. Some of the vertically integrated oil companies attempted to commercialize their gas production, but since Gazprom controlled access to the transportation system, they did not succeed. Some, such as Lukoil, ended up selling gas to Gazprom at the wellhead, while others, such as TNK-BP and Surgutneftegaz, used most of their associated gas for their own needs. Gazprom's dominance was unquestionable. The access of IGPs to Gazprom's pipeline system was a huge problem in the 1990s and early 2000s, but with the economic crisis and UGSS expansion capacity, constraints were mainly removed. Since 2009, the Federal Antimonopoly Service has been working to enforce the legislation and prevent unfair treatment. In 2012, gas transportation services via UGSS were provided to 25 independent companies.²² IGPs' main complaints are no longer concerning the pipeline access—mainly about transparency and tariffs instead.

In 2002–2005, there was a huge campaign for gas market reform, and two dozen competing “market concepts” were prepared. But in 2006, a very clear signal came from the president that these discussions should be stopped, as Gazprom's strategic and geopolitical role had to take precedence over all commercial arguments. Since 2006, new legislative initiatives have included the encoding in law of the gas export monopoly, and the consolidation of the state's majority ownership of Gazprom.²³

²¹ Regulation “On the Provisions for Access of Independent Enterprises to the Gas Transportation System of JSC Gazprom” approved by the Resolution No. 858 of the RF Government, July 14, 1997.

²² Gazprom 2012 Annual Report.

²³ A. Belyi, “Trends of Russia's Gas Sector Regulation,” presented at the Fourth Annual Conference on Competition and Regulation in Network Industries, Brussels, November 25, 2011.

Discussions of market liberalization started again only recently, and much more modestly. In fact, the government is not developing any regulatory framework to unbundle Gazprom, which means—bearing in mind the long period of time that would be needed to implement such a regulation—that liberalization is not on the agenda for at least the next few years. The government is frightened by the prospect of something going wrong during the transitional period—these fears are understandable, given the huge economic and political role of gas.

However, falling export volumes and revenues in 2009 were very disappointing for the government, and it realized that Gazprom needed incentives in order to improve its efficiency. There was already, in Novatek, a candidate to play the role of a competitor. With the acquisition of a shareholding by Gennady Timchenko, founder of the oil trader Gunvor and a friend of President Putin, Novatek gained strong administrative resources and lobbying power. It then started its crusade for the market share. In 2012–13, another new player came to the market, Rosneft. After leaving the position of vice president responsible for the energy sector in the government in May 2012, Igor Sechin returned to Rosneft and immediately started developing its gas business, recruiting senior managers from Gazprom and launching ambitious projects. So, after a decade of steady increases in the roles of non-Gazprom producers, a real breakthrough occurred in the post-crisis period.

There is a clear trend of independents increasing their gas sales on the domestic market while Gazprom gas sales are decreasing. (Although Gazprom's revenues from gas sales to the domestic market have been constantly increasing, a large part of this increase went to pay higher MET taxes affecting the company.) Gazprom by law has to sell gas at regulated prices to industrial customers, while IGPs can sell gas at market-based prices. IGPs limit their sales to markets close to their production centers in order to reduce transportation distances and costs, so they tend to take dominant—if not monopolistic—positions in certain regions, thus simply replacing Gazprom. In distant and remote regions, Gazprom remains the sole monopoly supplier. The Russian wholesale market is step-by-step transforming from a monopoly to an oligopoly (Figure 20).

Rosneft and Novatek are competing more and more aggressively with Gazprom, proposing discounts to the regulated price. They were successful in cherry-picking Gazprom's best industrial customers. It seems nevertheless that a mechanism of "market division" and government control was applied—that is, the largest power generating companies and metallurgical plants could not simply change their suppliers without consulting with the government. The gas market structure is now more reminiscent of the oil industry, with its regional monopolies or oligopolies.

Figure 20. Market Share of Gas Producers in Some Regions



*in most Russian regions, Gazprom's share is 100%

Sources: Gazprom, Sberbank Investment Research

Non-Gazprom production is increasing, while market consolidation and concentration is taking place. After Rosneft acquisition's in 2013 of TNK-BP and Itera, there are just three large non-Gazprom producers left on the market: Novatek, Rosneft, and Lukoil. Rosneft, which has contracts to supply more gas than it is able to produce, apparently aims to become a "consolidator" of oil companies' gas output. There is now an oligopoly (and regional

monopolies), instead of the former monopoly. The government prefers this, and is applying the good old “system of blocks and checks” and “division of markets” between groups of interest.

In the next few years, competition on the domestic market will increase. A large number of power sector and industrial consumers renewed their five-year contracts in 2012–13, and the greater part of industrial customers now have contracts. Further changes in market shares are likely to happen through sales to residential and smaller business customers, which is much more complicated and considerably less profitable.

According to already-signed contracts, Rosneft has committed to supply 34 bcm of gas in 2013 and 2014, 37 bcm in 2015, 72 bcm in 2016, and 77 bcm in 2017. Rosneft announced it already has contracts in place to supply over 70 bcm. The company has also set a long-term goal to increase its commercial gas production to 100 bcm by 2020—so that when discounting potential production from Itera and from TNK-BP, Rosneft would add about 40 bcm of its own production by 2020. As an illustration, in 2012 Rosneft signed a landmark gas sales contract with InterRAO to supply up to 875 bcm of gas from 2016 to 2040 (equivalent to up to 35 bcm per year), with intentions to increase sales to the power sector. Novatek in turn is confident that it will market 67 bcm by 2017.

Rosneft and Novatek are already moving to the regions: in Chelyabinsk, Sverdlovsk, and Kostroma, they are the dominant suppliers, not Gazprom. But the regulatory framework is still designed only for Gazprom, and there is a huge legal “gray zone.” The gas distribution business operates in a regulatory vacuum—there are complicated schemes of ownership and operation, many vested interests are at play, and gas supply chains are configured in numerous ways. Here the independent companies will have to deal increasingly with non-payments and the consequences of the communal sector reform. How regional monopolies will be regulated is still unclear, but there are already signals from the government that dominant regional suppliers will be made responsible for regional gasification programs and gas distribution infrastructure development.

There were attempts to develop spot trade in Russia—the Gas Trading Floor was functioning in 2006–2008. This was an experiment “with the aim of practicing modern exchange technologies.” The experiment envisioned the sale of natural gas at free market prices at the electronic trading facility (ETF) of Gazprom’s sales division, PLC Gazprom Mezhhregiongaz. Within the framework of this experiment, Gazprom was permitted to sell up to 5 bcm of natural gas at free market prices in 2007. Simultaneously, non-Gazprom gas producers could sell a similar amount of natural gas at free market prices. In 2008, Gazprom and non-Gazprom producers were allowed to sell 7.5 bcm each at the ETF. A total of 6.1 bcm of natural gas was sold at the ETF in 2008, including 3.1 bcm by Gazprom and 3 bcm by non-Gazprom gas producers. Most of the gas sold via the ETF was purchased by power generation companies (86%). With the expiration of the term of the experiment, ETF trade was terminated as of January 1, 2009. Since then, Gazprom and the government have been futilely discussing new principles of exchange trade in natural gas. As things stand today, a draft resolution “On the sale of natural gas using exchange trade technologies” has been submitted to the Russian government. It is designed to facilitate the transition from the experimental sale of gas at non-regulated prices, using exchange technologies in such sales on a permanent basis. Obviously, the idea has been lobbied mostly by the exchanges, namely the St. Petersburg International Mercantile Exchange, the Inter-Regional Oil and Gas Complex Exchange, and Gazprombank. Gas companies view the idea without much enthusiasm. After all, they understand that in the situation of a superfluous supply of natural gas, spot trading is likely to push the price down (which will serve as an additional argument for the government to freeze the price for a longer period). On the other hand, industrial consumers are no longer facing gas limits and are able to satisfy their short-term needs from the available long-term contracts. Therefore, they are also not very interested in exchange trade in natural gas.

Gas Taxation in the Russian Federation

Taxes for the Russian gas industry include: standard taxes (VAT, corporate income tax), Mineral Extraction Tax (MET), subsurface use tax,²⁴ and export duty.²⁵ Traditionally, in the low-

²⁴ According to the Federal Law “On Subsurface Resources,” Clause 39, Subsurface Use Tax includes single payments for subsurface use in certain circumstances specified in the license, regular payments for subsurface use, and dues for taking part in a tender (public sale). The payment amounts are fixed in accordance with the provisions of the license.

²⁵ According to the Decree No. 754 adopted by the Government of the Russian Federation on August 30, 2013, export duty of 30% on natural gas export outside the Customs Union (Russia, Belarus, and Kazakhstan) is paid on

regulated gas price environment, the state's tax take from the gas industry was much lower than from the oil industry, with the export tax being no higher than 30% and the MET being about one-tenth of that for oil on an energy equivalent basis. However, with the recent gas price increases, the situation is changing: facing a budget deficit, in 2011 the government initiated significant increases in the MET for gas, aiming to take back most of the benefit of price growth through taxes. It became a subject of heated discussion in the government and one of the key issues for Russian gas producers, one that defined their future profitability.

As of January 2014, it has been decided to levy MET at gradually rising levels, narrowing the difference between the rates for Gazprom and for independent producers, and to provide zero MET for associated gas; gas pumped into the reservoir in the course of condensate recovery and for gas fields in Yamal peninsula used solely for producing LNG. According to the MET formula adopted on September 30, 2013,²⁶ this tax rate will depend on more than a dozen parameters—the oil price, oil export duty rate, currency exchange rates, gas price for the domestic (with reference to netback parity) and export markets, transportation costs, the amount of gas supplied on the domestic market and abroad, geographic position, level of gas reservoir depth and depletion, and other parameters. So far, it is not clear how companies will calculate all this data or how the tax authorities will control it. Moreover, it should be noted that hardly a month passed after the adoption of the new MET schedule when the government started discussing possible amendments to the formula.

The government has provided a number of fiscal incentives to foster exploration activities in the offshore Arctic, including: unlimited MET exemptions, export tax exemption (yet limited in time, for example, on 250 bcm of gas for the Yamal LNG project, and up until 2042 for Arctic resources), property tax, and amortisation holidays.

the realized export price. Exemptions are currently in place for gas exported via the Blue Stream pipeline across the Black Sea to Turkey, some gas exports to neighboring countries, and, thus far, for all LNG export projects.

²⁶ Federal Act 263 dated September 30, 2013; "Gosduma smeshala nef't's gazom," *Kommersant*, September 23, 2013.

Domestic Gas Pricing in Russia

Back in the Soviet era, domestic fuel prices were calculated on the basis of production costs, and were often insufficient for the producers to provide any margin—the basic concept of the Soviet era pricing was to set prices on the level of the average, not the marginal, costs. This approach was based on the idea that each individual industry was part of a large common enterprise—the national economy. As a result, domestic fuel prices were only a small fraction of the corresponding world market prices. With the market reforms in early 1990s in the oil industry, which was most strongly integrated with external markets, domestic prices were liberalized. Free market pricing also prevailed in the coal industry. The situation was different in the gas industry, where prices are still regulated by the state.

In 1991–2001, the government pursued the policy of purposeful containment of domestic gas prices in order to maintain social stability and the competitiveness of Russian industries. Given Gazprom's unique position as the owner of the UGSS and the dominant market participant (at that time, it accounted for up to 90% of the country's gas output), the government, seeking to balance the economic interests of all gas market players, began to exercise²⁷ direct influence by regulating:

- Wholesale gas prices for industrial consumers and for distribution to the population at the connection points of gas distribution networks with trunk pipelines²⁸
- Charges for natural gas transmission via trunk pipelines and distribution pipelines²⁹
- Special surcharges for gas transmission via gas distribution networks to collect money for funding regional gasification programs (special surcharge)
- Charges for distribution and logistical support services
- Retail prices for gas charged from industrial consumers and from household utility providers

²⁷ Under the Main Regulations of Pricing and State price regulation for gas and tariffs on services for gas transportation across the territory of the Russian Federation approved by the Resolution of the RF Government dated December 29, 2000, No. 1021.

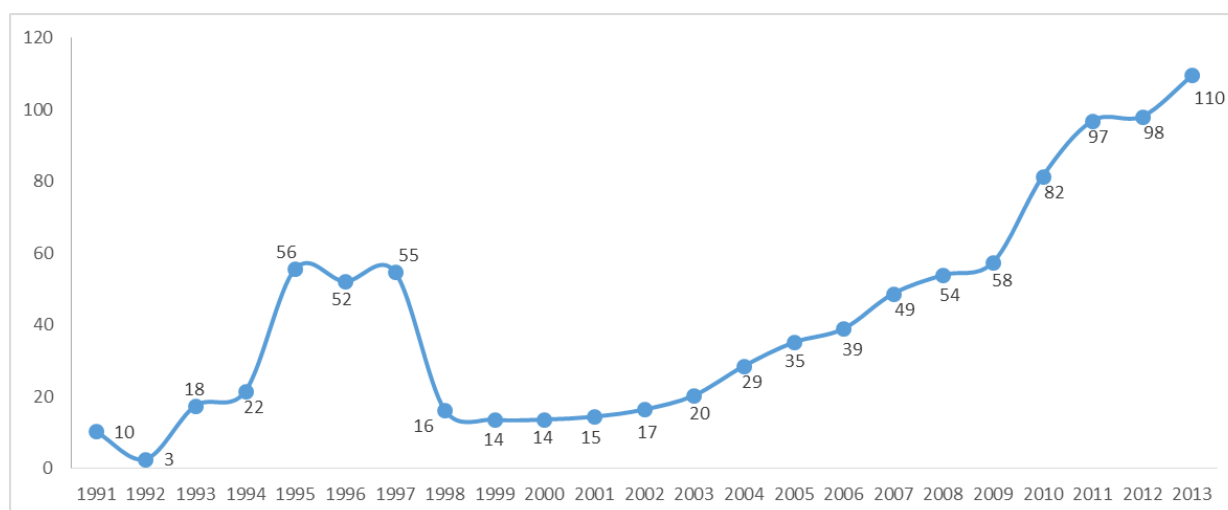
²⁸ Dependent on a group of consumption, it ranges from 75% to 90% of a final price.

²⁹ Under legislation, gas transportation through trunk lines and distribution grids as a natural monopoly is subject to special state regulation.

From the very beginning, Russian laws and government regulations determined that natural gas produced by Gazprom and its affiliates should be sold to domestic consumers at government-regulated prices. Non-Gazprom gas producers may sell their gas to industrial consumers at negotiable prices.

A government resolution dated July 13, 1993, “On the state regulation of prices for natural gas, and other energy resources,” established that beginning on July 20, 1993, the wholesale average price of natural gas for industrial consumers should be equal to 7,900 non-denominated rubles per one thousand cubic meters and the trader premium should be 1,100 rubles per one thousand cubic meters. The price was subject to monthly indexation based on the industrial average price index for the previous month. Therefore, instead of the “cost plus” principle established under the law “On natural monopolies,” the “cap price” approach became the de facto standard. The cap price was based on macroeconomic considerations (to curb inflation, etc.) with obviously insufficient attention to the gas industry’s development needs. Responding to the task of curbing inflation, on October 13, 1995, the government issued a resolution to freeze wholesale prices of natural gas until the end of 2000. Price vacillations of 1994–1998 (Figure 21) only reflected the changes of the ruble exchange rate.

Figure 21. Dynamics of Weighted Average Wholesale* Prices of Natural Gas for Industrial Consumers on the Domestic Market, 1991–2013 (\$/mcm)



* Not including VAT and the gas distribution surcharge

Sources: Gazprom, Federal State Statistics Service, ERI RAS

As a result, artificially low prices formed on the domestic gas market, which were not sufficient for the gas industry's development, including the investment component. Another result was a strong disparity between the domestic gas price and the price of oil and substitute fuels, such as fuel oil and coal.³⁰ This pricing policy stimulated consumers into maximum use of gas, making gas saving unattractive. In combination with chronic underinvestment of the gas industry during the transition period, this began to create the serious risk of a gas deficit and ultimately prompted the government into revising their pricing policy.

