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Tuuli Juurikkala and Simon-Erik Ollus

Russian energy sector – prospects
and implications for Russian growth,
economic policy and energy supply



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Bank of Finland
BOFIT – Institute for Economies in Transition
PO Box 160
FIN-00101 Helsinki

Phone: +358 10 831 2268
Fax: +358 10 831 2294

Email: bofit@bof.fi
Website: www.bof.fi/bofit

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Contents

Abstract	3
1 Oil and gas production in Russia.....	4
2 Future prospects of oil and gas production.....	9
3 Implications for energy supply in Europe	14
4 Summary and conclusions	15
References	17

Tuuli Juurikkala and Simon-Erik Ollus

Russian energy sector – prospects and implications for Russian growth, economic policy and energy supply

Abstract

Russia is a globally important oil and gas producer. Russian hydrocarbons are not only crucial to the domestic economy but also to European countries depending on energy imports. This paper reviews the current stand and future prospects of Russian oil and gas production and exports. Russia has clearly stated that it wants to diversify its oil trade by increasing its exports to other areas than Europe. At the same time, many countries have seen their gas import prices rising significantly. As energy prices and exports have also been the main driver behind the current economic boom in Russia, there is no doubt that Russian energy will stay high on both the economic and political agenda of the EU and its member countries at least in any foreseeable future. The question remains whether there is enough Russian oil and gas for all new pipelines planned, as well as whether the huge investment needs of the energy sector can possibly be fulfilled, given the current investment climate and increasing government influence in the major energy firms.

Keywords: energy, oil, natural gas, Russia, EU

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1 Oil and gas production in Russia

Russia is a globally important oil producer

As a non-OPEC member country, Russia has increased its oil production significantly during the last years. During 1998–2005, Russia's oil output growth accounted for almost 40% of the increase in world oil supply. After Saudi Arabia, Russia is the second largest oil producer in the world. In 2005, Russia accounted for 12.1% and Saudi Arabia for 13.5% of total world oil production. Russia's known reserves, however, are much smaller than Saudi Arabia's and its oil industry is still in many respects underdeveloped. Russia's known oil reserves account for only 6% of the world's known reserves, while Saudi Arabia's account for 22% (Table 1).

Table 1 The 10 countries with largest oil reserves in the world, end of 2005

Largest oil reserves	Reserves (bn.barrels)	Share of reserves, %	Production 2005 (million bpd)	R/P (years)
Saudi Arabia	264.2	22.0	11.0	65.6
Iran	137.5	11.5	4.0	93.0
Iraq	115.0	9.6	1.8	>100
Kuwait	101.5	8.5	2.6	>100
United Arab Emirates	97.8	8.1	2.6	97.4
Venezuela	79.7	6.6	3.0	72.6
Russian Federation	74.4	6.2	9.6	21.4
Kazakhstan	39.6	3.3	1.4	79.6
Libya	39.1	3.3	1.7	63
Nigeria	35.9	3.0	2.6	38.1

Source: British Petroleum (2006).

After the USSR collapsed, oil production in the former Soviet states declined significantly throughout the early 1990s. Following the 1998 financial crisis, Russian oil production started to climb again. In fact, production has increased by over 50% since 1999. Since the end of 2004, however, the production growth has slowed down. In 2005, Russia's oil production was 9.6 million barrels per day (bpd), which was still less than during the peak years of the Soviet era, and it grew by less than 3% year-on-year.

Russian oil exports are now on a much higher level than during the Soviet times. As the domestic demand decreased sharply throughout the 1990s, Russia has managed to increase its crude oil exports much faster than its production. In 1999–2004 exports grew on average by two-digit numbers annually, but as with production, a change occurred at the end of 2004. In 2005, the export volume actually fell to 5.1 million bpd, a 2% decrease year-on-year.

Russia also produces oil products, although the refining capacity in the country is small. Refining declined sharply after the fall of the Soviet Union and then started to develop slowly after 1998. The quality of the processing is also low. While Russia

accounted for 12% of world oil output in 2005, its share of refining capacity was only 6%. Most of its refined products are consumed domestically, and only a third of the refined products are exported.

Russia's domestic consumption of oil has fallen from the Soviet period. It is now approximately 60% of what it was as recently as 1992, due to the general output decline in the 1990s and the restructuring of infrastructure inherited from the Soviet Union. The share of oil in energy production has decreased. Currently, domestic consumption is increasing slowly, at an annual rate of 1–2%.

Russia holds the largest natural gas reserves in the world

In 2005, Russia held more than one quarter of the total natural gas reserves in the world (Table 2). Contrary to oil, gas reserves are expected to last long, for 80 years (see R/P ratio in Table 1 and Table 2), when compared to current production levels, despite the fact that vast majority of gas is extracted from three giant Siberian fields (Medvezhye, Urengoy and Yamburg), at least two of which have passed their peak production periods already. Production-wise, Russia accounted for 22% of the world total in 2005.

