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Russian Gas and European Energy Security

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Russian Gas and European Energy Security

Gas delivery via pipeline creates a European regional gas market which few non-European suppliers—above all Russia and Algeria—dominate, with only Iran having the potential to become the third major supplier. Production of natural gas in Europe will decrease, whereas consumption will increase, therefore the need for imports will grow. European import demand will hinge significantly on future EU policies in the field of energy saving, energy efficiency and the reduction of greenhouse gases. The more Europeans make use of renewable energies (including biomethan), nuclear energy or zero-emission coal power stations, the less they will consume and the less they will have to import natural gas from Russia.

The overwhelming part of Russian gas production is located in western Siberia and in the European part of Russia, whereas production in eastern Siberia and the Far East is only about to begin. To stabilise production in West Siberia, it is necessary to bring new fields into operation, above all on the Yamal Peninsula and in the Barents Sea. The conditions for gas production and gas transport on Yamal are challenging because of difficult soil conditions. Global warming can cause additional difficulties, because the permafrost soil may thaw and gas installations and pipelines will need stronger foundations. For all those reasons, it is questionable whether the big development projects on Yamal and in the Barents Sea (Shtokman) will go on as planned. If, for example, they will be delayed by five years, gas production in western Siberia, including Shtokman and Yamal, will stagnate at the 2010 level or even decrease, and an increase of exports to Europe will become impossible.

While in the seventies gas from Russia had been regarded as a safe alternative to the precarious energy imports from the Middle East, a newly inflamed discussion gives the impression that Russian power and influence endangers European energy security. One of the main arguments is the alleged “asymmetric dependency” of Europe from Russia in the gas sector. The procurement of natural gas by pipelines admittedly offers nearly no possibilities to change suppliers and therefore an interruption of deliveries would have considerable consequences for consumers. But the dependency is two-sided: Neither the supplier nor the recipient can change its partners. Therefore, a dis-

continuation of deliveries is detrimental to both sides. The negative consequences for the Russian side would be still more serious than for Europe, because Europe's share in Russian gas exports is more than 90 per cent, while Russia's share in European gas imports is only about 60 per cent, with a decreasing trend.

The endeavours of the EU to create a "southern gas corridor" (the "Nabucco" project) reveal the limitations and weaknesses of the European energy foreign policy. There is a high probability that they have made Russian Gazprom not only extend its "Blue Stream" gas pipeline to southern Europe, but also announce the construction of a second offshore pipeline across the Black Sea—the "South Stream" pipeline to Romania. Europe and Russia are reacting reciprocally to perceived threats, thus creating still more threat perceptions on both sides. They find themselves in a "perception trap", which has caused a "diversification race" between the EU and Russia. At the same time, both sides are ignoring that the choice between different pipeline routes should be the task of the interested companies, which have to balance profitability and risk, in spite of political wishes. Therefore, the EU Commissions' current practice of identifying priorities for new transport infrastructure and formulating them as quasi-governmental projects should be questioned.

The future of the Russian gas supply capability depends primarily on the speed of development of the Yamal gas deposits. Even though Europeans can not influence this process, they can demand more transparency about Gazprom's investment plans. Likewise, this should become a topic of the EU-Russia energy dialogue; this dialogue, supplemented by EU dialogues with the transit countries, could support the EU external policy. It should concentrate on mutual information and the launch of concrete and far-reaching energy efficiency projects.

Gas, Energy Security and Energy Foreign Policy

European consumers receive about three-quarters of their natural gas by pipelines, and the remaining part in the form of liquefied natural gas (LNG). Even though the share of LNG imports of overall imports will increase, the share of the less expensive pipeline gas will prevail in the long run. Gas delivery via pipeline creates a European regional gas market which few non-European suppliers—above all Russia and Algeria—dominate, with only Iran having the potential to become the third major supplier. Therefore, the question of gas dependence on companies and states outside Europe is raised more urgently as in the case of oil and hard coal, which are traded on a worldwide basis.