In 2002, in a situation of heightened demand and a looming gas deficit, the government decided to cancel the price freeze and started applying the "cap price" approach in combination with high indexation of prices (20–25% per annum) in order to stimulate investment and energy saving.³¹ However, these moves proved insufficient: the gas deficit in the domestic market was becoming more and more likely, and the gas quotas set for industrial consumers began to slow down industrial growth. Moreover, under the agreements reached with the EU on Russia's accession to the World Trade Organization, gas prices on the domestic market were to be increased to a level where they could fully cover all costs of the gas producing companies, including the investment component needed for the industry's development.

In late 2006, a strategic decision was made in favor of outpacing growth of domestic gas prices to ensure a phased transition to export netback levels, i.e., equal profitability of supplying gas to the domestic market and for exports.³² In May 2007, the Russian government adopted Resolution No. 333, which legalized the export netback approach to domestic gas prices³³ and ensured gas price growth on the domestic market on the annual level of 15–25% until it could reach netback level (by 2011, as estimated at the time).

³⁰ In 1999, coal, gas, and fuel oil relationship in Russia was at a level of: 1, 0.5, and 2.8, respectively. At this date, in the West European countries, coal, gas, and fuel oil relationship was at a level of: 1, 1.6, 1.7.

³¹ A. A. Makarov, V.A. Malakhov, and T.A. Mitrova, "Natural gas effective prices in Russia: Russian power generation in XXI century," ISEM, Irkutsk, 2005.

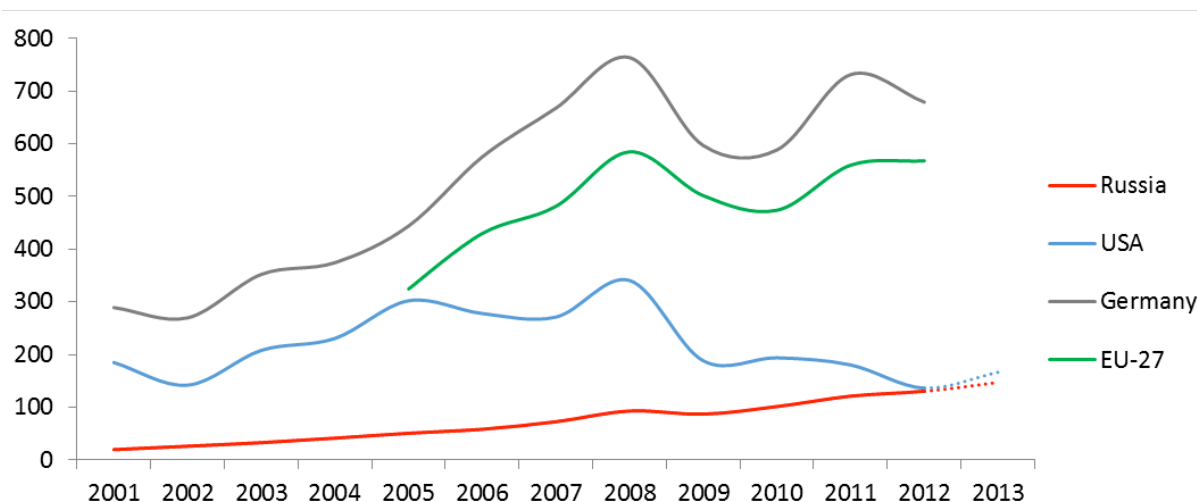
³² Export price with duty, transportation, and other costs relating to storage and gas sale deducted is the equal netback price for Russia.

³³ Under Resolution No. 333, a number of steps had to be taken to change pricing in the gas industry. In particular, Gazprom was entitled to deliver gas to specific customer category by negotiated prices, meanwhile the FTS regulates maximum prices. In 2011, these maximum prices were 10% against a level of regulated price. Gazprom had no right to sell gas lower than these prices.

Natural gas prices for industrial consumers³⁴ in Russia increased by more than five times over the past 10 years, but still failed to reach the export netback target due to the radical changes that have taken place in the global oil market. In 2006–2007, when the decision to move domestic gas prices to the export netback was made, oil prices were on the level of \$60 per barrel and export netback prices for natural gas for central Russia were estimated at around \$120/mcm—and this level was indeed reached by 2011–2012. But oil prices had nearly doubled, and, consequently, export netback prices for natural gas turned out to be much higher than initially planned—\$220 to \$240 per per barrel. In 2010, the target date was postponed to 2014.

In 2012, the Ministry of Economy and the Federal Tariff Service announced further postponement until 2015–2018 (at the same time maintaining price indexation at 15% per annum). But in 2013, negative processes—such as deceleration of GDP growth, industrial production, and fixed investments—became dominant. The government now has to answer the question whether it is advisable in such a situation to continue the policy of accelerated increase of domestic prices for natural gas. Retail prices of natural gas for industrial consumers in Russia are already higher than in the United States, though still noticeably lower than in Europe, dependent on gas imports (Figure 23), which is arousing discontent among Russian industrial gas consumers. Some of them (for example, one of the largest chemical producers, Evrochim) announced that they will build their new plants not in Russia, but in the US. Industrial consumers stress the need to preserve the competitiveness of the Russian industry and the fact that the increases in regulated wholesale price levels already allowed Gazprom and independents to make good profits.

³⁴ Regulated prices for the population are still set well below the wholesale industrial gas price, as providing affordable gas to the population is key for the government's social policy. The Federal Tariff Service sets a framework with minimal and maximal tariffs and Regional Energy Commissions then determine the regional retail gas price, which varies depending on the category of households and the presence or absence of metering. The wholesale prices of gas for households will be rising in line with the industrial prices, but will remain much lower for the foreseeable future.

Figure 23. Dynamics of Industrial Final Gas Prices* in Russia, the EU, and the US (\$/mcm)

* Prices include taxes

Note: Calorific value of natural gas in the EU is assumed to be equal to 37 MJ/m³. Exchange rates used are those of the European Central Bank and the Central Bank of the Russian Federation.

Sources: Federal State Statistics Service, EIA US DOE, Eurostat

In the fall of 2013, the Russian government finally decided to freeze gas prices for 2014. The new Forecast of Socio-Economic Development of Russia for 2014–2016, prepared by the Ministry of Economic Development in November 2013, envisions much slower dynamics of wholesale prices for natural gas (2.2–7.6% per annum). Most likely, another revision will be made before or in 2016 while debates on price reform continue in the government.

Given the underdeveloped state of the Russian natural gas market and the presence of a dominant supplier who owns the UGSS, the formation of market prices appears impossible here in the foreseeable future: for the market to be liquid and the indicators to be objective, the market's volume and the number of its participants should be large enough. As a result, most of the market participants agree that governmental price regulation should be preserved in some form. The main disagreements concern the form the government should choose to exercise price regulation on the market.

The main unwritten code of price regulation by the government is to ensure a balance of interests of all the market participants. Without a doubt, at any given moment there is an imbalance in

favor of one of the groups, but overall the government is trying to respect all stakeholders. On the one hand, a maximum gas price cannot be higher than the price of inter-fuel competition. Should the price of gas appear to be higher than this value, it will not be competitive against other types of fuel and its market will be lost, since customers will switch to cheaper types of fuel. On the other hand, domestic fuel prices have to completely cover all costs relating to gas production and its delivery to customers, including gas industry development investments—which means that minimum gas prices cannot be lower than break-even prices of the marginal fields. As calculations by the Energy Research Institute of the Russian Academy of Sciences (ERI RAS) show, the European netback price (calculated based on average weighted European prices, not based on Gazprom’s contract prices) seems to be a mutually acceptable compromise. In this case, price signals would be transmitted from the large, highly competitive, and liquid European market. It would determine a configuration of marginally cost-effective gas and coal fields for thermal power plants as well as applicable equity value of nuclear technologies, and also ensure the economically accurate estimate of domestic gas demand and supply as well as development of effective upstream and midstream gas projects.

The currently proposed concept is to employ the “cap price” approach to achieve a smooth transition³⁵ to this European netback price level. Given the forecast reduction of European market gas prices (and, consequently, a reduction of the calculated netback price), it will be possible to bring domestic gas prices to European netback levels by 2025–2027 by increasing domestic gas prices at a rate equal to the rate of “inflation + 1%.” Of course, there is no guarantee that the government will choose this “trade-off” path, but such a trade-off is likely to be reached during difficult talks with all market participants. At any rate, it is this trade-off path that has been assumed in the draft of the new Energy Strategy of Russian Federation up to 2035 being prepared in the Ministry of Energy.

³⁵ Within possible short period without difference in growth rate of gas price during transition period and after reaching competitive prices.

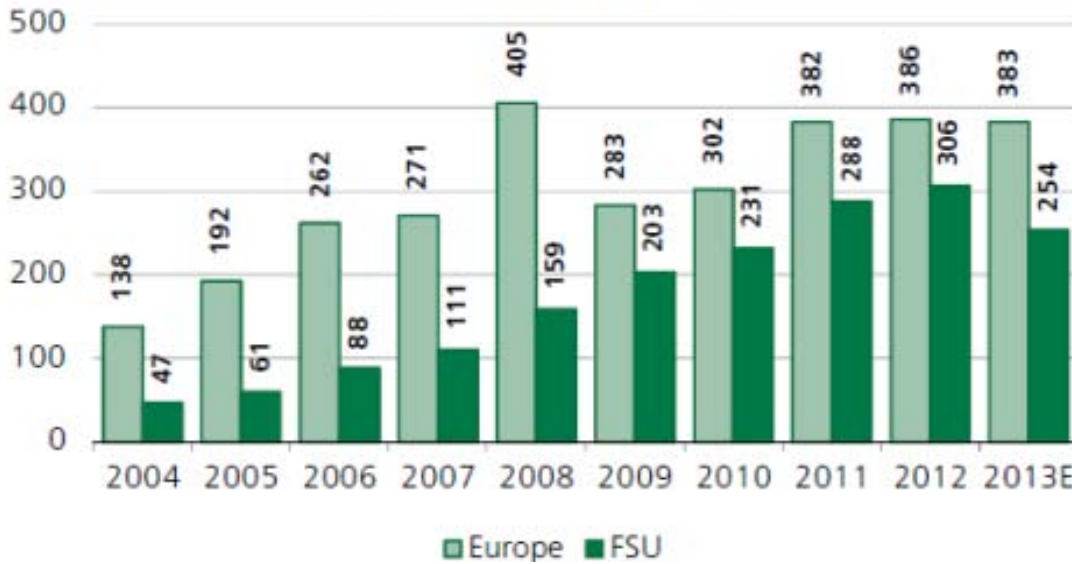
International Gas Trade

Gas Exports

There is a special regulation regarding the export of natural gas in Russia. Before 2006, Gazprom enjoyed a de facto monopoly over gas exports. In 2006, Federal Law No. 117 “On Gas Exports” from July 18, 2006, provided Gazprom with a monopoly over pipeline gas exports. As growth potential and profitability on the domestic market are limited, both Novatek and Rosneft are keen to get access to export markets. Obviously, the pipeline export monopoly is a “sacred cow” that the government is not ready to remove in any case, so the independents have focused their appetites on LNG projects, principally Yamal LNG (Novatek) and Sakhalin 1 (Rosneft and Exxon Mobil).

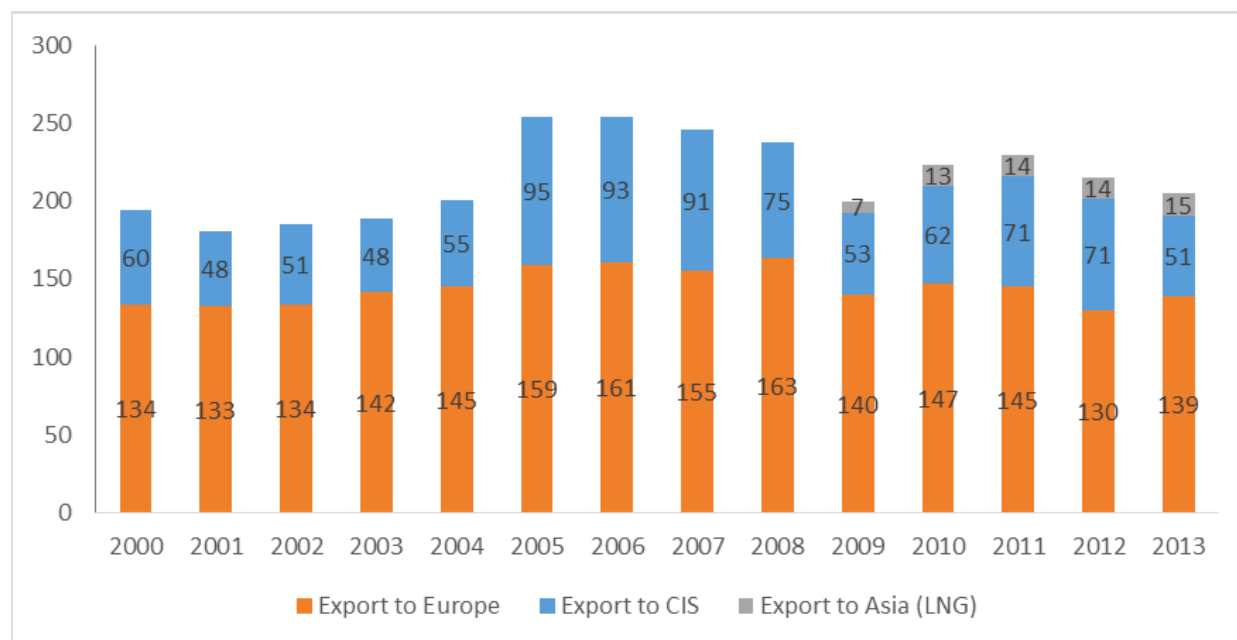
In November 2012, Novatek first proposed that LNG supplies be excluded from Gazprom’s export monopoly, on the grounds that this would help develop LNG projects and secure a strong position for Russia in the global LNG trade. The responsible government bodies indicated their approval, and in December 2013, the government approved amendments to the law on gas export drafted by the energy ministry. Though this law is far from a real LNG export liberalization, since it poses strict requirements for the companies and projects able to export, it is nevertheless an important step toward more liberal market conditions.

Russia exports nearly 30% of its gas production, with the largest markets in Ukraine, Germany, Turkey, and Belarus. In 2013, Russia exported a total of 217.7 bcm of gas. Russian gas exports to Europe have reached 139 bcm, but still have not returned to the pre-crisis level. This resulted from issues related to the competitiveness of oil-indexed gas prices against the backdrop of competition from alternative fuels, especially renewables and coal for power generation and alternative gas supplies, as well as consequences of the economic recession. In coordination with the government, Gazprom so far has stuck to oil-indexation while making retroactive payments to customers following price renegotiation or arbitration procedures, preferring prices over volumes strategy (Figure 24). The main rationale is the need to cover future higher production and transportation costs from the new upstream and midstream projects, as well as to cover the high taxes on extraction while still making a reasonable profit margin.

Figure 24. Gazprom's Realized Prices in Europe and FSU (\$/1000 cubic meters)

Sources: Gazprom, Sberbank Investment Research

Exports to the CIS declined to 51 bcm (a drop of 13.6%) and remained nearly stable for Sakhalin LNG export (14.5 bcm). Export is no longer an alternative to domestic demand, since the stagnant markets of Europe and the CIS are not ready to absorb any significant extra amounts of Russian gas at the prices linked to oil product prices. Gazprom, which holds a monopoly on pipeline gas exports, has chosen the strategy of maximizing prices, not volumes, and as a result there is virtually no opportunity for significant increase of natural gas exports from Russia, and Gazprom has not restored its pre-crisis export volumes even in relatively successful 2013 (Figure 25).

Figure 25. Russian Gas Exports Dynamics (bcm)

Sources: Federal State Statistics Service, ERI RAS

The situation could not even be helped by Russia's plunge into the global LNG market in 2009 with an LNG plant in Sakhalin (Russia LNG supplies to the Asia-Pacific Region increased from zero to 14.5 bcm in 2013) and the launch of a new export route to Europe, the Nord Stream gas pipeline (currently operating at less than 30% of its projected capacity).