Russia is also the world's largest consumer and exporter of natural gas. Approximately two thirds of the gas produced is consumed in the domestic market, at regulated prices far lower than those at which gas is sold abroad. Residential and industrial sectors demand an almost equal share of gas used in Russia, with transport as the third major consumer. Gas is also the most important fuel in electricity production in Russia. In the future, natural gas is expected to become ever more significant domestically, as the share of gas in Russian total primary energy supply is forecast to rise from 52% in 2000 to 56% in 2030 (IEA 2004).

Table 2 The 10 countries with largest natural gas reserves in the world, end of 2005

Largest gas reserves	Reserves (trillion m3)	Share of reserves, %	Production (billion m3)	R/P (years)
Russian Federation	47.8	26.6%	598.0	80
Iran	26.7	14.9	87.0	>100
Saudi Arabia	6.9	3.8	69.5	99.3
United Arab Emirates	6.0	3.4	46.6	>100
USA	5.5	3.0	525.7	10.4
Nigeria	5.2	2.9	21.8	>100
Algeria	4.6	2.5	87.8	52.2
Venezuela	4.3	2.4	28.9	>100
Iraq	3.2	1.8	-	>100
Kazakhstan	3.0	1.7	23.5	>100

Source: British Petroleum (2006).

In the Soviet past, Russian gas exports mostly went to Eastern Europe. Today, the focus has shifted to the EU countries and Turkey, which bought 80% and 12%, respectively, of Russian exports outside the CIS in 2005. The remainder went to non-EU European countries. World energy consumption is forecast to lean more to natural gas in the future. As Russia realises some or all of its current export infrastructure development plans (see Appendix 1), exports may become less concentrated on the European continent. In the near future, however, EU countries will most likely continue to be the main importers of Russian gas.

Oil and gas in the Russian economy

The oil and gas industry is of crucial importance to the Russian economy. The increase in world oil price since 1999 has accelerated Russia's GDP growth during the present decade. According to an estimate made at the Bank of Finland a 10% permanent increase in international oil prices is associated with a 2.2% increase in the level of the Russian GDP (Rautava 2004). The international oil price has risen over sixfold from 1999 to mid-2006 (Figure 1).

Figure 1 Russian GDP growth and international oil prices 1996–2006



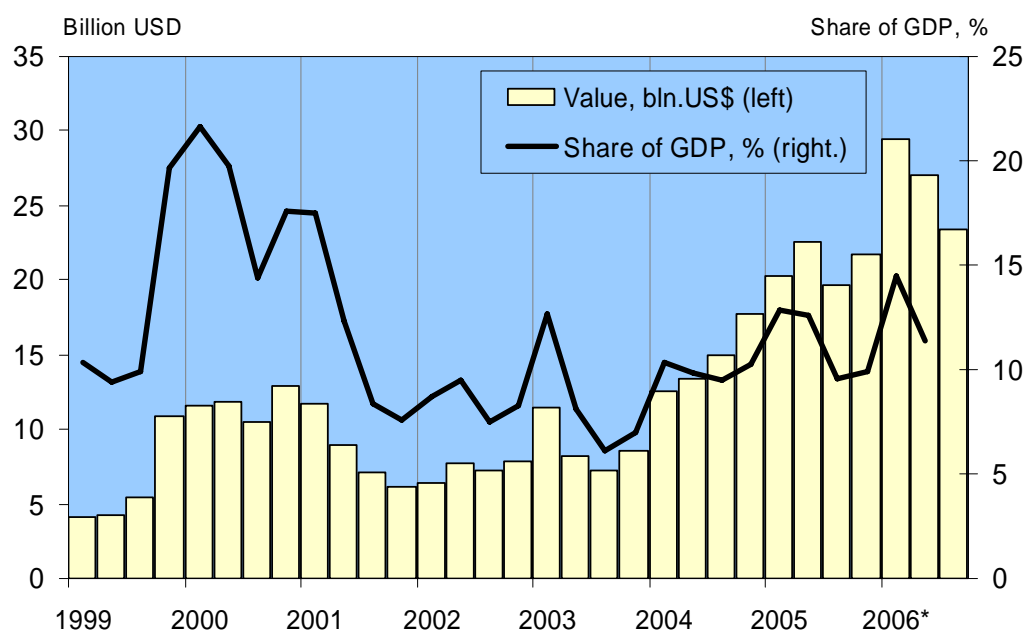
Source: Rosstat and Bloomberg

According to the Russian government, the energy sector actually accounted for about 30% of Russian GDP in 2005. Oil and gas exports accounted for 56% of Russia's total export incomes in 2005 and grew by almost 50% year-on-year. The employment effect is, however, much smaller. According to Rosstat, in 2005 only 1.6% of the employed worked in the mineral extraction sector, mostly in hydrocarbons.