Production of natural gas in Europe will decrease, whereas consumption will increase, therefore the need of imports will grow. The volume of this increase depends on different factors, among others on political decisions. This is why statements about the future import dependency are only conditionally valid. The European Commission writes in its main document on the European energy policy: "Reliance on imports of gas is expected to increase from 57 to 84 per cent by 2030." This proposition is limited by two premises:[1] Firstly, it refers to the EU-27 (the EU without Norway), whereas the import dependency of Greater Europe is clearly less, if Norway is counted as an European country.[2] Secondly, in this document a "Business-as-usual" policy is assumed, whereas the EU intends an increase of energy efficiency and more use of renewable energies. If this policy will succeed, European import dependency would clearly increase less as the "standard prognoses" assume.

The EU Commission deduces from the increasing import dependency "political and economic risks".[3] It regards some energy-exporting countries as politically unreliable, but without elaborating this point further. The Commission, which is generally referring to the International Energy Agency (IEA), regards a growing gap in energy supply as the most threatening economic danger. With this hardly sufficient threat analysis, the Commission tries to justify a European common energy policy and external energy policy for the purpose of greater energy security.

In the EU action plan, the European foreign energy policy is formulated under the headline "Solidarity between Member States and security of supply for oil, gas and electricity".[4] This document claims solidarity mechanisms in the case of supply crises and further diversification of energy imports. EU members should ease the cross-border access to strategic gas storages for their companies and promote the construction of LNG terminals. Furthermore, a net of "energy experts" has been created and four European co-ordinators for interregional infrastructure projects have been nominated, one of them for the "Nabucco" pipeline. The EU-Russia and EU-Ukraine energy dialogues will be supplemented by dialogues between the EU and additional countries.

The endeavours of the EU to create a "southern gas corridor" (the "Nabucco" project) reveal the limitations and weaknesses of the European energy foreign policy. There is a high probability that they have made Russian Gazprom not only extend its "Blue Stream" gas pipeline to southern Europe, but also announce the construction of a second offshore pipeline across the Black Sea—the "South Stream" pipeline to Romania. Europe and Russia are reacting reciprocally to perceived threats, thus creating still more threat perceptions on both sides. They find themselves in a "perception trap", which has caused a "diversification

1 Commission of the European Communities, *Communication from the Commission to the European Council and the European Parliament. An Energy Policy for Europe*, (SEC (2007) 12), Brussels, January 10, 2007, p. 3, http://eur-lex.europa.eu/LexUriServ/site/en/com/2007/com2007_0001en01.pdf.

2 If Norway is treated as an internal supplier, the import dependency of Europe in 2005 was about 40 per cent. It will increase under a "business as usual" policy till 2030 to about 70 per cent. See Commission of the European Communities, *Annex to the Green Paper – "A European Strategy for Sustainable, Competitive and Secure Energy. What is at Stake – Background Document"*, (COM (2006) 317/2), p. 24, http://ec.europa.eu/energy/green-paper-energy/doc/2006_03_08_gp_working_document_en.pdf.

3 Commission of the European Communities, *Communication from the Commission* [see n. 1], p. 4.

4 Ibid., p. 10.

race" between the EU and Russia.[5] At the same time, both sides are ignoring that the choice between different pipeline routes should be the task of the interested companies, which have to balance profitability and risk, in spite of political wishes. Therefore, the EU Commissions' current practice of identifying priorities for new transport infrastructure and formulating them as quasi-governmental projects should be questioned.

5 Andrew Monaghan, *Russian Oil and EU Energy Security*, Conflict Studies Research Centre, Wilts, UK, November 15, 2005 (Russian Series 05/65), p. 9, www.defac.ac.uk/colleges/csrc/document-listings/russian/.

European Gas Demand and Russian Gas Export Potential

Differing Forecasts for European Import Demand

Different statistical sources use different definitions of "Europe".

> Here "Europe" means the territory to the west of the CIS, including Norway, Switzerland, the Balkans and Turkey, comparable to an extended European Union of more than 30 countries. Also "OECD-Europe" (the European OECD states) comprises a similar territory.