European Pipeline Exports

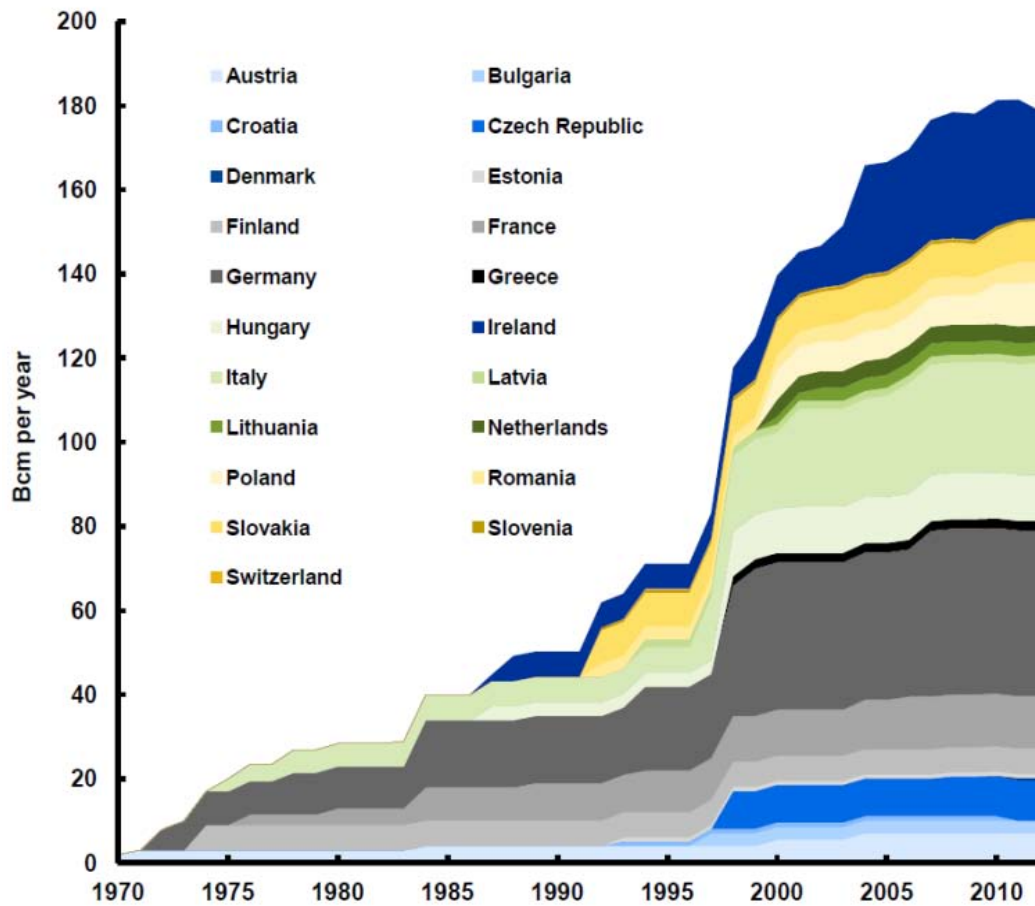
Russian export strategy in the European gas market was largely inherited from the Soviet Union. It was based on the following premises:

- Expectations of stable gas demand growth in Europe.
- The USSR, and later Russia, had all but the cheapest gas in the market and was interested in maximizing export volume, not price (given the serious deficit of hard currency, the country strove to increase the export of gas to Europe to the maximum, and not infrequently resorted to dumping in order to enter new markets).
- There were only a few competing suppliers in the European market, and market areas were clearly divided among them (Algeria for all practical purposes controlled Southern

Europe, Norway controlled the Northwest and Russia controlled Central and Eastern Europe).

- Gas supplies were made solely on the basis of oil-linked, long-term contracts with “take-or-pay” conditions (Figure 26).
- The contracts arranged for the delivery of gas only up to the national borders of European countries. These bilateral contracts were usually supported by intergovernmental agreements, and they were the only real legal basis for the regulation of deliveries.

Figure 26. Russian Gas Export Contracts for Supplies to European Countries, 2005–2012



Source: CERA

Beginning in 2002, after the appointment of new management at Gazprom, headed by Miller, this “traditional” strategy was supplemented with new features. First, irreconcilable conflicts in relations with Ukraine and Belarus led to a halt in gas supplies to European countries, giving the

appearance of bypassing strategies (Nord and South Streams). Second, with Gazprom concentrated on maximizing export income, the government obliged the company to increase value added on gas being sold, so the “downstream movement” strategy and gaining access to end users in European countries were announced. Gazprom started globalizing its activities, developing a large number of joint ventures, and the company got involved in searching for European storage, transport, and distribution assets.

From the beginning of the new century, Russia continued increasing its export volume and presence in the European market. However, the global economic crisis that began in 2008 heralded a serious decrease in Russian supplies. It revealed and intensified a distinctive “phase transition” in the European gas market. All fundamental factors underwent a transformation: demand, supply, pricing, and parallel drastic changes in market regulation. Moreover, these changes, given the political, economic, and ecological context, will only intensify over the next decade. These changes create an entire spectrum of threats to the traditional Russian export strategy in the gas sector, undermining its basic premises. This strategy worked excellently for half a century, but now it must adapt to the new reality.

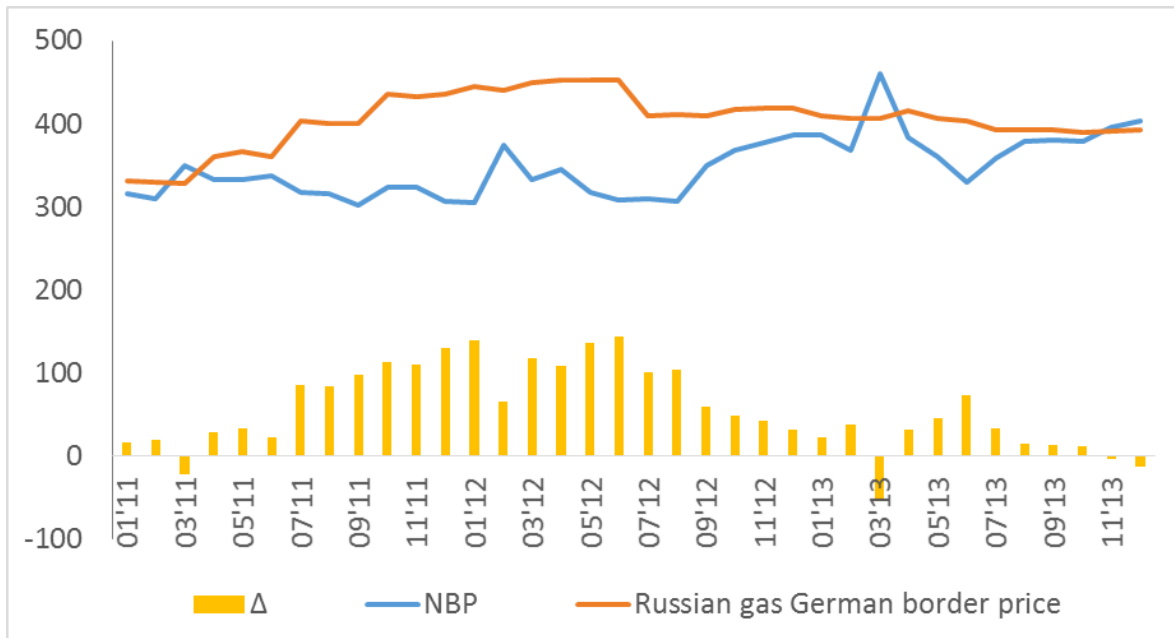
The market niche³⁶ in Europe continues to shrink compared with previous assessments. On the one hand, this is caused by the drop in demand, checked by the declining trend in domestic production; and on the other, the increase in volume of LNG supply and the growing competition with other pipeline gas suppliers. A niche for additional supply in the European market prior to 2017 simply does not exist: all demand is completely covered under existing long-term contracts. In this situation the task of maintaining—and especially increasing—the volume of Russian gas exports to Europe is not a simple matter. The situation is aggravated by the fact that Russian gas is becoming commercially and politically less attractive for Europe; Russian production and transport costs are growing significantly, making Russian gas less competitive in the stagnating European market. “Old” Russian reserves, which were the basis of domestic gas expansion, are already in a state of decline. However, “new” Russian gas, which will be produced in complex

³⁶ Market niche is the volume of uncontracted demand, determined as the difference between predicted demand and Annual Contracted Quantities (ACQ), the latter of which can be divided into two parts: 1) strict liability, or “take-or-pay” (TOP) on long-term contracts, which on the average in Europe comprises 75% of annual contract quantities (ACQ); and 2) liability under signed contracts above “take-or-pay” quantities (ACQ-TOP)—on average, 25% of annual contract quantities.

projects in Yamal and Shtokman, will have minimum profitability in the European market due to the extremely high production costs. The increase in transport costs to deliver the gas due to increases in Unified Gas Supply internal transport fees also worsens the competitiveness of Russian gas. And considering the traditional pricing system indexed to petroleum product costs that is favored by Gazprom, Russian gas is very nearly the highest priced for the buyer in the market.

Aside from this, political considerations have to be added to the purely economic ones. As gas (rightly or wrongly) is considered a tool of Russian foreign policy, there is strong opposition in many European countries to increasing its import. Halts in gas supply notably damaged the image of Gazprom and increased the desire among European users to lower their dependence on it. And so, all other things being equal, buyers are striving to minimize the import of Russian gas for political and commercial reasons.

Since 2009, Gazprom began receiving official notices from European buyers with requirements for contract review; according to Gazprom's official financial reports, it had already more than 200 price reviews with nearly all its buyers (many of them renegotiated contracts for several times). Mainly the customers were presented with discounts in the review of the base price formula P_0 and petroleum products coefficients. Spot component was introduced only in 2009 renegotiations and only for the over-take-or-pay volumes. Gazprom is still following the ideology of oil-indexation; though after all the price reviews, the price of gas on the Russian border turns out to be approximately 15–20% lower than in the “good old” oil-indexed contracts, and the gap with spot prices has nearly disappeared (Figure 27). This narrowing gap is also a result of disappearing gas glut and tightening supply-demand balance on the European gas market in the short to medium term.

Figure 27. European Spot and Oil-Linked Gas Prices (\$/mcm)

Source: Bloomberg

Hence, Gazprom's policy with regard to contract review is based on the principle of the maximum delay in presentation of the minimum discount acceptable to the buyer, under the terms of "special" bilateral agreements with various nation clients. Gazprom conducts negotiations on an individual basis, depending on the historical relationship and strategic significance of a given buyer; with many companies, Gazprom is not just concluding contracts, but also major joint projects and joint ventures in the downstream sector. Since the beginning of the crisis, the company has steadfastly followed a policy aimed at maximizing gas prices, but not market share, as was previously the case. And it must be noted that Gazprom's export revenues stabilized and returned to pre-crisis levels, as well as gas export volumes in 2013.

In the words of Alexander Medvedev, "We were faced with a choice: either to maintain volume and market share at whatever cost, or concentrate on maintaining revenue. As a public, profit-making enterprise, Gazprom OJSC is interested in increasing earnings, so as to ensure a profit for our shareholders. So the right choice was made—in favor of revenue, and the results support this. What's more, the system of long-term contracts with 'take-or-pay' conditions and the

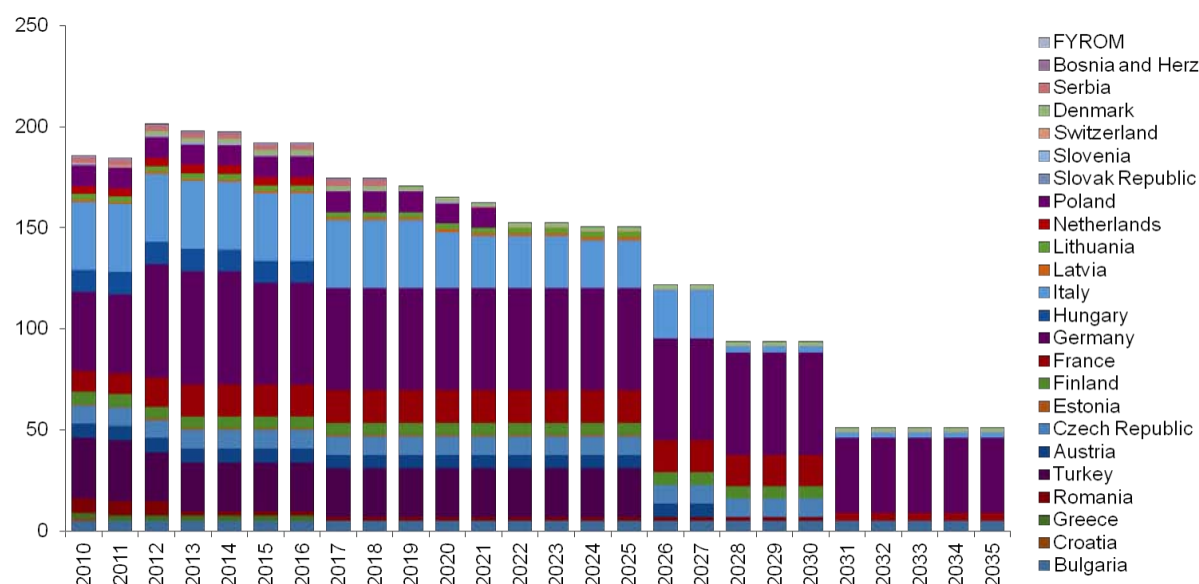
principle of pricing indexed to a basket of petroleum products, etc., were kept intact.”³⁷ According to Gazprom’s statements, the company does not reject the development of alternative pricing mechanisms, but it considers that there are substantive limitations on this development, as the price at trading platforms cannot yet be considered a reliable indicator.

In the medium term, Russia can choose between two strategies:

1. Post-adaptation by providing limited concessions to its buyers. In this way, Russia continues to staunchly refuse to move to spot pricing, if necessary by providing a discount that will be minimally acceptable to the buyer, or else maintaining their position on petroleum indexing in arbitration and even further reduction of delivery volume for the sake of maintaining their pricing principle. The following circumstances work in favor of this strategy:

- With higher prices, even lower export volume guarantees a growth in revenue.
- A surplus of gas on the worldwide LNG market is not expected for the next two to three years, and consequently pressure on the European market will not be strong.
- Gazprom’s major contracts do not expire until after 2022 (Figure 28); Gazprom has a huge portfolio of oil-linked, long-term contracts for supplies to Europe for the next 25 years and longer.
- The conflict can be somewhat mitigated by further individual concessions by Gazprom to their major buyers.

³⁷A. Medvedev, “Revenue is the Important Thing,” *Gazprom Magazine* No. 4, 2011.