As oil prices have continued to grow rapidly, export revenues have grown fast since 1999. In the first nine months of this year oil export revenues increased by nearly a third from a year earlier and accounted for 46% alone of the total value of exports. At the same

time also gas export revenues have significantly increased due to export price hikes. They grew by over 40% compared to the corresponding period in 2005. The growing export incomes fuel the economy with liquidity and keep the current account on surplus (Figure 2). In the first half of this year, the current account showed a surplus of USD 57 billion, or 13% of GDP, and the surplus is among the largest in the world. Russia is thus a major financier of global deficits.

Figure 2 Russia's current account surplus in 1999–2006



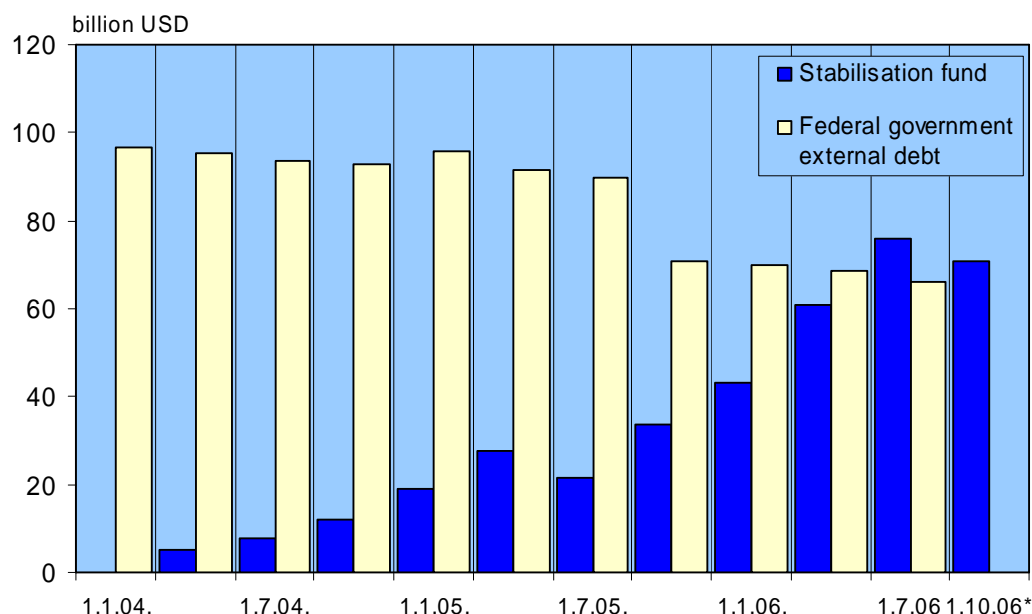
* Third quarter 2006: preliminary estimate

Source: Rosstat, CBR and MinFin

Sizeable export revenues boost the foreign exchange reserves, which amounted to USD 261 billion at the end of September 2006. Moreover, currently about half of the federal budget revenues are from oil and gas. In order to neutralise liquidity flows, Russia has since the beginning of 2004 collected a Stabilisation Fund by taxing highly the oil sector. Currently, the effective marginal tax rate on crude oil exports is approximately 90%.¹ The Stabilisation Fund has grown rapidly and in the beginning of October it accounted for USD 71 billion. It currently equals approximately the Russian federation's total external debt (Figure 3).

¹ The Russian oil sector is taxed heavily through different schemes. Added to the general taxes (e.g. VAT, profit tax and social tax) there are four sector-specific taxes for oil. First, the *mineral resource extractions tax* that taxes oil extraction. Second, the *crude oil export duty*, that is progressive to Urals oil prices. Third, *export duties on petroleum product* that is adjusted every third month. Finally, *excise duties* that are charged on gasoline, heating oil and motor oil. Large parts of the oil sector specific taxes are deposited in the Stabilisation Fund.

Figure 3 Stabilisation Fund and federal government external debt, USD billion



*Russia shortened USD 23 billion of Paris club Soviet era debt from the Stabilisation fund in August
Source: CBR and MinFin

The use of the Stabilisation Fund has raised tense political discussion in Russia. Originally the fund was meant as a 'rainy day' reserve and used to cover budget deficits if oil prices decline. The fund was expected to be somewhat larger than EUR 15 billion. However, the fund has grown much faster, due to the high oil price, and there is an ongoing discussion of the use and character of the fund. Parts of it have been used to prepay off debts, cover the deficit of the Pension Fund and establish a Federal Investment Fund that will boost investments in long-term infrastructure projects. The Stabilisation Fund has so far been in roubles on the Central Banks accounts, but in July 2006 the first part of it was invested in foreign currency securities (the decided allocation is EUR 45%, USD 45% GBP10%).