Forecasts of the future gas demand are affected by considerable uncertainty due to, among others, unreliable assumptions about the development of the gas price and the shaping of climate policy. If the current system of price formation continues, the gas price will crucially hinge on the oil price.[6] The higher the price of natural gas, the stronger the substitution of gas by coal and renewable energies will be. Depending on the strategies of climate policy, natural gas will either be regarded as a relative CO_2-poor surrogate fuel for coal and crude oil or be replaced by renewable energies.[7]

The Energy Information Administration (EIA) and the International Energy Agency (IEA) forecast for OECD-Europe a nearly linear increase of gas demand, as does the global gas world model of Seeliger.[8] Yet the studies on the European gas market, which were made on behalf of the EU, forecast in their basic scenarios for the time after 2010 a decreasing growth rate of gas demand.[9] The scenarios, which assume efficiency growth and use of more renewable energies, forecast a stagnation of gas demand after 2015.[10]

If a linear demand growth is implied, between 2004 and 2030 gas demand will grow by 300 billion cubic metres (bcm).[11] On the other hand, the forecasts which imply a policy change in the energy field account for a demand growth of only 50 bcm in the decades to come. The gap between the two approaches is of the same magnitude as the gas export volume of either Russia or Africa and is therefore of considerable importance for Europe's supply situation.

But what are the arguments of the more modest demand forecasts? The big unknown in the calculations is the amount of future use of natural gas for electricity production, which again depends on the prices of gas and emission certificates. Some special studies which analyse the electricity sector anticipate a minor growth of gas use in electricity production. For example, Anouk Honoré refers to the fact that current investment plans foresee a strong increase of gas power capacities only in Spain and Italy, but not in the rest of Europe.[12] The consulting firm Booz Allen Hamilton believes that high gas prices will make investment in gas power plants and the operation of existing ones unprofitable and will lead to their substitution by coal plants.[13] Also, the EU energy studies say that as a consequence of an ambitious energy-saving policy and a continuous transition to renew-

6 Energy Charter Secretariat, *Putting a Price on Energy. International Pricing Mechanisms for Oil and Gas*, Brussels 2007, www.encharter.org/index.php?id=218.

7 The specific CO_2 emissions of natural gas are only half of those of brown coal (200 g/kWh compared to 400 g/kWh).

8 Energy Information Administration, *International Energy Outlook 2007*, Washington, D.C., 2007, www.eia.doe.gov/oiaf/ieo/; Andreas Seeliger, *Entwicklung des weltweiten Erdgasangebots bis 2030*, Munich: Oldenbourg Industrieverlag, 2006 (Schriften des Energiewirtschaftlichen Instituts, vol. 61).

9 Leonidas Mantzos/Pantelis Capros, *European Energy and Transport Trends to 2030. Update 2005*, p. 25, www.ec.europa.eu/dgs/energy_transport/figures/trends_2030_update_2005/index_en.htm; Manfred Hafner, *Gas Corridors between EU and Neighbouring Countries*, Brussels, December 12, 2006, p. 7, www.ecn.nl/en/ps/research-programme/energy-markets/encouraged/final-meeting/.

10 Hafner, *Gas Corridors* [see n. 9], "Low-demand" scenario, p. 7; Mantzos/Capros, *European Energy* [see n. 9], scenarios "Energy Efficiency" and "Renewables", pp. 53ff., www.ec.europa.eu/dgs/energy_transport/figures/scenarios/energy_efficiency_en.htm; Booz Allen Hamilton, "Internationaler Gasmarkt. Wachstumsprognose zu optimistisch", press statement, May 3, 2007, www.boozallen.de/presse/pressemitteilungen/pressemitteilung-detail/35072976.

11 1 bcm = 10^9 cubic metres.

12 Anouk Honoré, *Future Natural Gas Demand in Europe. The Importance of the Power Sector*, Oxford, January 2006, p. 86, www.oxfordenergy.org/pdfs/NG10.pdf.