Figure 28. Duration and Volume of Russian Contracts for Delivery of Gas to Europe (bcm)

Source: Cedigaz, ERI RAS

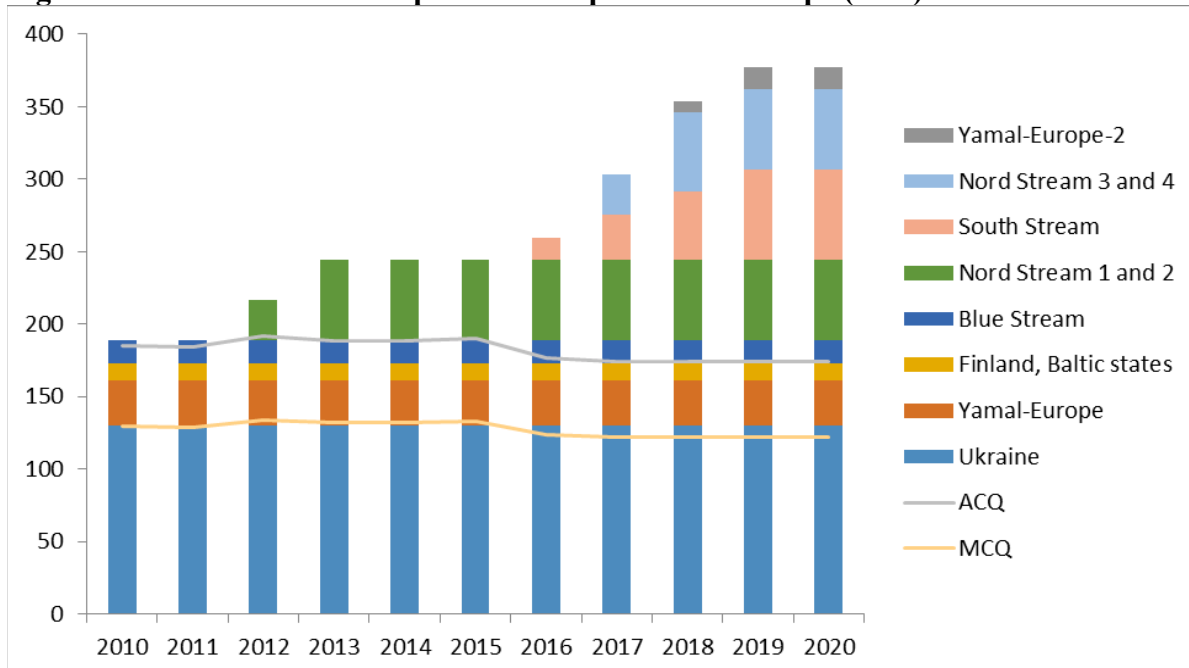
This may be more of a winning strategy in the mid-term perspective. However, it is important to understand that due to assigning priority to high prices, Russian export volume will hardly surpass 150–180 bcm before 2025. Based on these numbers, it's worth reviewing the investment program for the export pipelines expansion, which is huge with South Stream 63-bcm project, additional Nord Stream lines, and the potential Yamal-Europe expansion (Figure 29). If all the projects under consideration are implemented, the transportation capacity surplus by 2020 will reach 200–220 bcm (Figure 30).

Figure 29. Russia's Main Gas Export Pipelines to Europe



Sources: Gazprom, Sberbank Investment Research

Figure 30. Russian Gas Transportation Capacities to Europe (bcm)



Most importantly, market predictions for after 2016–2018 indicate the possibility of radical changes both in demand (a slowdown in response to high oil-indexed prices) and in new supplies (from North America, Australia, and other producers). At that point, the effort to maintain the traditional strategy at any cost may result in a substantial decrease in market share, delivery volume and export revenue in the sale of Russian gas to Europe.

2. The alternative is a strategy of anticipatory adaptation, by providing a gradual, “managed” approach to spot pricing. Russia can agree with buyers to a “buy-out” of long-term contracts and then set up simultaneous price and volume optimization, depending on current market conditions. In this case, in order to maintain their market position, Gazprom has to agree to prices that will ensure the competitiveness of their gas in the electric utilities market and greater flexibility in supplies. Then the major catch in the development strategy for the branch should be addressing loss of control in the production and transport of gas, as well as in connection with the additional risks arising from new, expensive pipeline projects, addressing state stimulus and support for them. It is quite possible that it would be advisable to abandon any part of the projects that cannot be paid off at this price level.

This option is fraught with higher volatility; however, it has the following advantages:

- The possibility of profitably “trading off” changes to contractual terms in exchange for financial compensation (as was done in the review of contracts in the UK in the deregulation period).
- The possibility of receiving necessary dispensations for Russian infrastructural mega-projects and perhaps even support from European financial institutions.
- More favorable conditions for obtaining assets downstream (such as in gas generation).
- An increase in Russian export volumes and European market share.
- Considering the volume of Russian deliveries, Gazprom will inevitably become the dominant supplier in spot markets and will be able to exercise a decisive influence on prices.

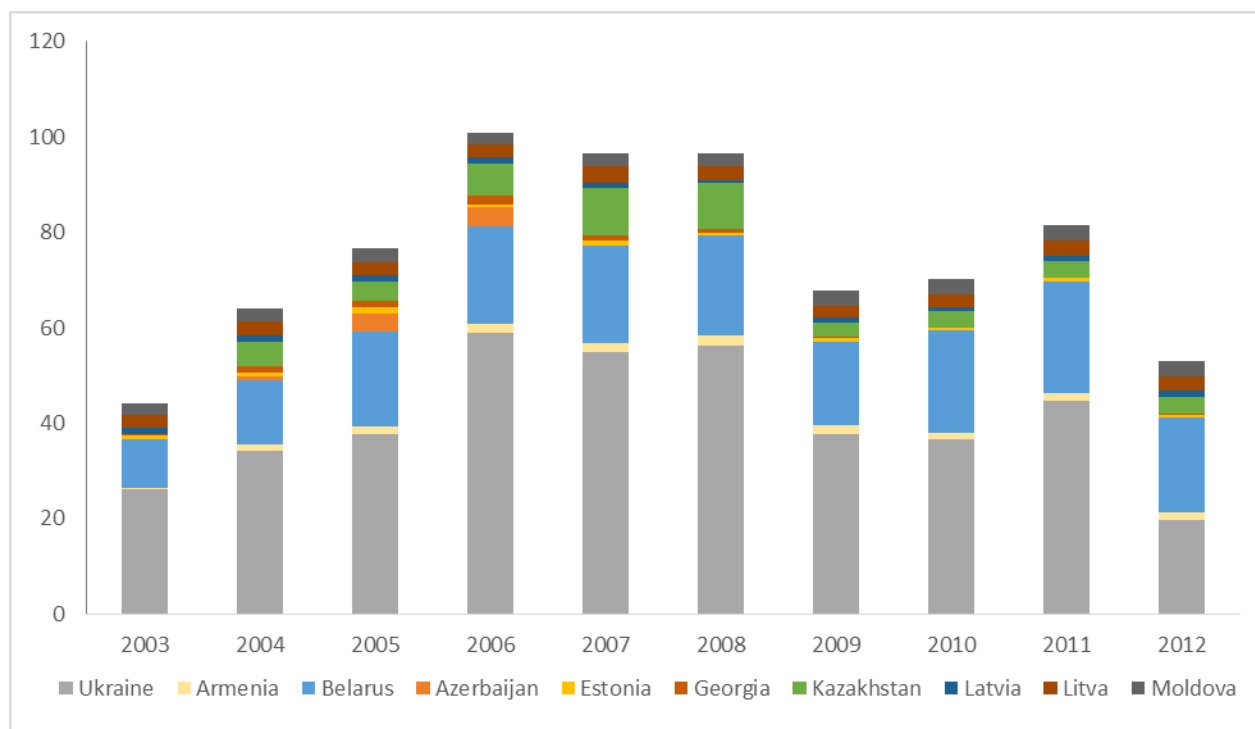
The transitional stage that the European market is experiencing will demand considerable effort on Russia’s part, regardless of exactly which option it chooses. In any case, the European

market, notwithstanding the fact that it will become more complex and competitive, will remain the center of attention of the Russian export strategy.

Former Soviet Union Market

Key trends in gas exports to the former Soviet Union (FSU) countries since the crisis include: decrease in gas export volumes, mainly a dramatic decline in gas sales to Ukraine (Figure 31), due to high oil-indexed gas prices; weak economic performance of these countries; and their import diversification strategy in order to reduce overdependence on Russian gas.

Figure 31. Gas Exports to Former Soviet Union Countries, 2003–2012



Source: Gazprom

LNG Export

European and CIS gas demand decline and Russian gas supplies reduction, changing pricing mechanism, and European Commission anti-trust investigations against Gazprom are increasingly pushing Russia to diversify its gas exports. However, diversifying exports through the development of LNG has proven to be not so simple. Over the past 20 years, with the

exception of the Sakhalin-2 project, which was structured under a project-sharing agreement (PSA), all other projects failed to come close to completion. The Kharasavey and Baltic LNG projects were abandoned in the early stages of project evaluation, while the famous Shtokman project made it so far as to have the operating company created, but in the end was postponed indefinitely. The first stage of LNG development in Russia ended in failure.

However, the Russian government considers the development of LNG exports to be a priority, which is evident in all official policy papers. It is believed that LNG will help achieve a set of objectives, namely: increasing the absolute volume of exports, allowing the country to enter into previously inaccessible markets, promoting the uptake of new technologies, enabling the development of related industries, supporting the development of critical regions such as the Arctic and the Far East, restoring the strategic importance of the Northern Sea Route, and strengthening Russia's geopolitical influence in the Asia-Pacific region.

Under intense pressure from the government, which has called for a swift delivery of its LNG strategy, Gazprom began to rework its strategy and pursue new options, namely: the expansion of the Sakhalin-2 project, the Vladivostok LNG project, and the new Baltic LNG project (Table 2).

Table 2. Main Russian LNG Projects

Project	Companies	Started in	Output, mln. tons per year	Investments, bln. \$	Target markets
Sakhalin-2 expansion (3 rd train)	Gazprom, Shell, Mitsui, Mitsubishi	2017	5	5-7	Asia Pacific
Vladivostok LNG	Gazprom	First phase 2018; Second phase 2020 Third phase 2022	15	12,4	Asia Pacific
Sakhalin-1 LNG	Rosneft, ExxonMobil	First phase 2018; Second phase 2021	10	15	Asia Pacific
Yamal LNG	Novatek, Total, CNPC	First phase 2016; Second and third phase 2018	16,5	20	Europe and Asia Pacific
Shtokman LNG	Gazprom	Postponed	15	30	Europe
Baltic LNG	Gazprom	2018	10	5-7	Europe

Source: Company data

At the same time, IGPs started making their move in the market in anticipation of amendments to the existing institutional framework. Indeed, the desire to get a strategic position on the global LNG market preempted the liberalization of LNG exports, a feat which seemed practically unfeasible not so long ago and became a reality with the passage of the recent bill. On December 1, 2013, the law on LNG export liberalization came into legal force. The law allows two categories of companies other than Gazprom and its subsidiary companies to have LNG export rights: 1) users of mineral resources that have a license to construct an LNG plant or to send their gas production for liquefaction; and 2) companies that are more than 50% owned by the Russian government for gas produced from Russian offshore fields or under production-sharing agreements. This partial liberalization will affect only companies that have a special status, e.g., Rosneft with its Sakhalin-1 project and Novatek with the Yamal LNG project. For all remaining participants, entry to the export market is still blocked. Moreover, the new law says that “in order to avoid competition between Russian exporters on the external markets, special mechanism of LNG export coordination is envisaged. In particular, gas exporters are obliged to provide the Energy Ministry with information according to the procedure established by the Russian Government.”

Nevertheless, even such a limited change in the institutional framework is breeding new competition between market participants. For Gazprom, LNG exports offer a chance not only to compensate for the slowdown in Europe, but also to restore its reputation as an industry leader in the eyes of the country’s leadership. For Novatek, Yamal LNG is the company’s largest project on which it has placed all its bets and is its only chance to obtain an export margin. For Rosneft, the Sakhalin-1 project is an opportunity to gain a competitive edge on Gazprom and develop export capacity for future gas projects. In fact, the fierce competition developing between projects is really a struggle to obtain the status of the “most efficient and high-tech player” in the Russian gas market. Of course, winning is highly dependent on a number of key decisions taken by the country’s leadership—who serve as the ultimate arbitrator in this battle.

Russian leadership is actively campaigning for the launch of LNG projects, and despite all the problems and high costs, some will be completed by the end of this decade. Delivery times and costs, though important, are not critical: while the return-on-investment for these projects—

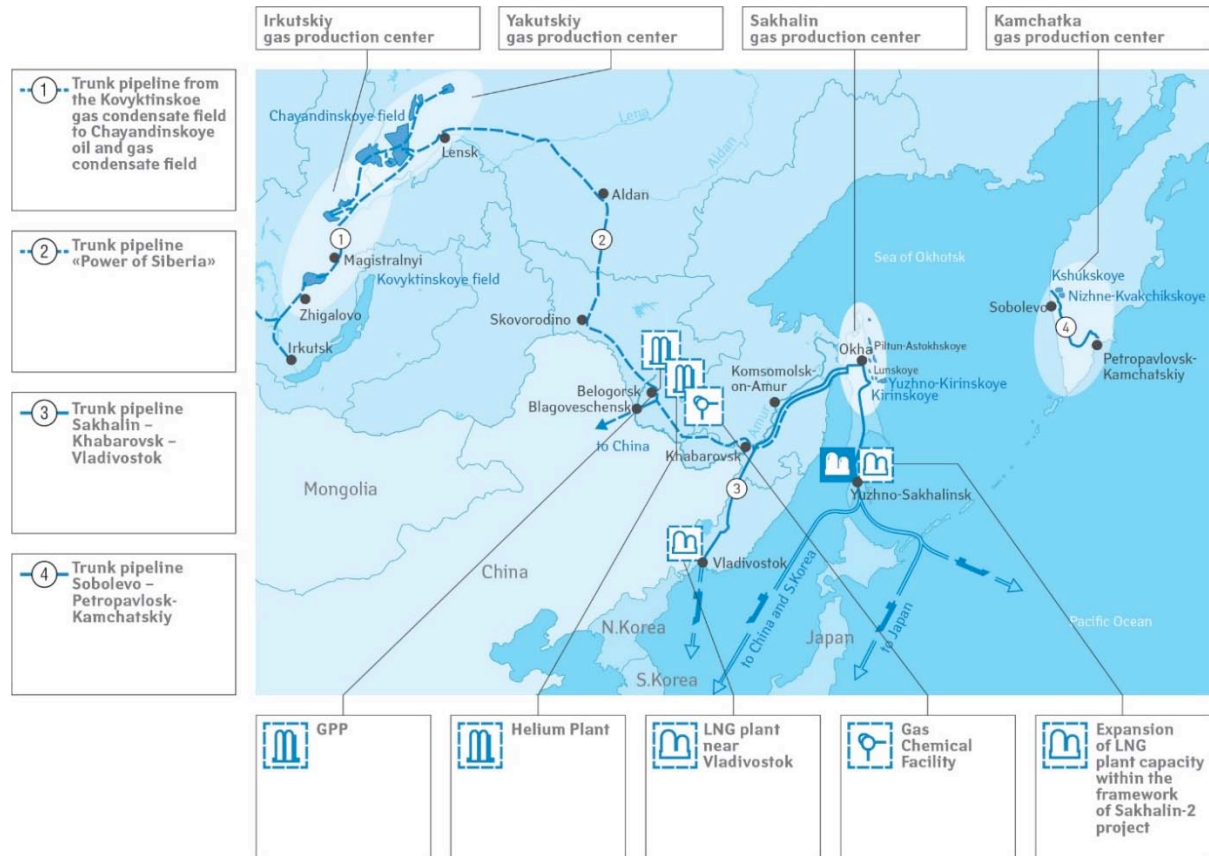
worth tens of billions of dollars—may be delayed, there is no doubt that sooner or later—not in 15 years, but perhaps after 20—they will pay off. Moreover, their strategic value in the eyes of the government is immense.

Asian Pipeline Exports

Russia also needs to develop gas exports eastward, not just because of the adverse economic and political situation that plagues Europe, but because the demand for gas in Asia will be growing noticeably more quickly. Russia approved its “Eastern Gas Program” in 2007, but so far, very little has been done to make it a reality. From the very beginning, the program had incorporated several pipeline options, and even today there is still no clarity concerning pipeline routes, with all of them at various times having been described as being “possible”: Power of Siberia from Chayandinskoye field to Vladivostok with a leg to China, Sakhalin-Khabarovsk-Vladivostok-China, and even Altai from Western Siberia to China.

The initial program did not envisage any LNG production development (apart from the Sakhalin-2 project). Now the situation is changing. The LNG business is becoming a battleground between the leading Russian oil and gas companies, with Rosneft and Gazprom announcing three LNG projects in the Russian Far East (Sakhalin-2, Sakhalin-2 train 3, and Vladivostok LNG), while Novatek also has its sights set on the Asian market with its Yamal-LNG project. There are many competing projects and contradictory signals concerning their priorities and sequence (Figure 33).