Although Russia has sterilized excess liquidity by different means, inflation remains high. Annual inflation in 2005 was 10.9% and in September 2006 it had come down to 9.5%, partly due to the small appreciation in the nominal exchange rate. Rising prices of housing, petrol and certain foodstuffs also added to inflation last year. The rouble's real effective exchange rate in January–September gained 8.1% year-on-year and is forecast to appreciate further.

2 Future prospects of oil and gas production

Oil production and export growth

Russia's oil production is likely to stay at its current high level in the near future, but there is much scepticism whether Russia can continue as such a large oil producer in the long term. Firstly, although Russia is the second largest producer of oil at the moment, it is only the seventh in terms of known reserves (see Table 1). By reserve-production ratio, Russia scores much lower than the other major producers. At the current rate, Russia would empty its known reserves in 22 years. Most experts, however, believe that Russia's actual oil reserves are much larger, as the geological research available was mainly conducted during the Soviet period. The range of estimates of the size of the undiscovered reserves is wide. The US Geological Survey 2000 concludes that undiscovered oil reserves account for about 77 billion barrels, which would double Russia's known reserves. Much higher estimates have also been presented.

The majority of known oil reserves are located in the Ural Federal District, where they are easy to access. The undiscovered oil reserves are expected to be concentrated more in the Siberian and Far Eastern Federal Districts, where the oil is also deeper in the ground. As oil wells in the Ural Federal District are drying up, oil companies are forced to look for new wells in more remote locations, but so far they have not been keen on investing in exploitation to any considerable extent.

Secondly, investments in oil production have declined during the last few years. Most private producers have focused solely on exploiting current fields. Much of the drilling is still based on Soviet-period technology, which can be up to 30 years old, and should be replaced in order to increase productivity. According to the International Energy Agency, Russia urgently needs to modernise its oil production capacity, and the Agency estimates that the oil sector needs roughly USD 14 billion annually to keep up with the modest growth projected in the country's energy strategy. Many specialists have also warned that Russia is at risk of a production crisis in the future, due to the dearth of investment in geological research.

Thirdly, recently increased state involvement in the energy sector casts doubts on the investment climate and market rules in the energy sector. The state has increased the tax burden on natural resources, especially oil, while the price of oil has been high. Tighter and more progressive tax schemes for the export of both crude oil and oil products entered into force in 2004 and are being revised in autumn 2006, which is likely to strengthen the state control of natural resources and increase tax revenues even further. However, the introduction of tighter taxation seems also to have reduced oil companies' interest in investing and especially in striving for increased exports, despite the current high world market price for oil.

The increased state involvement can also be seen as the government's response to some of the threats to oil production. It seems that the state does not trust the private sector's ability to run the sector in the interests of the state, which are to increase long-term investment, boost export growth, and provide abundant tax revenue.

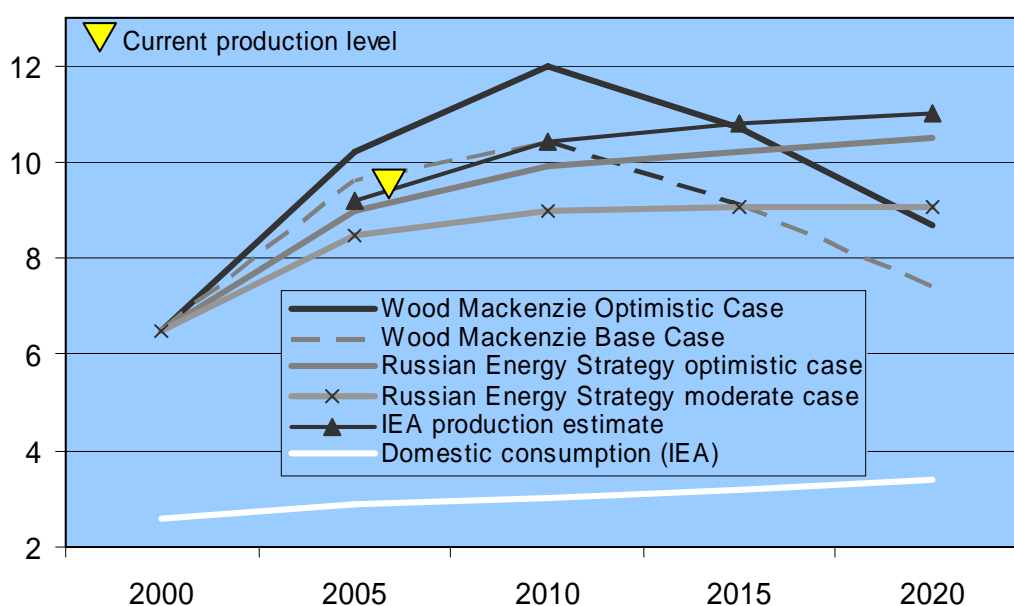
The question remains as to whether increased state involvement is good for the oil sector. This could increase investment in exploration and development, which private companies have so far largely neglected. The involvement has also increased the state's tax revenue. However, it can also have many negative consequences. The tax claims against Yukos were selective and are widely regarded as politically motivated, although other oil

companies (e.g. TNK-BP & Sibneft) also received smaller charges for tax arrears. Many observers have noted how selective law enforcement in Russia can be and how it increases uncertainty for all business in Russia.