13 Hamilton, "Internationaler Gasmarkt" [see n. 10].

able energies, gas demand in electricity production will only grow modestly compared to 2005.[14]

All forecasts concordantly state that Europe's own natural gas production will decrease. If Norway is included, gas production of Europe amounted to nearly 300 bcm in 2005, which corresponded to about 60 per cent of European gas demand. Till 2030 natural gas production will decrease to 200–250 bcm because of depletion of the North Sea fields.

As a consequence of a relatively low European import demand, Liquefied Natural Gas (LNG) from Africa and the Middle East would be redirected to North America and South East Asia. Investment in new LNG terminals would slow down and the implementation of the planned pipelines from the Caspian region and Iran ("Nabucco") might become doubtful.

The Alternatives to Russian Gas Supply

In the case of the standard demand scenario, Russian gas alone will not match the additional gas demand of Europe. Other countries besides Russia will supply Europe with growing volumes of natural gas. In particular, gas imports from Africa will rise, and in 2020 they will reach the magnitude of the imports from Russia, partially in form of LNG. On the other hand, imports from the Caspian region will only play a subordinate and indirect role for European gas supply by substituting Russian gas in the domestic market.

Table 1
Potential Gas Exports to Europe (billion m³)

From:	*2005*	*2010*	*2020*	*2030*
North and South America	1	6	6	6
Caspian Region	0	0	13	13
Middle East	7	44	108	143
Africa	78	137	201	226
Russia	139	166	196	207
Total	**225**	**353**	**524**	**595**

Source: Manfred Hafner, *Gas Corridors between EU and Neighbouring Countries*, Brussels, December 12, 2006, www.ecn.nl/en/ps/research-programme/energy-markets/encouraged/final-meeting/.

14 The long-term development of the energy corridors to Europe have been studied in the framework of a research contract of the European Commission (ENCOURAGED-Project), see www.encouraged.info/. The results for the gas sector have been compiled by Manfred Hafner of the Observatoire Méditerranéen de l'Energie, see Hafner, *Gas Corridors* [see n. 9].

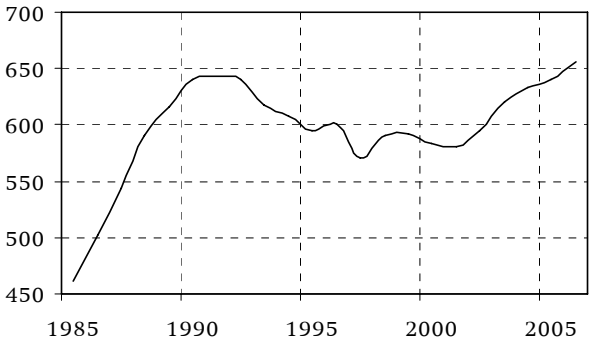
The growing share of gas imports from Africa and the Middle East will lead to a higher degree of regional diversification of imports. Russian import share will decrease from the current 60 per cent to less than 40 per cent.

Forecasts of Russian Gas Production and Gas Export Potential

Russian gas production

Russian gas production preliminarily peaked at the level of nearly 650 bcm at the time of the break-up of the Soviet Union.[15] In the nineties, it decreased by about 10 per cent because of organisational problems of the transition period and because of temporarily low gas demand in former Soviet countries. But in 2006 it reached 656 bcm and exceeded its record of 1991.

Figure 1
Gas Production in Russia 1985–2006 (billion m³)



Source: Russian Statistical Agency (Goskomstat Rossii).