Figure 33. Eastern Gas Program



Source: Gazprom

At the same time, Eastern Siberia and the Far Eastern regions of Russia are not yet ready for a massive increase of exports, with the resource base still at a very early stage of development. While Sakhalin Island is estimated to have huge hydrocarbon reserves, so far only Sakhalin-1, -2, and -3 are under development. Their production will peak in 2020 at approximately 50 bcma, which will be mainly utilized for LNG production and Russian Far East gasification.

A realistic timeframe for bringing the Eastern Siberian fields (Chayandinskoye, Kovyktinskoye, Yurubcheno-Tokhomskoye, and Kuyumbinskoye fields) online is in the early 2020s (at the same time as the expected LNG glut) with up to 70 bcm production on plateau. This means that by 2020, the total export potential of Eastern Siberia will be limited to 15 bcm, and that of the Far East to 40 bcm (both pipeline and LNG exports). It is only by 2030 that the export potential of Eastern Siberia may reach 68 bcm, and that of the Far East 40 bcm. As it stands, Russia, which is prioritizing LNG export development, has very limited capacities to organize pipeline exports to

China. Realistically, Russian pipeline gas exports to China might start post 2020 at 40 bcm maximum, though there is a danger that by that time Chinese demand would already be satisfied by LNG.

Long and painful price negotiations with China, which have already lasted a decade, haven't resulted yet in a contract. In 2006, a framework agreement over the supply of 68 bcm via two pipelines was signed. Although some agreement has been reached over the final gas transportation route since then—the Altai pipeline project has been abandoned—negotiations were still struggling over issues including the gas price formula. A binding agreement over gas volumes (38bcm/year), periods (30-year as from 2018), take-or-pay volumes, and delivery point was reached in September 2013. But as of early 2014, the price was still not agreed upon.

The main problem is that although energy-hungry China is seeking additional volumes of imported gas, it is also actively pursuing other gas supply opportunities—including its own domestic unconventional production, pipeline gas from Central Asia, and new sources of LNG—which could lower its need for Russian gas if the deal continues to be postponed. In any case, China will have the whole period from 2014 to 2020 to assess the feasibility of domestic shale gas production and the supply-demand balance on the global LNG market and to choose the optimal mix of gas supply sources. Currently, China is in a very good position to make that choice.

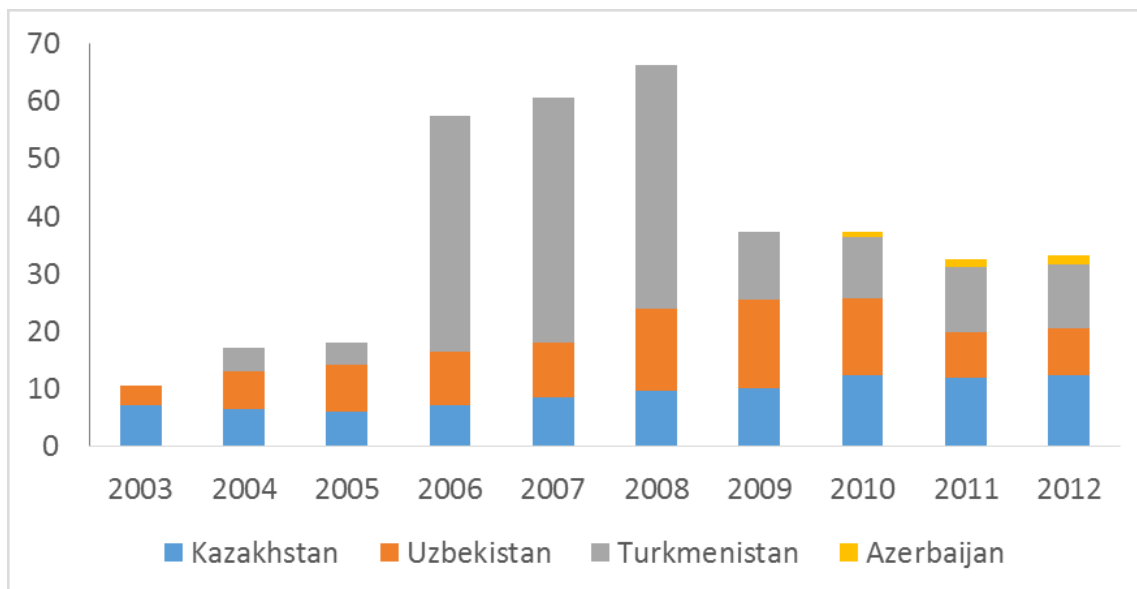
At the same time, this deal is becoming critical for Gazprom. The government has placed Gazprom under increased competitive pressure from Novatek and Rosneft, and both companies are challenging Gazprom on gas production, domestic sales, and now LNG export. Both have already signed some deals with CNPC, while Gazprom has not. Novatek and Rosneft are eager to secure a number of contracts with high-growth Asia-Pacific consumers, especially China. The main problem is the rivalry with Rosneft, whose ambitions are likely to lead it to actively try to eliminate some of the advantages Gazprom enjoys as the state's dominant gas producer with a legal monopoly on pipeline gas exports. Rosneft is actively developing its gas strategy now on the domestic market, and has also done a deal with CNPC in 2013, allowing CNPC to own equity share in the East Siberian gas field—something the Chinese have been requesting from

Gazprom for many years with no luck. In addition, several times Rosneft representatives unofficially mentioned their intention to start gas pipeline exports to China. Rosneft's CEO Sechin, who gets strong political support from the Kremlin, has very positive track record on negotiations with the Chinese on oil deal. Rosneft might pretend to get the position of "Eastern gas export operator" (which currently belongs to Gazprom). This would be a disaster for Gazprom's strategic position in the Russian political playground. Thus, the stakes are very high—Gazprom cannot afford to fail with this Chinese deal.

Gas Imports

Russia has been importing gas from Central Asian for many years—in the early 2000s, when domestic and export demand were booming, it seemed to be the cheapest and easiest way to cover the gap. But as Central Asian export prices were increasing (until they nearly reached netback parity with the European prices) and at the same time demand both in Russia and in Europe slowed down, these imports have lost their attractiveness. In order to at least partially alleviate the overabundance of gas on the Russian market, gas imports from Central Asian countries were drastically reduced in 2009. The explosion at the gas pipeline from Turkmenistan and subsequent deterioration of relations with that country contributed to this as well. Currently, import volumes hardly exceed 30 bcm/year (Figure 34).

Figure 34. Russian Imports of Central Asian and Caspian Gas (bcm)



Source: Gazprom

However, even these measures failed to avoid the “gas bubble” situation on the stagnant domestic market with an inevitable boost of competition. The main reason to maintain these imports currently is due to geopolitical considerations—not to completely lose Russia’s influence in Central Asia. In addition, these import pipelines are well-placed to supply parts of Russia’s southeast territory. Finally, these gas purchases allow Gazprom to transport part of this gas in the transit regime to European markets, thus avoiding paying the export duty.

Russia’s Current Macroeconomic Situation

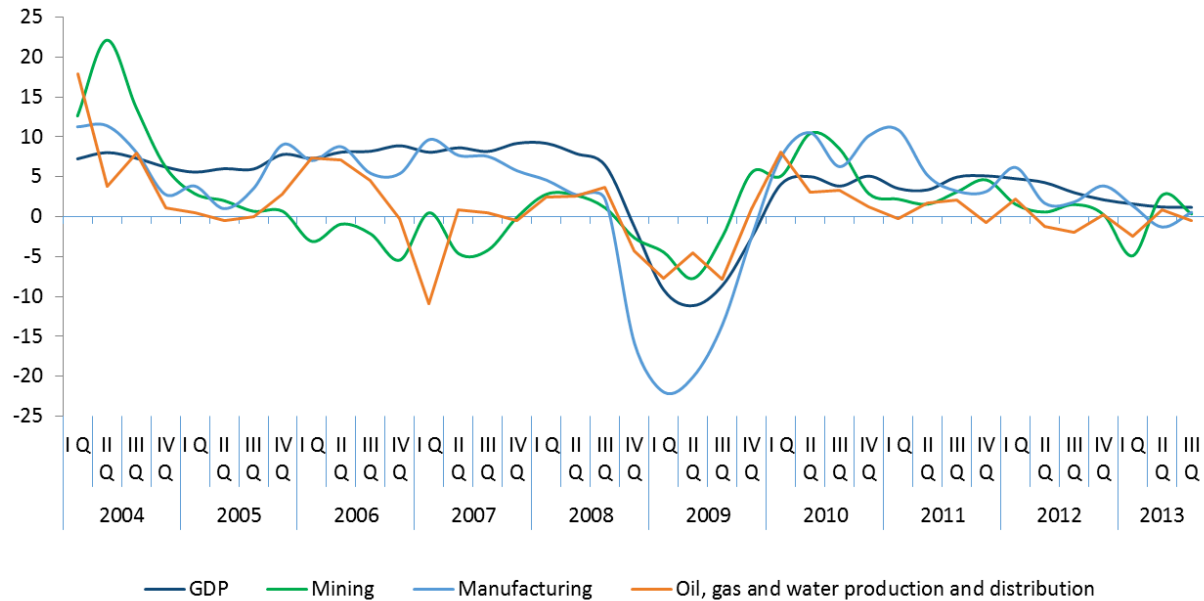
In the early 2000s Russia was demonstrating very dynamic economic development with 6–8% GDP growth per annum, but this growth was mainly fueled by hydrocarbon exports. This resource-based model functioned quite well even through the global economic crises (in 2009, the country’s GDP experienced the steepest decline among the G-8 countries that year, though continued a steady slow rise), but now there are serious doubts concerning the ability of the country to maintain this path of growth. After the pre-crisis GDP level (in national currency at constant prices) was attained in 2012, GDP growth has practically halted. Since then, the Russian authorities have been struggling with an increasingly evident economic slowdown. In 2013, Russian economic performance turned out to be much weaker than expected, even despite high hydrocarbon prices—just 1.3% economic growth, compared to 4.5% in 2012, due to slowdown in consumption, stalled investment demand, and a continuing weak external environment.³⁸

Manufacturing and industrial output entered into a stagnation phase (Figure 35). The growth of capital investment in industrial assets fell from 14–16% in 2012 to negative in 2013. Producers started to close plants—which could mean increasing unemployment and social tensions—saying that the current situation is even worse than in 2008. Furthermore, the lack of significant institutional reforms aimed at solving key problems—from reducing the numerous pressures on businesses from the authorities and barriers to business, to reducing the scope of involvement of governmental and quasi-governmental companies and developing competition—gives no grounds to hope for a fast, self-sustained recovery. The Russian government is strongly

³⁸ “Russia Economic Report: Structural Challenges To Growth Become Binding,” The World Bank, Report No. 30, September 2013.

concerned by such a visible decline. Even high oil prices cannot stimulate economic growth any more—the existing economic model sputtered out.

Figure 35. Growth of GDP and Added Value in the Industry (percentage to the corresponding last year's quarter)



Source: Federal State Statistics Service, ERI RAS

The slowed growth is due in part to a worsening situation in external markets. In 2013, the volume and worth of exported goods and foodstuffs declined. The weaker performance of export-oriented companies has been accompanied by a domestic slump—a lower demand for fixed investments, a negative trend in state capital financing, and weaker corporate lending. Supposedly the GDP curve passed its lowest point in the middle of 2013, and for 2014 the government and the World Bank predict an acceleration up to 3%, while inflation is expected at 5.6–5.7%. (Table 3). But even this very moderate (according to Russian standards) growth is not guaranteed.

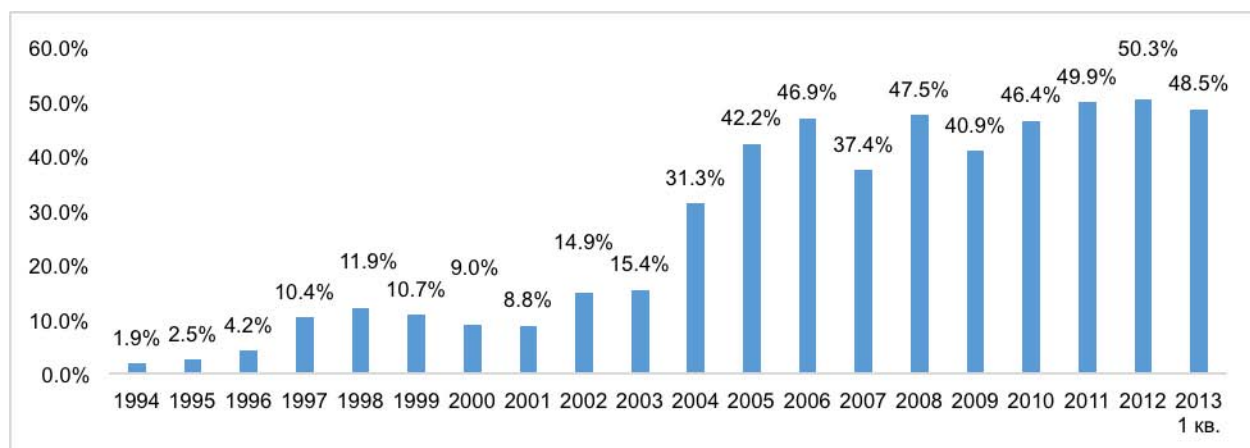
Table 3. Main Macroeconomic Indicators of Russia's Development

	2008	2009	2010	2011	2012	2013*	2014*
GDP at current prices, USD billion	1657.7	1224.2	1523.3	1897.9	2012.8	2112.9	2192.7
GDP growth, %	105.2	92.2	104.5	104.3	103.4	101.8	103.0
Average annual Consumer Price Index, %:	114.1	111.7	106.9	108.4	105.1	106.7	105.6
Industrial Production Index, %:	100.6	90.7	108.2	104.7	102.6	100.7	102.2
Growth of agricultural output, %	110.8	101.4	88.7	123.0	95.3	107.0	102.0
Economically active population (EAP), million	73.3	73.7	73.1	72.6	72.1	71.8	71.6
Unemployment, % of EAP	6.4	8.5	7.6	6.8	5.7	5.7	5.7
Exports, USD billion	471.6	303.4	392.7	515.4	528.0	511.4	506.2
Imports, USD billion	291.9	191.8	248.7	318.6	335.7	343.5	353.4

* Estimate

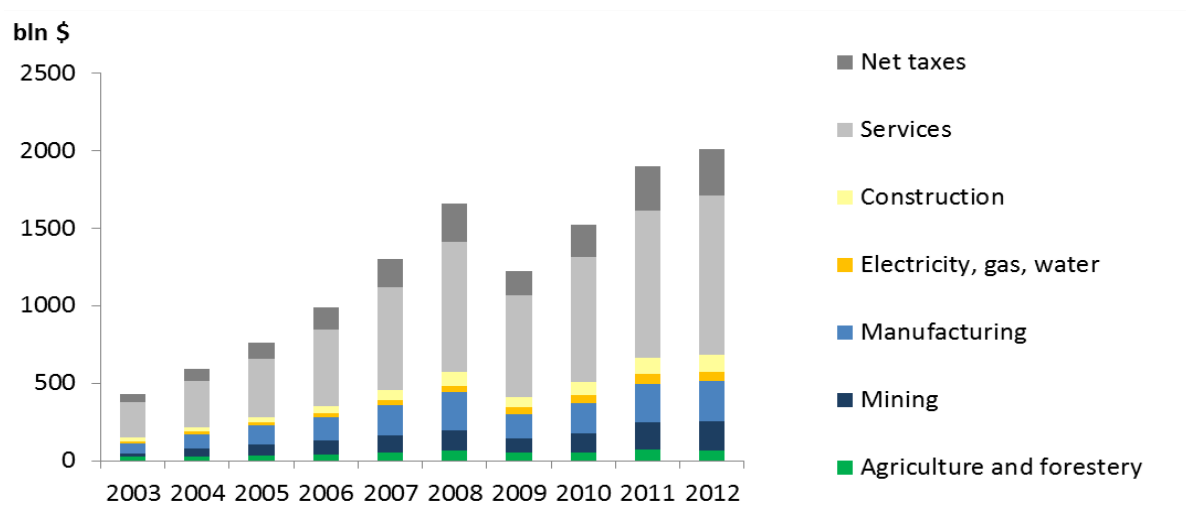
Source: Main indicators of the Ministry of Economic Development's "Socio-Economic Development Forecast Until 2016," prepared in September 2013, Bank of Russia

Moreover, Russia's economy is demonstrating increasingly strong signs of the Dutch disease. In 1994, the share of the oil and gas sector's revenues in the national budget was below 2%, whereas now it has reached about 50% (Figure 36). This leap has been driven by the oil price hike since 2004. Indeed, Russia's GDP growth is largely explained by the rising international prices of oil, gas, and other raw materials, rather than by the successful development of other industries.