Finally, the question of foreign involvement in Russian oil business needs to be highlighted. Increased state involvement in the sector has also included protectionist characteristics. Natural resources are seen as a Russian national treasure, or strategic sectors, and the state has become less amenable to foreign companies to exploit them. However, the state is also fully aware of the fact that only a few Russian companies have enough capital, and the required technology, for the investment needed to develop the oil sector. Therefore some albeit limited foreign involvement seems to be accepted.

Official statistics and estimates show that the growth of oil production is slowing down. However, the assumed decrease in growth in the longer term varies widely. The Russian energy strategy, approved by the government, envisages moderate growth up to 2020, while one of the most pessimistic views was expressed by the energy consultancy agency Wood Mackenzie (Figure 4). It expects Russian oil production to actually decline after 2010, based on its pessimistic prognosis for investment in production facilities and new exploration.

Figure 4 Long-term oil production scenarios, million bpd



Source: Wood Mackenzie (2004), Russian Government (2003) and International Energy Agency (2004)

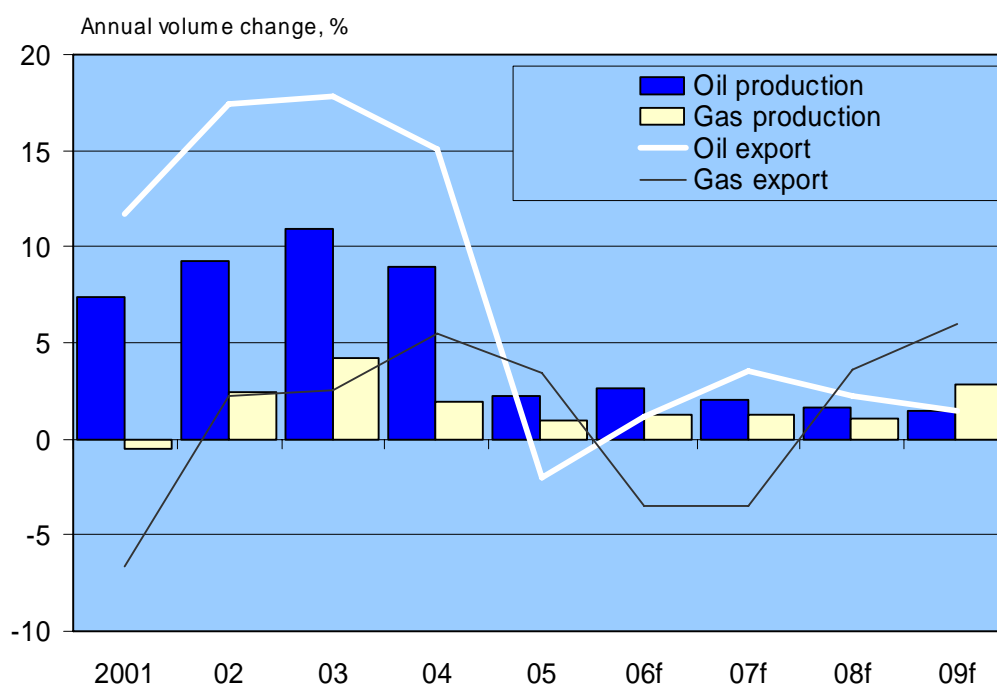
While production is still forecast to increase, domestic demand is estimated as increasing more slowly. According to the government's energy strategy up to year 2020, Russia aims to fulfil its primary energy demand mainly through coal and gas, keeping the share of oil stable.² Russian domestic demand for oil is calculated at 3.0 million bpd for 2010, 3.4 million bpd for 2020 and 4.0 million bpd for 2030. The annual increase in demand for oil is thus 1.6% in 2002–2030, with the main increase in consumption coming from the

² In the short run, the government plans to meet primary energy demand largely by nuclear power, but the projected increase for 2000–2030 is very small compared to gas and coal.

transport sector. This demand, though rising, is still low compared to demand in the Soviet period.

In its economic projections up to the year 2015, made in late 2005, the Russian Ministry of Economy forecasts both the oil and gas exports as growing by only less than 10% during the next 9 years. Reasons for this include, first, the slow production growth. Second, domestic demand is on the rise, albeit slowly. Third, there will be less crude oil to export as more oil and gas are gradually to be refined domestically (Figure 5).