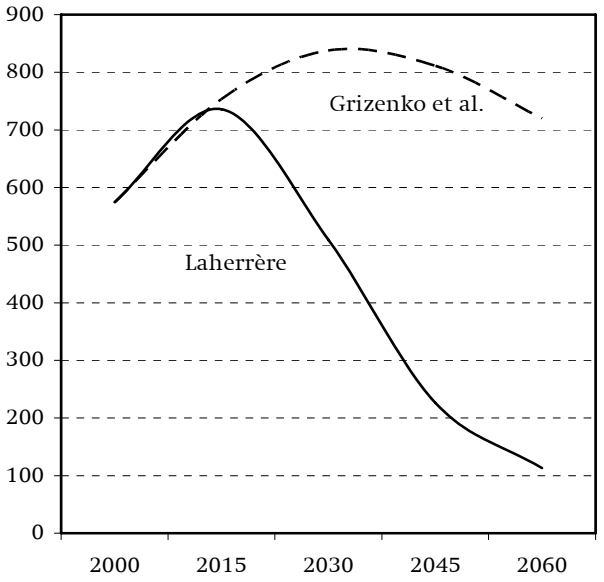
The future of Russian gas production can not be deduced from past developments, but must be based on the production potential (proved reserves and estimated resources) as well as on the speed of opening up this potential. Because the assessment of the production potential is based on assumptions about the probability of the volumes of single gas deposits, a strong subjective element is included. So it is not

15 These gas production data are taken from Russian official sources and contain natural gas as well as associated gas. Gas volumes in Russia and CIS countries are measured at 20°C (instead of 15°C) and because of the bigger volumes resulting from the higher temperatures, it accounts for volume data 7 per cent higher than the data of the BP Statistical Review of World Energy.

surprising that the available long-run estimates of the Russian gas potential differ considerably.

Jean Laherrère of the Association for the Study of Peak Oil and Gas calculates a gas potential of 43 trillion cubic metres[16] (tcm) and forecasts a peak production in 2015, which is followed by a sharp production decline.[17] A Russian team of authors (Grizenko et al.) calculates a potential of 100 tcm, whereas the German Federal Institute for Geosciences and Natural Resources estimates a potential of 130 tcm.[18] Gazprom's deputy chairman Ananenkov even spoke of 250 tcm.[19] Corresponding to their differing estimates, the long-run forecasts of Laherrère and of the Russian team assume different production profiles.

Figure 2
Gas Production in Russia 2000–2060 (billion m³)



Sources: Jean Laherrère, *Uncertainty of Oil & Gas Supply and Demand?* Potsdam, January 18, 2007, www.hubbertpeak.com/laherrere/GPPI200701.pdf; Aleksandr Grizenko et al., "Neft' i gaz Rossii v XXI g.", in: *Mineral'nye resurcy Rossii*, (2001) 3, www.geoinform.ru/mrr.files/issues/articles/pdf/gric3-01.pdf.

Apart from the aforementioned long-run analyses, there exist a number of middle-range forecasts for Russian gas production. They reveal, based on different data and parameters, a scope of production between 650 and 730 bcm already for 2010 and between 700 and 1000 bcm after 2025. This yields a stronger correspondence with the long-run forecast of the Russian team compared to those of Laherrère.

The overwhelming part of Russian gas production is located in western Siberia and in the European part of Russia, whereas production in eastern Siberia and the Far East is only about to begin. To stabilise production in West Siberia it is necessary to bring new fields into operation, above all on the Yamal Peninsula and in the Barents Sea (see figure 3, p. 12).

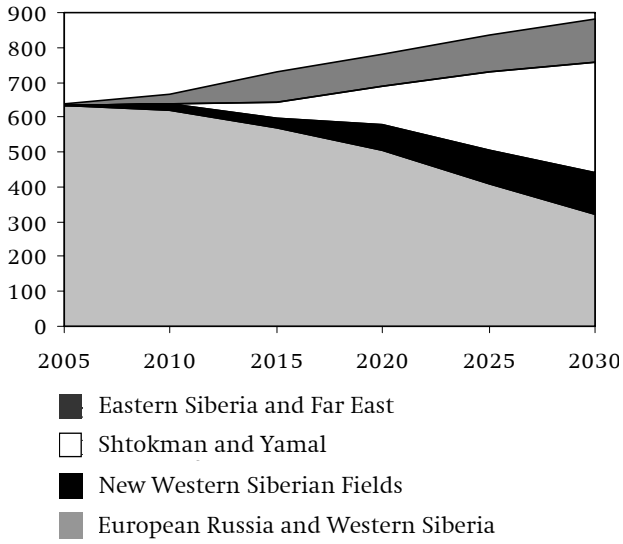
Because Yamal contains the biggest still untouched gas reserves of Russia, its development is crucially important for Europe. Gazprom plans the start of industrial production on Yamal in 2011, beginning with the giant Bovanenkovo field. Production on Yamal and in the shelf of the Kara Sea is scheduled to rise to 250 bcm by 2028.[20]