Figure 36. Share of Oil and Gas in Federal Budget Revenues

Source: State Treasury, Ministry of Finance

Although the Russian economy has been growing quickly in the past 10 years, its structure has remained practically unchanged; the effect of the announced “modernization” is modest, if not invisible; and the share of high-tech industry did not grow at all. In fact, according to Rosstat statistics, the share of high-tech industries in Russia’s GDP fell from 1.14% in 2003 to 1.04% in 2012. Such an insignificant level of high-tech activity is unable to make any impact on an economy entirely focused on raw materials. Since 2003, manufacturing, agriculture, forestry, and fishing have become somewhat less important, while mining has become more substantial, although quite low compared to the tremendous service sector—which accounts already for over 50% of the Russian GDP and in many cases reflects re-sales and “virtual GDP” (Figure 37).

Figure 37. Changes in the Structure of Russian GDP, 2003–2012

Source: Rosstat, Bank of Russia

Moreover, Russia is still far from the most attractive market for foreign investment—since 2007, direct foreign investments have diminished by 45%. Survey data suggests that Russia is still perceived as prone to serious problems with corruption and bureaucratic interference, which contribute to the costs and risks of doing business (see Table 4). Doubts persist about the respect for contracts and private sector property rights, a factor that discourages investment.

Table 4. Russia's Ranking in International Ratings

Date, index	Organization	Russia's ranking	Total countries rated	Details
2013 Index of Economic Freedom	Heritage Foundation	139	161	Russia is in the Mostly Unfree group. The Repressed group starts from the 145th ranking
2013 Ranking of Countries for Mining Investment: "Where Not to Invest"	Behre Dolbear	25	25	
2012 Corruption Perception Index	Transparency International	133	174	Russia shares its rating position with Iran, among others
2013 Doing Business Report (overall rank)	World Bank	112	185	In 2012 president Putin instructed the government to take measures to raise Russia's ranking to the 50th position in 2015 and to the 20th position in 2018. However the Doing Business rating may be biased and dependent on insignificant factors. In this connection a group of independent experts set up by the World Bank, including Sergei Guriev, former head of the New Economics School, recommended discontinuing it.
2013 Doing Business Report: Protecting Investors	World Bank	117	185	Russia took the 60th position in 2007. Since then it has been declining
Report, 28 June 2013	Standard & Poors	BBB (Lower medium grade)	-	The BBB rating has been confirmed since December 2008. Russia seeks to boost its credit rating by no less than two steps to A- by 2016 and another level to A by 2020, according to a government plan approved in March.
Report, 11 June 2013	Fitch	BBB (Lower medium grade)	-	The BBB rating has been confirmed since February 2009.
Report, 27 March 2013	Moody's	Baa1 (equivalent to BBB+)	-	The BBB rating has been confirmed since July 2008.

Sources: Heritage Foundation, Behre Dolbear, Transparency International Index, World Bank, Standard & Poors, Fitch, Moody's

Weak economic performance accompanied by growing unemployment and falling disposable incomes, together with high corruption and huge social disparity, are increasing social discontent. However, President Putin still enjoys extremely high ratings (especially in the regions) of 47%, though this is much lower than the 70% he had in 2002.³⁹ The wave of open protests related to the Duma and presidential elections in 2011–2012 is over, but different sorts of hidden protests and disaffection seem to increase. Therefore, for the government it becomes also a question of political stability—to assure sufficient economic growth and budget spendings (and revenues, of course).

Scenarios of Economic Growth, Political Dynamics, and Anticipated Implications for Energy and Gas

Scenarios of Economic Growth and Political Dynamics

Based on the above assessment of the Russia's macroeconomic and political situation, hydrocarbon industry, policy, and position in the global market, this section examines possible economic and political scenarios and their potential impact on the Russian gas industry, external gas strategy, and position in the international market.

Below in Table 5, there are four scenarios that could arise in the decades ahead involving the interplay between politics and Russian gas strategy and their impact on Russian gas development. One axis of the scenario field reflects different assumptions on *domestic governance and economic growth* with two major options: either to maintain the current political and economic system, which is showing already many signs of inefficiency, or to take the risk of a transitional period and try to modernize it, first of all promoting market reforms and limiting the role of the state in the governance (“innovative” and “conservative” macroeconomic scenarios, correspondingly). The second axis of the scenario field is dedicated to the *external environment*, which in fact plays an incredibly important role in the future development of the Russian economy, political system, and oil and gas industries.

³⁹ “Vladimir Putin’s rating dropped to historic lows,” *TV Rain*, December 4, 2013, http://tvrain.ru/articles/rejting_vladimira_putina_opustilsja_do_istoricheski_nizkoj_otmetki-358090/.

Table 5. Scenario Matrix

		External environment	
		Favorable external environment <i>(High demand for hydrocarbons, high oil and gas prices)</i>	Unfavorable external environment <i>(low demand for hydrocarbons, low oil and gas prices)</i>
Domestic governance and economic growth	Maintaining the current political and economic system	Stagnation (“Zastoi”) <i>Conservative macroeconomic scenario</i>	Collapse <i>Conservative macroeconomic scenario + oil price drop</i>
	Modernization of the current political and economic system and market reforms	Breaking through <i>Innovative macroeconomic scenario</i>	Muddling through <i>Innovative macroeconomic scenario + oil price drop</i>

Economic growth assumptions correspond to the recent report—quite balanced and reasonable—“National social and economic development forecast over the period up to 2030,” published by the Ministry of Economic Development (MED) in November 2013.⁴⁰ The aggregated MED forecast was detailed by ERI RAS model package SCANNER⁴¹ as per the types of economic activity and in terms of regions to the levels needed to estimate fuel/power demand and to forecast the gas balance.

Innovative macroeconomic scenario. According to the MED innovative scenario, from 2010 to 2030, the national population will remain within 141–144 million citizens and GDP will double (Table 6) with improvement of its structure. The main features of this scenario are as follows:

⁴⁰ “Long-term social and economic development forecast of the Russian Federation for a period to 2030,” Ministry of Economic Development, Moscow, 2013. The MED forecast includes four scenarios, two intermediate; they are the conservative and innovative scenarios are employed to forecast gas market development.

⁴¹ A.A. Makarov, F.V. Veselov, et al., “Supercomplex of active navigation in energy research,” ERI RAS, Moscow, 2011.

- Creation of cost-effective national innovative system; activation of fundamental and applied research and design (R&D); R&D expenditures increase up to 3–3.5% of GDP.
- Reproduction of qualified labor; higher quality of human capital assets; final result-oriented social structure; education expenses must be 4–5% of GDP; health care up to 5–6% of GDP.
- Higher cost-effectiveness of primary resource utilization, first of all labor and energy; labor productivity must triple by 2030 and energy capacity must be lower by 50%.
- Economy diversification and establishment of a leading role for the “knowledge industry” and high tech industries, percentage of which must be doubled.
- Proactive approach in development of new markets; updating of product range, technologies and business management; percentage of enterprises involved in innovations must reach 40–45%; percentage of innovative products must reach 25–30%.

In order to achieve these results, major institutional changes and market reforms are necessary (such as massive privatization and a decrease in the role of state corporations, reform of the judicial system, support for small and medium business, etc.), which are impossible without certain changes in the political system.

Conservative macroeconomic scenario. Along with the innovative scenario, MED has studied (and takes as a baseline) a conservative scenario, which extrapolates the post-crisis prevailing trend of slow development in the Russian economy, and does not envisage how to apply the above tools to drive it (Table 6).

Table 6. Critical Russian Economy Development Performance (Percentage by 2010)

Indicators	2010	2015	2020	2025	2030
Gross domestic product	100	117-119	139-147	161-179	183-214
Equity investments	100	119-122	171-194	211-254	200-315
Manufacturing	100	116-120	132-138	148-160	172-211
Real income of population	100	115-120	141-148	168-183	187-227
Inflation, %/year	8.8	4.9	4.2-4.3	3.2-3.7	2.7-2.6
Exchange rate, Ruble/Dollar	30.4	34.3-34.4	36.3-39.2	38.1-38.9	36.9-36.3
Population, million citizens	142.9	143.8	143.9	143.1	141.8

* The first values to be applicable to the conservative scenario; the second values to be applicable to the innovative scenario

Sources: RF Federal Statistics Service, MED forecast, and ERI RAS estimates

On top of these two macroeconomic scenarios, which both assume rather high oil prices—rising from \$(2010)93/bbl for Urals in 2014 up to \$(2010)110/bbl—and growing Russian hydrocarbon export volumes, there could be some “stress scenarios,” related to the possibility of far less favorable external conditions with the Urals price fluctuating around 2010\$72–78/bbl for the whole period until 2030. These external challenges are in fact increasing: there is a growing likelihood of a fall in world oil prices and in the volumes of Russia’s hydrocarbon exports.

The price of Urals is the most influential factor for Russia’s economy, because oil exports account for more than one-third of federal budget revenues (37% in 2012), and because gas prices in Europe are related to the oil prices. The break-even oil price, necessary to balance the Russian budget, is very high: in 2013 the official target was \$97/bbl.⁴² If the global price of oil goes down, economic resilience and prospects of maintaining social stability will be questioned.

Another threat is a potential reduction in hydrocarbons export volumes. The gravity of the risks is manifested in the stagnation of oil and gas production and exports: thus, gas exports in 2013 are at the level of 2000. Recent studies⁴³ show that owing to the lack of development of an institutional framework, an outdated tax system, low competition, and low investment efficiency, in the future Russia will be the most sensitive of all the largest energy producers to fluctuations in global hydrocarbon markets. The serious risks for Russia arising from the transformation of global energy markets include declining oil and gas exports and export revenues, relative to planned official indicators, which may lead to slower-than-expected GDP growth and to deterioration of the main parameters of the Russian energy sector. Falling revenues from exports of gas—and especially oil—could considerably reduce their contribution to GDP.⁴⁴ The powerful multiplicative effects typical of these sectors, along with lower inflows of foreign capital, could magnify the impact of decreasing export revenues and further slow economic development,

⁴² “Neft i gaz prinesut v budget Rossii v 2013 godu bolshe zaplanirovannogo,” Lenta, September 17, 2013, <http://lenta.ru/news/2013/09/17/dohod/>.

⁴³ A. Makarov, L. Grigoriev, and T. Mitrova (eds.), “Global and Russian Energy Outlook up to 2040,” ERI RAS – ACRF, 2013, p. 110.

⁴⁴ E. Gurvich and I. Prilipskiy, “Kak obespechit vneshnuu ustoychivost rossiiskoy ekonomiki,” *Voprosi Ekonomiki* no. 9, 2013, p. 4–39, <http://www.eeg.ru/files/lib/230913.pdf?PHPSESSID=810ba946012738af91b2195255128a2d>.

leading to deep economic recession. A preliminary assessment of their impact on economic growth shows a slowdown of one percentage point each year, due to decreased energy exports.⁴⁵

This scenario is a direct threat to the Russian authorities, and accompanied by the rising protests, it could lead even to the collapse of the current economic and political model. In this context, a comparison could be made with the Soviet Union in the mid-1980s, when changes in the international oil markets led to a collapse in the USSR's export revenues and became one of the reasons for the country's demise. Now, changes in the international oil and gas markets, and in particular uncertainties associated with the rapid development of shale oil and gas production, are creating new risks for the sustainability of Russia's economy.

Summing up, four major scenarios of the Russian economy and political system development could be defined (Table 5). The first most probable is the "Stagnation scenario" ("Zastoi," like in Brejnev time), which comprises a conservative macroeconomic scenario in a favorable external environment. In the situation of a drop in the global oil price, this scenario has high probability to end up as the "Collapse scenario." Moreover, even with high prices earlier or later this model could lead to collapse simply because the potential for resource-driven economic development will be completely exhausted.

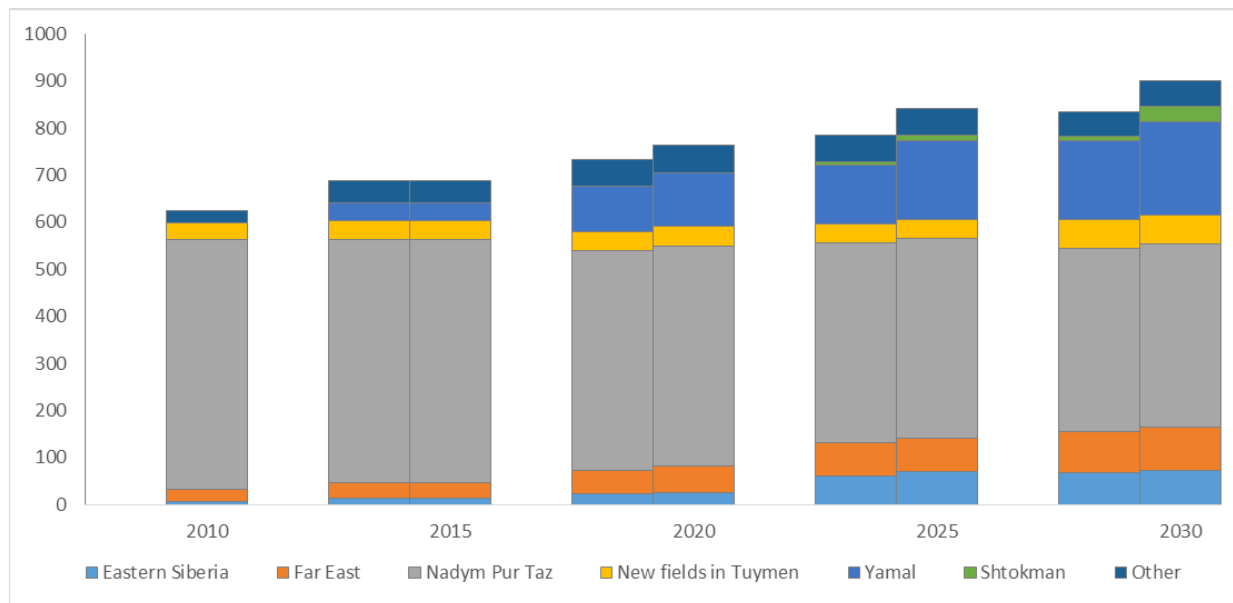
If the government is able to implement deep market-oriented reforms, dramatically transform the existing institutional structure, and create an attractive investment environment, then the national economy has a chance of switching to the innovative macroeconomic scenario and thus to follow the "Breakthrough scenario," which would potentially make Russia a different country—one of the global economic leaders. But if the external environment is not favorable, even market reforms might be insufficient, and the success of modernization could be postponed for a long period of time, making Russia following the difficult "Muddling through scenario."

⁴⁵ A. Makarov, T. Mitrova, and V. Malakhov, "Prognoz mirovoy energetiki i sledstviya dlya Rossii," *Voprosi prognozirovaniya* no. 5, 2013, p. 34–51.

Anticipated Scenarios and Implications for the Gas Sector

Since Russia has no gas resource constraints, its future gas production depends on the availability of markets: if the international market situation is favorable and gas exports are competitive, and if the domestic economy develops and domestic gas demand grows, Russia is potentially capable of a huge increase in its gas production. In the favorable external environment scenarios, Russian natural gas production could increase from 649 bcm in 2010 up to 900 bcm in 2030. But if the external situation is unfavorable, production will remain below 835 bcm (Figure 38).