Figure 5 Russian oil and gas production and export volumes 2001--2009, annual % change



Source: Russian Ministry of Economic Development and Trade, August 2006

Today, Europe is Russia's largest oil export market, and Russian oil accounts for roughly a third of the European Union's oil imports. Russia has clearly stated that it wants to diversify its oil trade by increasing its exports to other areas. This aim is revealed in plans to construct new pipelines to the Pacific Ocean and to Murmansk. According to the Ministry of Industry and Energy, Russia aims to export roughly a third of its oil outside Europe in the future. In 2004 this share was only about 7%. This aim, and the fact that Russia's export growth is declining, suggest that Russia's oil reserves will not be as significant source for Europe's increased energy needs as in recent years (Table 3).

Table 3 Russian oil export destinations

Export area, %	2004	2020F
Europe	77	64*
CIS countries	16	
America	1	18
Asian-Pacific region	6	18
Africa	0.1	
Total	100	100

*Includes European CIS countries

Source: Ministry of Industry and Energy.

The lack of export capacity, especially in state pipeline-monopoly Transneft's network, has boosted train and river exports during the last few years. In 2004, pipelines accounted for 60% of crude oil exports, while 33% was exported by rail. The pipeline-network has expanded little since the collapse of the USSR, and most of the work has aimed at reducing bottlenecks. Table 4 shows the expansion plans for the Transneft network, presented at the end of 2004 by the Ministry of Industry and Energy.

Table 4 Planned capacity of Transneft export pipeline grid, 2003–2020, volumes in millions of bpd

Transneft export pipelines	2003	2005	2010	2015	2020
Primorsk terminal (BPS)	0.6	1.2	1.2	1.2	1.2
Baltic and Polish terminals	0.1	0.3	0.3	0.3	0.3
Ukraine-Europe (Friendship)	1.3	1.3	1.3	1.3	1.3
Black Sea grid	1.3	1.3	1.3	1.3	1.3
Caspian Sea grid	0.4	0.6	1.3	1.3	1.3
Taishet to Nakhodka			0.6	1	1.6
Western Siberia to Murmansk				1	1.6
Total	3.7	4.7	6.1	7.5	8.7

Source: Ministry of Industry and Energy

To increase capacity and to get around the bottlenecks in the Bosphorus straits and the Friendship-pipeline through Ukraine to Europe, the government has planned some alternative export routes. The first new oil terminal was built at Primorsk on the Gulf of Finland. The adjacent Baltic Pipeline System is already running at full capacity. The Primorsk terminal has currently become the largest oil exporting harbour for Russian oil.

The Russian government has also pushed ahead with its plan to extend the current pipeline grid eastwards. At the end of 2004, the government announced its decision to construct an oil pipeline stretching over 4,100 kilometres from Taishet in Eastern Siberia to Nakhodka on the Sea of Japan. Transneft estimates the construction costs at some EUR 8

billion, although most experts estimate that the actual cost will exceed EUR 15 billion. The planned capacity of the pipeline is about 1.6 million bpd, which corresponds to nearly a third of Russia's current crude oil exports. The government is also considering building an offshoot from the Taishet-Nakhodka pipeline to China. A pipeline from Western Siberia to Kola peninsula (Murmansk) has also been discussed. This project would significantly reduce the cost of transport from Russian oil fields to the American markets. It is however unclear, whether the pipeline is still in the plans.

Gas production and export growth

According to the national energy strategy, natural gas production is expected to increase from the 598 billion cubic metres (bcm) in 2005 to 730 bcm under the optimistic and to 680 bcm under the pessimistic scenario by 2020. Even in the optimistic case, the annual average growth rate of Russian natural gas production from 2002 until 2020 would be only 1.4%. In comparison, Russian Institute of Energy Policy estimates that in 2010, the total supply of Russian gas would be around 730 bcm and demand 830 bcm, creating a total supply gap of 100 bcm. This estimate is based on the fact that the mature fields' production levels are declining fast, the development of the new Yamal gas fields has been delayed again, and on the assumptions that Central Asian (Turkmen, Kazakh, Uzbek) imports' growth is limited, European demand grows fast, Chinese liabilities build up and domestic demand grows 2.5% annually

The monopoly position of Gazprom is one reason for pessimistic near-term growth projections. Critics have long called for restructuring of this company giant, currently one of the 10 biggest in the world judged by market capitalisation, but any serious efforts of the Russian government of actually taking up this task are yet to be seen. Furthermore, due to artificially low gas and electricity prices at home, Gazprom faces an inadequate cash flow for any large infrastructure improvements. Thus serious lack of restructuring and investment plague efforts to increase gas exports to any considerable extent.