The conditions for gas production and gas transport on Yamal with its many rivers and shallow lakes are challenging because of difficult soil conditions. Global warming can cause additional difficulties, because the permafrost soil may thaw and gas installations and pipelines will need stronger foundations. For all those reasons, it is questionable whether the big development projects on Yamal and in the Barents Sea (Shtokman) will go on as planned. If, for example, they will be delayed by five years, gas production in western Siberia, including Shtokman and Yamal, will stagnate at the 2010 level or even decrease, and an increase of exports to Europe will become impossible (see figure 4, p. 12).

Calculated in 2004 prices, production installations will account for US$25 billion, pipeline costs will amount to $39 billion; so together with other expenses, total investment for the Yamal development will total $70 billion.[21] Investment in the whole gas industry of Russia in the period up to 2030 will account for $440 billion (2005 prices), including up to $195 billion for pipelines, $142 billion for production facilities, $38 billion for exploration, $58 billion for gas pro-

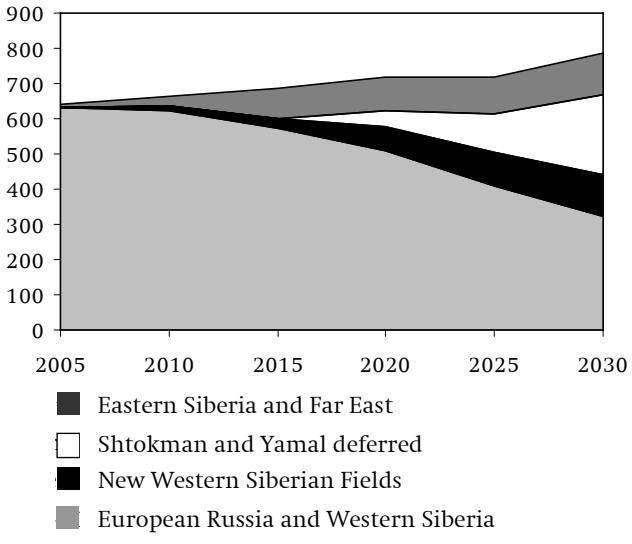
16 1 tcm = 1012 cubic metres.
17 Jean Laherrère, *Uncertainty of Oil & Gas Supply and Demand?* Potsdam, January 18, 2007, www.hubbertpeak.com/laherrere/GPPI200701.pdf.
18 Federal Institute for Geosciences and Natural Resources, *Annual Report Reserves, Resources and Availability of Energy Resources 2005*, Stuttgart, February 21, 2007, p. 57, www.bgr.bund.de/.
19 Alexander Ananenkov, press conference, June 14, 2007 (in Russian), www.gazprom.ru/articles/article23970.shtml.
20 "Gazprom", in: *Firm Magazine* 1–2 (2007): pp. 6–9, www.gazprom.ru.
21 Simon Pirani, *The $69 Billion Question: When and How to Go Ahead with Yamal*, October 2004, www.quintessential.org.uk/SimonPirani/gm-oct04.html.

Figure 3
Gas Production in Russian Regions 2005–2030 (billion m³)



Source of data: Tatiana A. Mitrova, Energy Research Institute of the Russian Academy of Sciences, Lecture at the ETH Zürich, March 10, 2007.