Figure 38. Gas Production Profile and Regional Structure in the Conservative and Breakthrough Scenarios (bcm/year)



Note: In each year, the first bar is applicable to the conservative scenario and the second bar to the innovative scenario.

Source: ERIRAS estimate

At any rate, in all the scenarios, gas production will be developed both in the traditional gas producing regions in the Western Siberia,⁴⁶ in the new provinces of the Eastern Siberia, and the Far East, as well as in the Caspian.

⁴⁶ A Gazprom presentation to investors in 2013 notes that the same West Siberian fields that were operated by Gazprom in 2010 and producing about 500 bcm were to dramatically reduce output to just above 100 bcm by 2030.

Gas production in the Ob-Taz Bay and Bolshekhetskaya depression will become higher against the gas production decline in the Nadym-Pur-Tazov region (from 531 bcm in 2010 to 390 bcm by 2030). New gas fields in the Western Siberia are rich with gas and condensate; in order to produce and to transport them, a large-scale development of gas processing plants will be required.

Gas production will increase on the Yamal (165–200 bcm by 2030), in the Eastern Siberia (67–72 bcm), and in the Far East (about 94 bcm). During development of the gas fields in the Eastern Siberia, characterized by high helium content (0.15–1%), the helium industry will need to be developed, including construction of a number of large gas processing plants and underground helium concentrate storages.

The Krasnoyarsk (based on the Sobinsko-Paiginskoye and Yurubcheno-Tokhomskoye fields and prospect in development of the Omorinskoye, Kuyubinskoye, Agaleevskoye, and the other fields) and Irkutsk (based on the Kovyktinskoye field and prospect in development of the South-Kovyktinsky license area, as well as the fields of the north Irkutsk region) gas production centers are expected to be established. This gas production is meant for Russia's domestic market and the Asia-Pacific region. Kovyktinskoe could produce up to 35 bcm per year at plateau level. Field operator LLC Gazprom Dobycha Irkutsk recently announced that it would start operation on the field during the third quarter of 2013 and start production in the third quarter of 2016.

In the Far East, the significance of the Yakutsk gas production center (based on the Chayadinskoye field and prospect in development of the neighboring Srednebotuobinskoye, Taas-Yuryakhskoye, Verkhnevilyuchanskoye, and other fields) will become abruptly predominant with stabilization of production on the Sakhalin (implemented Sakhalin-1 and Sakhalin-2 projects, and prospective Sakhalin-3 to Sakhalin-6 projects) at the level of about 40 bcm and commencement of development of the West-Kamchatka sector of the Pacific Ocean. Gazprom initially has announced that it will develop Chayanda first, estimating its cost at US\$13.7 billion and plateau production at 25 bcm in 2021 (plus 1.5 mtoe of oil production in 2027 at plateau). In October 2012, the Gazprom Management Committee adopted the FID on the Investment Rationale for the Chayadinskoye field pre-development, transmission, and

processing of gas, with the field expected to be commissioned in 2017. The field requires expensive gas and helium treatment/storage facilities. This helium-rich gas from both fields is to be treated at the Belogorsk chemical complex (to be constructed by Gazprom) and then transported to markets via the Power of Siberia pipeline system Kovytko-Chayanda-Khabarovsk-Vladivostok.

More production is also expected to come from the Sakhalin province, which produced 27 bcm of gas in 2012. In addition to ongoing production at the Sakhalin-1 (only limited volume) and Sakhalin-2 projects, more production is expected to come from the Sakhalin-1 and Sakhalin-3 fields, while substantial incremental production in Sakhalin-3 is expected only in the longer term. Gazprom holds licenses for three blocks within the Sakhalin-3 project: Kirinsky, Ayashsky, and Vostochno-Odoptinsky. Total gas reserves of these blocks are estimated by Gazprom at about 1.4 tcm. In particular, the offshore Kirinskoye field (90 meters deep), currently believed to hold 137 bcm, is Gazprom's priority, and could produce 4.2–6 bcm/year. This field represents Gazprom's first 100% self-developed offshore project. Gazprom also discovered the large Yuzhno-Kirinskoye field within the Kirinsky block in 2010, with estimated reserves of 260 bcm and 29.9 mtoe recoverable condensate reserves. Peak annual production from Sakhalin-3 is currently projected at about 13 bcm. Gas from these fields is intended to be shipped through the Sakhalin-Khabarovsk-Vladivostok pipeline. In the short to medium term, Gazprom plans to perform seismic works and drill about 20 exploration wells within the Sakhalin-3 project, as well as starting production from the Kirinskoye field in 2013—up to 2 bcm by 2015. Produced gas is planned to be delivered to the onshore processing facility via undersea connecting pipelines and shipped onwards via the Sakhalin-Khabarovsk-Vladivostok gas transmission system.

It is noteworthy that Rosneft also possesses a number of licenses and has made important gas finds: the Veninsky block in Sakhalin-3, to be developed soon together with SINOPEC, contains 33.7 bcm of gas reserves. It will be developed in the course of a 30-year production period.

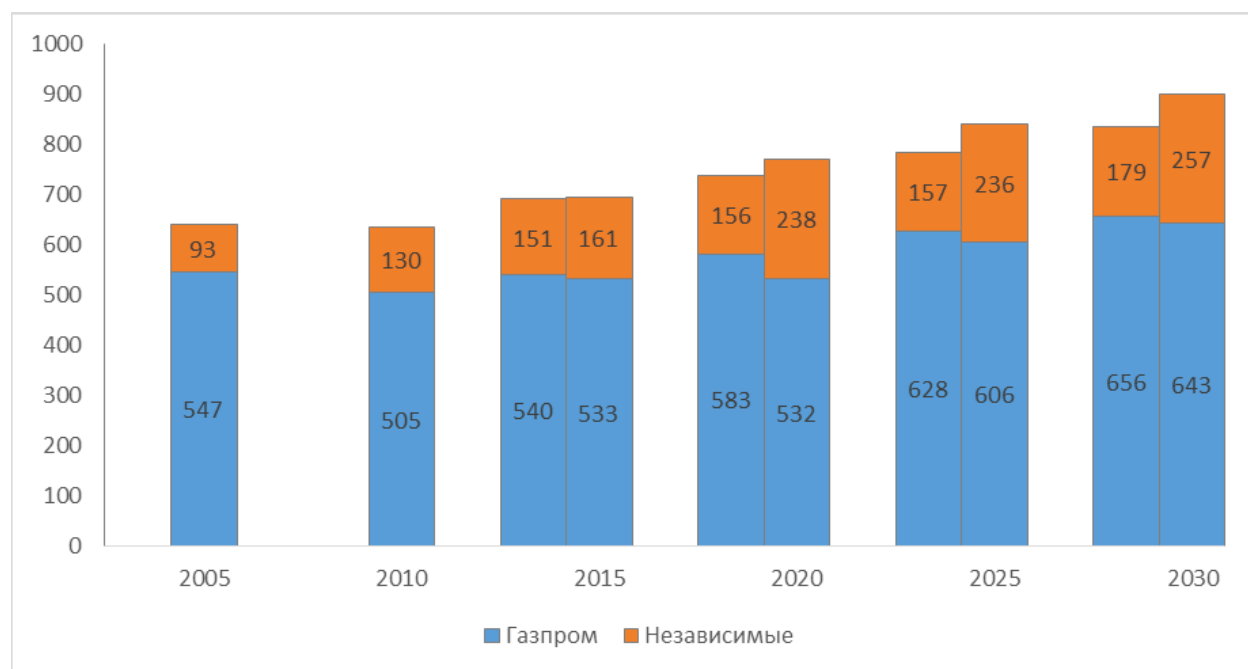
Gas production in the northwest of Russia will increase (up to 34 bcm by 2030). The Shtokman field is scheduled to be developed not earlier than in 2025 and will be dependent on the global oil and gas market environment.

Before development of a shallow shelf of the Karskoe Sea, the fields of the water area of the Obisk and Tar Bays will be developed. The development targets in the region will include the discovered Kamennomyskoye, North-Kamennomyskoye, Obiskoye, and Chugoryakhinskoye fields; they are expected to be developed together with facilities and infrastructure set-up of the onshore Parusovoye, Semakovskoye, and other fields.

All this new production is going to be quite expensive, as breakeven prices of the most costly (among those scheduled to be implemented) projects in the UGSS area are estimated to reach \$(2010)110–140 per mcm.

Further gas production growth by non-Gazprom gas producers is expected (Figure 39). In particular, it will be driven by the government's decision relating to mandatory recovery of 95% of associated gas. On top of that, Novatek and Rosneft each have ambitions to produce 100 bcma or more by 2020. When the contributions of other producers are added, non-Gazprom production already comprises more than one-quarter of the Russian total, and it is possible that it could reach as much as 300 bcm by 2020. The independents' growth will be driven not just by ambition and political support but also by the fact that much of the output will be relatively low-cost, as it is either located close to existing infrastructure or is produced in conjunction with liquids, which improves the overall economics of gas output. As a result, it is very competitive when compared with Gazprom's output, which is gradually starting to be produced in greater amounts from the remote and more expensive Yamal peninsula fields.

Figure 39. Gas Production Structure by Company in the Conservative and Breakthrough Scenarios (bcm)



Note: In each year, the first bar is applicable to the conservative scenario and the second bar to the innovative scenario.

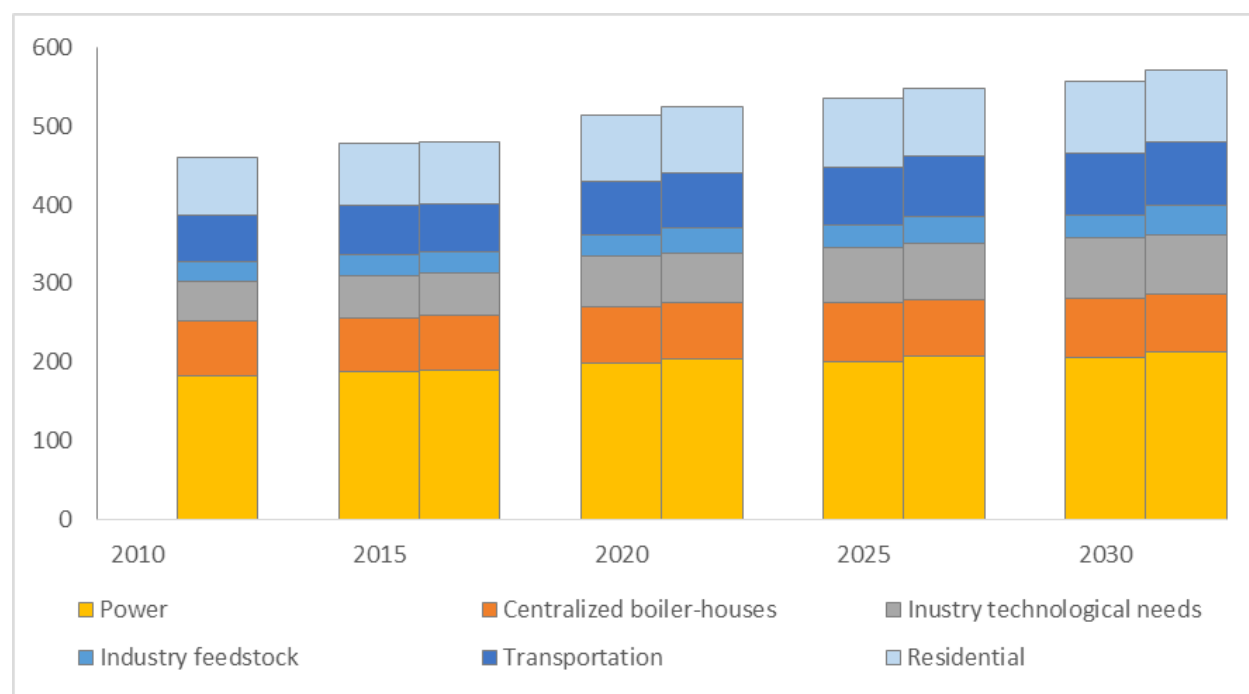
Source: ERI RAS estimate

Gazprom may decide to compete on price with the IGPs, but the gradual shift in its production portfolio towards more expensive Yamal production may undermine its long-term ability to do this, leaving it exposed to the risk of becoming a swing producer in a market that is fundamentally oversupplied with gas.

However, it should be noted that this forecast for IGPs is supported by reserves till 2025; after this date, the companies will need to obtain new licenses to provide for higher gas production. Thus, the further role of non-Gazprom gas producers will be dependent on the subsoil use policy pursued by the state. Despite their cost advantage, the full achievement of the independents' plans is not guaranteed, as technical difficulties with their gas fields and/or a competitive reaction by Gazprom could undermine their strategies, but the growth of the non-Gazprom sector does seem set to continue throughout the period.

Slower projections on GDP and industrial output growth, administrative measures to utilize this potential, and gas price increase are the main drivers of gas demand's comparatively slow growth in the future. According to ERI RAS projections, natural gas consumption is expected to show quite moderate growth (compared to the previous decades) from 459 bcm in 2010 to 555–570 bcm by 2030 (by 21–24%; see Figure 40). Power plants will continue to be a predominant gas consumer (though demand will increase slowly, mostly due to investments in modernizing the existing assets and lower electricity demand growth), together with the industry.

Figure 40. Gas Demand Structure by Sector in the Conservative and Breakthrough Scenarios (bcm/year)



Note: In each year, the first bar is applicable to the conservative scenario and the second bar to the innovative scenario.

Source: ERI RAS estimate

Though the Russian population remains stable, it is estimated that households will increase their gas consumption, mainly due to further gasification.⁴⁷ Gazprom Mezhhregiongaz concludes

⁴⁷ According to Gazprom's Annual Report, currently Gazprom is distributing gas in 69 Russian regions. The average penetration level of natural gas was 64.4% in 2012, including from 60% to 70% in cities and from 34.8% to 53.1% in rural areas.

gasification contracts with regional authorities and develops master gas supply and gasification schemes and proposals. Regions in turn need to prepare consumer infrastructure —construction of distribution networks, boiler plant switchover to natural gas, household preparation, and enforcement of timely payments for supplied gas. This is not a profitable business, since the population has much lower regulated prices than the industry, and is regarded as Gazprom’s “social responsibility.” As independent gas producers are getting dominant positions in several regional markets, they start to face the same challenge of “charity gasification.” But, at any rate, it is an important part of the social policy, and the level of gas penetration will inevitably increase.

Another promising sector of gas consumption is transportation. Currently, 243 NGV (natural gas vehicle) filling stations, serving mostly LPG, were dispatched in 69 regions, and the bulk of these were owned by Gazprom. Recently, the government adopted a special decree “On the regulation of the increase of gas use in the sector of motor fuel,”⁴⁸ prioritizing the development of gas use for the transportation sector, in particular for trains and road transport, as well as for agriculture. This decree commits to installing gas filling stations. The Ministry of Transport is envisaging a plan with subsidies to the agriculture and public transportation sectors. Various estimates put additional gas consumption by the transportation sector in a range of 2.5–3 to 7 bcm by 2020. Gazprom created a specialized company, OOO Gazprom Gazomotornoye Toplivo, in 2012 and also teamed up with truck-maker Kamaz. The objective is to expand the number of natural gas vehicle filling station networks in Russia and increasing the numbers of NGVs.

Slower domestic consumption growth, especially in this decade, adds to the situation of oversupply on the Russian gas market, leading to stronger suppliers’ competition. It is almost inevitable that Gazprom’s share of the domestic market will fall below 50%, establishing a new balance with three major players (Gazprom, Novatek, and Rosneft) and a number of more peripheral producers and marketers of gas.