Although arguments here also vary, the current infrastructure probably cannot handle any sizeable increases in export volumes of gas either. Any new infrastructure will take years and resources to build, though many plans exist (see Appendix 1 for a list of projects). E.g. the construction costs of the LNG (liquefied natural gas) terminal Gazprom plans to build near St Petersburg are estimated at some USD 1 billion. To this need to be added the cost of ships suitable for LNG transportation, plus the costs for the buyers of building the re-gasification facilities in the receiving end.

Furthermore, the new planned export capacity should be filled with gas not shown in the official production growth estimates. The new export pipeline plans listed in Appendix 1 together indicate the need for up to 135–155 bcm of additional gas annually. Also, there are uncertainties involved even in those projects that have already proceeded the farthest. For instance, the North European Gas Pipeline between Russia and Germany would pass through the economic area of Finland and Sweden, implying that an environmental impact evaluation has to be conducted and approved before anything can be built. Especially Sweden has expressed its intentions to scrutinize the matter closely.

According to the US Energy Information Agency, all major consumers (including the EU, the US, India and China) expect to increase their consumption and import of gas in the next two decades. The world consumption of natural gas is expected to increase by nearly 70% from 2002 to 2025. At the same time, both the total former Soviet Union demand and

production are forecast to grow slightly over 2% annually. Globally, Qatar, Algeria, Iran and Russia are expected to provide most additional gas. Qatar alone should account for almost one quarter of the increase in inter-regional gas trade between 2004 and 2030, Russia for less than 10% (IEA 2006).

3 Implications for energy supply in Europe

High oil price and supply uncertainties have led many countries trying to diversify their energy sources and in the long term decrease their demand for oil. Though the recent oil price peak is also driven by supply uncertainties, basically the price is driven by the rapid growth in consumption of both emerging markets like India and China and traditional markets. The world crude oil supply grew only by 1% in 2005. In fact the fastest growth was gained in the former Soviet states and especially Russia. Despite the significant recent slowdown in growth of production, Russia still has a role in increasing world supply of oil.

According to the US Energy Information Agency, the world consumption of oil is expected to increase by 34% from 2004 to 2025 (EIA 2006). The situation is different in Europe. Currently, 38% of the EU energy consumption is based on oil and in 2025 the forecasts assume the share to stay largely the same. Oil consumption in the 25 EU countries (EU25) is estimated by the Commission as growing only by 3% in the whole period of 2005-2025 (EUCOM 2005).

Norway, the second largest oil provider to the EU25 after Russia, faces declining production levels. Norwegian oil production has decreased on average by 3% annually in 2002-2005. Libya and Saudi Arabia (3rd and 4th largest providers of oil for the EU25), have increased their production by 4.7% and 4.6% annually in the same period. Due to the fact that North Sea oil production has reached its peak, EU oil imports will grow faster than consumption in the future. Saying what will happen to Russia's share in EU imports is difficult, but probably it will not change much. But clearly, Russia is not an inexhaustible source of oil.

Western Europe's reliance on imported gas is projected as growing from one-third of total gas consumption to 50% in 2025, respectively. EU25 gas consumption is projected as growing by 39% in 2005-2025 (EUCOM 2005).

In Western Europe plans to rely on producers whose gas would need to be imported in liquefied form are constrained by necessary infrastructure investments in LNG terminals and special ships, and also burdened by security and environmental risks. In addition to the EU also countries like the US, China, India and Japan compete for the same supplies. Some growing gas producers pose major political risks compared with Russia.

Many infrastructure projects have been suggested. On one hand, there is a perceived need to reduce dependency on Russia in energy transports from Central Asia. On the other hand, Russia wants to decrease its dependency on transit countries. At the same time Gazprom, while keen to maintain its monopoly transit position in Russia, has a commercially natural but in many eyes politically problematic goal of extending downstream, both to control pipelines and enter retail markets increasingly. If at all, the liberalisation of entry to Russian pipelines and Gazprom's entry downstream can be reached as parts of the same solution.

There is no world market price for gas, which is not a fungible commodity. Russia has through Gazprom maintained price discrimination, based both on purchasers' wealth

and, at least previously, some political considerations. Generally, new EU member states have paid less than the old ones. This seems to be changing, which has consequences both for cost levels and perceived need to diversify supplies.

4 Summary and conclusions

Though often lumped together, the oil and gas sectors differ much in characteristics. The oil sector is larger and more export oriented. It brought 46% of all export revenue in the first half of 2006, while gas sector brought 14%. On the other hand, Russia's oil reserves are smaller relative to production than its gas reserves, which are the largest in the world. Well managed, the gas sector's significance in the economy will increase.