Further development of the Russian gas market institutional framework will evolve through gradual changes toward improvement of competitiveness, further growth of the IGPs’ role, and

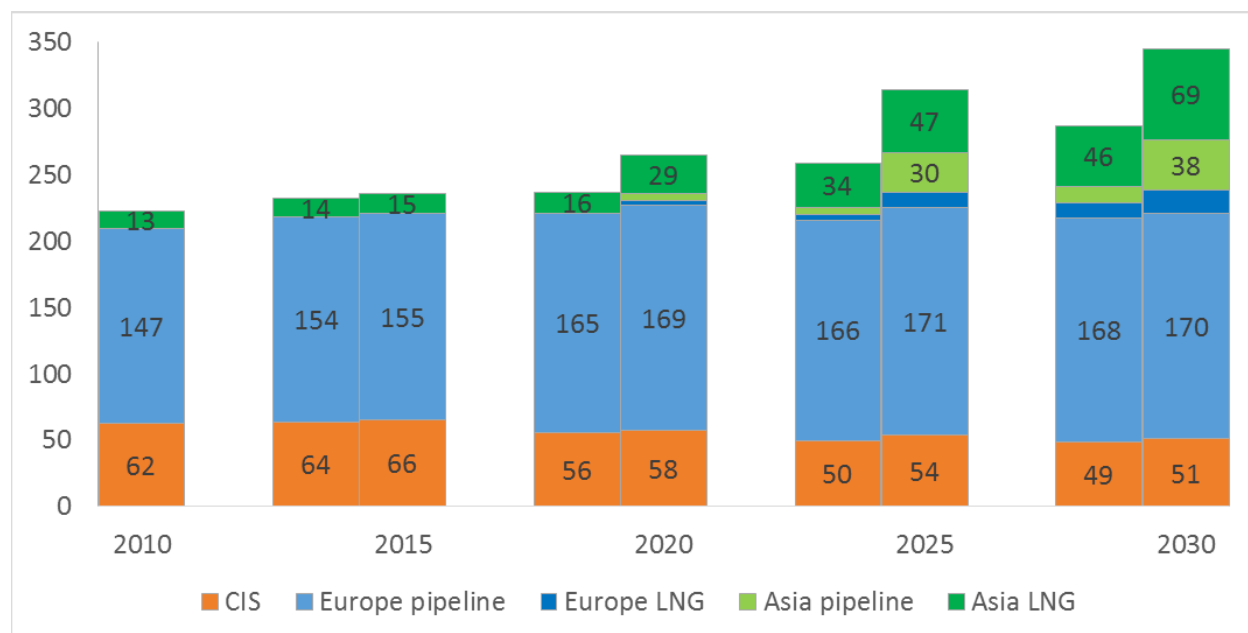
⁴⁸ Russian Government Decree No. 767 from May 13, 2013.

legal fixation of the new market structure. Periodically, the option of the UGSS spin-off from Gazprom is discussed; however, it is unlikely to happen in the favorable external environment scenarios. More likely is gradual export liberalization through implementation of the special export quotas for certain companies (Novatek and Rosneft).

Meanwhile, even in the event of implementation of the most radical option of the market reform—to unbundle Gazprom, separating out competitive and monopolistic activities (that means producing units to be spun off and converted to independent companies and spin-off of the UGSS operator)—there is no grounds for expecting that the market system will change drastically. The fact is that in any case, production assets will still be concentrated north of the Tyumen Region in the Yamal Nenets Autonomous District (where currently 89% of Russian gas is produced), and even if Gazprom production assets are unbundled, main production will be concentrated in just 2–3 of them (“Gazprom dobycha Urengoy”, “Gazprom dobycha Yamburg,” and “Gazprom dobycha Nadym”). This will only strengthen the oligopolistic structure of the domestic market, with regional monopolies being established and the state regulation continuing much as it did before.

Russian gas will continue to be exported mostly to Europe and the CIS, and the Asian route will also be developed. Total natural gas exports could increase from 223 bcm in 2010 to 290–345 bcm in 2030. In general, the share of eastward natural gas exports will increase from 6% to 32.5%, and the share of LNG will grow from 6% to 30%. In other words, exports are expected to be diversified significantly both in terms of sales markets and transportation technologies (pipeline and LNG; see Figure 41).

Figure 41. Russian Pipeline and LNG Exports in the Conservative and Breakthrough Scenarios (bcm/year)



Source: ERI RAS

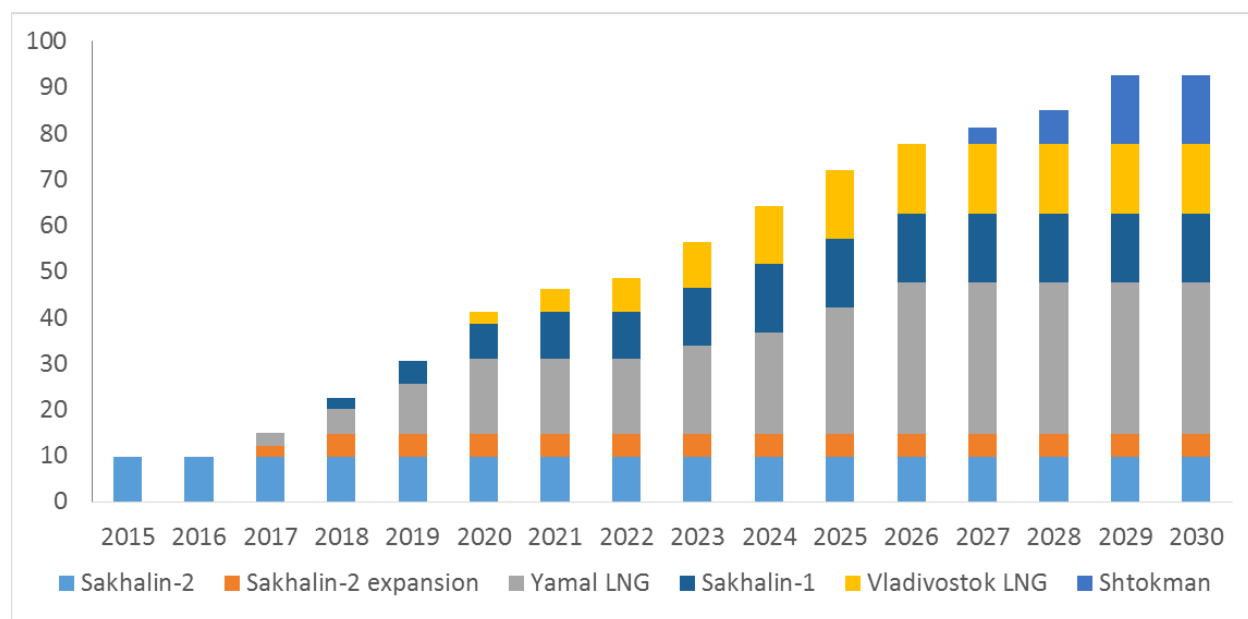
European pipeline gas exports will continue to provide for about 55–60% of total Russian exports in 2030. In the short to medium term, Russian gas exports to Europe are likely to increase on the backstage of economic recovery, tight global LNG markets, a decrease in domestic production in Europe (such as in the Netherlands and United Kingdom), and a generally tighter European gas balance. The diversification of pipeline gas supplies to the European markets from the Caspian, the Black Sea, the East Mediterranean, Iran, and Iraq are unlikely to have a major impact on Gazprom's future exports until at least 2020, although in some national markets, these additional and alternative supplies will foster competition.

In the longer term (post-2020), when new massive LNG supplies are expected (including those from North America), Russia's place in the European gas balance will depend on Gazprom and the Russian government's attitude towards pricing its gas on an oil-linked basis. In 2013, Gazprom demonstrated that it is prepared to react to this differential by renegotiating contracts and by offering rebates to mitigate any major price discrepancies. However, this is a rather reactive and risky strategy, inviting competition from lower-cost suppliers with an uncertain outcome. The impact of the Third Package could also undermine Russia's strategy to build

extensive new pipelines to the continent if they are required to offer third-party access. South Stream itself will still go ahead in some form, although it may be scaled back and plans for other by-pass projects could be curtailed. But DG Competition investigations against Gazprom could have an extremely negative effect on Russian gas sales in Europe and in certain circumstances could lead to removal of the pipeline gas export monopoly, in order to allow other gas producers to sell at least some gas in Europe.

In the FSU, the outcome is likely to remain more politically driven, with countries seeming to be prepared to pay a high price to end Russia's dominance of their energy economies. However, a rational strategy would be for Gazprom to allow its FSU customers to seek alternative sources of supply, which are unlikely to be cheap, and then price relative to them, accepting some loss of volumes but perhaps not a significant, if any, loss of revenues. The recent price discount provided for Ukraine might be the first evidence of this new strategy.

Along with gas transportation by pipelines, LNG production/transportation projects will be widely developed, to strengthen the Russian Federation's position on the external market. The government, Gazprom, Rosneft, and Novatek have rightly prioritized the development of LNG export projects to the Asia-Pacific region, and legislation has finally granted LNG export access to independent companies. Given the typical completion times for such projects globally, one can say with high certainty that reaching full capacity utilization by these projects should not be expected before 2020. As such, until then, any attempts to diversify exports with LNG will be unsuccessful, and these LNG projects will not significantly affect the Russian and global balance during this decade. In the longer term, between 2020 and 2030, Russia has considerable potential to strengthen its influence on the LNG market—Russian LNG exports could reach up to 70-90 million tons—but by this time there might be no market niche: the window of opportunity is very narrow.

Figure 42. Russian Potential LNG Capacity Expansion (million tons)

The success of Russian LNG will strongly depend on the ability of Russian market players to build up relations with different groups of foreign partners. Willing to gain a strong position on the global LNG market, Russia will have to change its gas industry regulatory framework, opening it up to competition and international cooperation.

Asian pipeline gas exports are also of critical importance for the future structure of the Russian gas industry. If Gazprom finally makes a deal with China, it is very likely that the company will retain its preeminent position in the Russian gas sector in the near future. The economic outcome for Gazprom will obviously depend upon the price negotiated with China and on Gazprom's ability to control costs and timing, at least within a reasonable margin of error, given that some level of graft is bound to occur. Novatek and Rosneft can then remain important, but secondary, players in the Russian gas sector and the Asian gas market.

The alternative scenario involves the continued inability of Gazprom to conclude a deal with China, with the delay also causing continued confusion in its LNG strategy and a consequent lack of deals. In the worst case, this could result in Russia missing the opportunity in the Asian market altogether, or at least until well into the 2020s, either because alternative suppliers of LNG and piped gas fill the available demand or because consumers and governments in Asia

turn to alternative sources of energy, including coal, nuclear, and renewables, with gas being viewed as too expensive and difficult. However, the implications of this outcome—lower budget revenues, reduced geopolitical influence in the Asian region, and loss of status in the global energy economy—make it likely that there would be a reaction in Russia if further significant procrastination over the China negotiations seem to make this conclusion a potential reality. In this case, a more radical course of events could see Gazprom's place in the East taken over by Rosneft. It has already demonstrated its ability to establish close energy relations in Asia in the oil sector, with piped sales to China and exports to the Pacific region from Vladivostok. It is not beyond the realm of possibility that it could argue its case for applying the same strategy to gas, although this would mean a radical shift in Gazprom's position and also a possible shift of eastern assets from one state company to another. This is not a likely outcome, but the mere fact that it might even be discussed demonstrates how global gas markets are affecting thinking on the Russian gas market.

Conclusion

During the last few years, the Russian economy was undergoing some fundamental changes. External and internal forces are starting to create strong imbalances, which mean that the status quo may not be able to continue. This economic fragility and obvious end of successful functioning of the resource-based model have already started to create threats to the stability of the existing political system.

The role of the gas industry for the Russian economic and political situation, now and in the future, should not be underestimated. Gas is not only the backbone of the Russian energy sector, but also one of the most powerful tools of domestic and foreign policy. It is strongly affected by the domestic economic and political processes. At the same time, the oil and gas industry itself is to a large extent defining Russian economic performance and political stability.

The Russian gas industry finds itself today at a crossroads, facing numerous challenges and dilemmas. Choices must be made in the near future—first of all the choice between market-oriented industry development with a purely economic rationale, or maintaining “strategic”

considerations as the main priority, achieved through state guidance. This decision on undertaking market reform (or, on the other hand, protecting the status quo) can be made only by the Russian political leadership and will in the longer term define its fate.

Appendix 1. Most Important Natural Gas Fields in Operation in Russia

Field	Started in	Maximum production bcm per year	Year maximum production was achieved	Production in 2009, bcm
Western Siberia				
Medvjezhie	1972	75.3	1983	14.5
Urengoy (Senomanian)	1978	276.2	1987	58.7
Vyngapur	1978	20.4	1980	1.2
Urengoy (Valanginian)	1981	34.0	1989	22.8
Yamburg (Senomanian)	1986	174.2	1994	90.6
Yamburg (Valanginian)	1991	14.1	2006	13.8
Yubileynoye	1992	21.3	2004	17.9
Komsomolskoye	1993	31.2	2002	22
Western Tarkosalinsk	1996	15.9	2005	12.4
Yamsoveysk	1997	22.3	2007	19.0
Novy Urengoy and Eastern Urengoy (Ach. group)	1998	3.1 (production estimated up to 15.6)	2006	2.5
Gubkinsk (Senomanian)	1999	15.3	2001	11.8
Western Tarkosalinsk (Senomanian)	1999	12.5	2006	9.0
Zapolyarnoye (Senomanian)	2001	105.1	2006	73.3
Northern Urengoy (Valanginian)	2001	5.0	2010	2.9
Vyngayakhinsk	2003	5.5	2004	4.9
Yen-Yaginsk (Valanginian)	2003	5.4	2007	5.0
Western Tarkosalinsk (Valanginian)	2003	3.0	2005	2.6
Khancheyk	2003	5.2	2010	3.2
Yurharovsk	2003	9.6	2006	18.0
Severo-Komsomolsk	2003	0.4	2004	0.4
Yety-Purovsk	2004	15.1	2006	13.3
Pestsov	2004	27.0	2007	19.9
Vjuzhnoye	2005	0.1	2006	0.1
Nakhodka	2005	5.4	2006	5.9
Tarasovsk	2006	1.0	2006	0.3
Yuzhno-Russkoye	2007	25.0	2009	22.6

The Geopolitics of Russian Natural Gas

Beregovoye	2007	10.5	2010	3.6
Other regions in Russia				
Vukhtylsk	1968	19.2	1976	2.5
Orenburg	1970	49.4	1985	17.1
Astrakhan	1957	12.0	2007	9.5

Source: Analysis of the condition and perspectives of oil and gas refining, oil and gas chemical industries in Russia, 2011

Appendix 2. Major Russian Gas Export Pipeline Capacities

Pipeline	Capacity	Destination of exports
Via Ukraine:		
Orenburg-Western border (Uzhgorod)	26	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Urengoy-Uzhgorod	28	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Yamburg-Western border (Uzhgorod)	26	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Dolina-Uzhgorod - 2 lines	17	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Komarno-Drozdowichi - 2 lines	5	Poland
Uzhgorod-Beregovo - 2 lines	13	Hungary, Serbia, Bosnia
Hust - Satu-Mare	2	Romania
Ananyev-Tiraspol'-Izmail & Shebelinka-Izmail - 3 lines	27	Romania, Bulgaria, Greece, Turkey, Macedonia
Total via Ukraine:	143	
Via Belarus:		
Yamal-Europe (Torzhok-Kondratki-Frankfurt/Oder)	31	Poland, Germany, Netherlands, Belgium, UK
Kobrin-Brest	5	Poland
Total via Belarus:	35	
St. Petersburg-Finland - 2 lines	7	Finland
Blue Stream (design capacity)	16	Turkey (possible to Greece, Macedonia)
Nord Stream 1 and 2	55	Germany, France, Czech and other
TOTAL EXISTING EXPORT CAPACITY:	256	
NEW PIPELINES:		
South Stream	63	Bulgaria, Serbia, Greece, Italy and other
Nord Stream 3 and 4	55	Germany, France, Czech and other
TOTAL PLANNED EXPORT CAPACITY:	374	
Contracted exports guaranteed for 2020-2025 (TOP volumes)	140	

Source: ERI RAS