Despite recent actions, the oil sector remains to a large extent privately owned, while the gas sector is nearly fully state owned. After a steep decline in the 1990s, oil sector volumes grew rapidly until 2004, while the gas sector, which never experienced a similar collapse, has only grown modestly. The oil sector, producing a fungible commodity, is of global importance while the gas sector is of importance for regions close to Russia. The emergence of LNG will only slowly change this.

Russia's energy is and will remain important for the European Union. Both for oil and gas, Russia is the largest provider to the EU25. The EU25 have benefited from the increases of Russian oil and gas exports during the last decade. For oil, if the need is perceived, diversifying supplies is in practice easier and cheaper than for gas, due to different infrastructure requirements.

The Russian side of the equation also provides potential problems. Crude output is expected to grow modestly at best, while – barring very major improvement in domestic energy efficiency – domestic consumption increases. It is not self-evident that Russia will increase its export volumes of crude oil, at least significantly. Investments are badly needed in the sector. For close on the last twenty years, the Russian oil industry has generally focused on production – rather than development and exploration – due to the unstable investment climate, political instability and high taxation of oil. This lack of upstream investment has had a negative effect on the medium and long term development of the oil sector. There are doubts about the sustainability of even current Russian oil production, as reflected in the reserve to output ratios mentioned above. There are also immediate-term problems with developing the pipeline network. Oil companies have often complained that the existing pipeline monopoly places heavy constraints on their export potential.

The doubts are somewhat similar for the gas sector. The sector is dominated by a state monopoly, Gazprom, whose track record and prospects have been much debated. According to one view, Gazprom prevents market reforms in the sector and uses its monopoly position ruthlessly, either for economic or political goals. Another view sees Gazprom having improved its corporate management and argues that it is not at all evident how the potential liberalisation of the sector might proceed. It is also politically difficult to raise domestic gas prices, where most gas is sold. Even in the corporate interest, Gazprom will therefore continue to put pressure on international prices. There is a major lack of investment also in the gas sector. And even if production were to increase, transit will continue to raise a variety of problems. Though Russia's aim to diversify its export markets – and to move downstream – is economically justified, it poses a number of problems, not

least for the largely gas-based energy strategy in terms of which EU countries have generally been thinking.

There is no doubt that EU-Russia energy relations will remain on the agenda. One forthcoming decision is to what degree gas should be treated as a commodity among others, best left for market operators to handle. Or would it be wiser to increase the political character of energy markets further, and aim at a situation where the EU would be a single operator, negotiating directly on prices, volumes and investment. Where might the required competencies lie? How realistic would it be, given the differences in endowments, inherited infrastructures and well-established policy goals, to aim at a common energy policy that would reach beyond some regulatory and infrastructural harmonisation?

Russia has benefited greatly from recent energy prices, both economically and politically. The world has also benefited from recent growth in Russia's hydrocarbon, especially oil production. Overall, Russia has managed its newly-emerging wealth well so far. Both Russian manufacturing and service production are now growing faster than energy extraction. Hydrocarbon production is expected to continue to grow modestly at most. This tends to depress aggregate growth, while perhaps putting it on a more robust foundation in the long run.

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Appendix 1

Planned oil pipes

1. Baltic pipe, 2nd phase (Energy strategy 28.8.2003)
 - 1st and 2nd phase together 62 million t/ year
 - ready in 2006
2. West Siberia – Kola peninsula (Energy strategy 28.8.2003)
 - to the US market
 - 2 800–4 000 km
 - 120 million t/year (80 t/year by 2020)
3. East Siberia–Pacific Ocean ESPO
 - to Japanese and Far East markets
 - 4 200 km
 - 50 million t/year
 - ready by 2010
4. East Siberia –Daqing (China)
 - 2 100 km
 - 30 million t/year
 - ready by 2010
5. Combining Druzhba and Adria pipelines
 - adds export capacity to the Mediterranean by 15 million t/year

Planned gas pipes

6. Russia-Turkey 'Blue Stream'
 - Gazprom, ENI
 - 1 200 km
 - is ready
 - capacity by 2010 from the current 4,5 to 16 bn m3/year
7. North-European Gas Pipeline NGP
 - Gazprom, BASF, E.ON; contract 8.9.2005
 - 1 200 km
 - 27,5 bn m3/year
 - ready by 2010
8. NGP 2. phase
 - 27,5 bn m3/year
 - ready by 2013
9. West Siberia-China (RBK 3.8.06)
 - Gazprom, CNPC; contract 21.3.2006
 - 3 000 km
 - 30–40 bn m3/year
 - ready by 2011
10. East Siberia--China (Jamestown 31.3.06)
 - Gazprom, CNPC; contract 21.3.2006
 - 30–40 bn m3/year
 - ready by 2011
11. Russia–Serbia (Turkish Daily News 29.7.06)
 - Gazprom, Srbijagas
 - 400 km
 - 20 bn. m3/year

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