Figure 4
Gas Production in Russian Regions 2005–2030, Deferred Case (billion m³)



Source of data: Mitrova [see fig. 3], and own calculations.

cessing installations and $7 billion for gas storages.[22] This means an amount of $18 billion per year. This sum seems to be sustainable only under the condition of persisting high oil and gas prices.[23]

Imports and domestic consumption

Russia currently imports natural gas from the Central Asian CIS countries Turkmenistan, Kazakhstan and Uzbekistan. It is then exported to Belarus, Ukraine and Moldova. But the future of Russian gas imports is at risk, because China and Europe will gradually become rivals for Central Asian gas. Therefore, some forecasts assume a decrease of Russian gas imports.

Gazprom is strongly interested in the continuation and expansion of its gas imports, above all from Turkmenistan. According to the "25-years-treaty" of 2003, Turkmenistan has to deliver 50 bcm p.a. between 2007 and 2009 and up to 90 bcm p.a. thereafter.

22 Elena Mazneva/Irina Reznik, "Gazoviki napisali sebe investprogrammu", in: *Vedomosti*, April 16, 2007.
23 The investment volume of Gazprom in 2006 was $13 billion (without investment in oil- and gas condensate activities), OAO Gazprom, *Financial Report 2006*, p. 67, www.gazprom.com/eng/articles/article20163.shtml.

On the other hand, Turkmenistan plans to export up to 30 bcm per year to China by means of a pipeline which will be brought on-line in 2009. Iran, Pakistan and India are also interested in gas imports from Turkmenistan. This means that gas production of Turkmenistan has to be considerably extended to satisfy the demand.

The gas export potential of Russia strongly depends on the development of its internal gas consumption. Russia itself consumes about two-thirds of its enormous gas production and exports only one-third. This is the consequence of a reorientation of energy consumption to gas at the expense of coal and oil as decreed in the eighties. This "gas break" had been conceived as a temporal matter, but has continued up to now because gas is cheaper than coal and oil on the internal market. A second reason for the high gas consumption is its inefficient use in outdated power plants and heating installations. In addition, gas is wasted and avoidable CO_2 is emitted because associated gas, which is a by-product of crude oil production, is flared in the amount of 60 bcm p.a.[24] Only if the administrated internal gas price rose sufficiently could the increase of gas consumption be constrained

24 International Energy Agency, *Optimizing Russian Natural Gas*, Paris 2006, p. 21.

Table 2
Calculations of a Russian Gas Deficit (billion m³)

	Milov I 2010	*Milov II 2010*	*Paillard I 2012*	*Paillard II 2012*
Gazprom production	550	527		
Independent producers	0	120		
Total production	**550**	**647**	**645**	**555**
Import	105	85		
Total supply	**655**	**732**	**645**	**555**
Export to Europe/CIS	312	325	223	228
Export to Asia/US	0	38	35	35
Total export	**312**	**363**	**258**	**263**
Domestic consumption	469	465	440	480
Total use	**781**	**828**	**698**	**743**
Balance	**−126**	**−96**	**−53**	**−188**

Sources: See notes 29 and 30.

to 500 bcm in 2010 and to 550–600 bcm in 2030. This will not mean an adjustment of the internal price to the export price, but an adoption of the "European" price formula, which ties the gas price to the prices of alternative fuels, above all to crude oil. There are some fears that higher prices on the internal gas market will lead to declining gas exports to the West.[25] But these fears seem to be unfounded because higher internal prices will reduce the volume of internal gas demand and, therefore, export will remain an attractive option for Gazprom.

The Russian gas export potential

The US Energy Information Administration (EIA) and the International Energy Agency (IEA) differ considerably in their evaluation of the Russian gas export potential. Whereas the EIA, in accordance to its optimistic production forecast, calculates a very optimistic export potential, the IEA predicts a situation close to stagnation of Russian gas exports. On the average, the prognoses forecast an increase of gas export from about 200 bcm in 2005 to 300 bcm in 2030.

Also, a certain reallocation of gas exports is anticipated. Whereas, at present, all Russian gas exported goes to the CIS and to Europe, in the future some of it will be directed to China and South East Asia. But the bulk of Russian gas exports will always flow in the western direction, due to the vast pipeline network in operation, whereas pipelines to the east still have to be built.

The story of the 2010 gas deficit

Both the increase of Russian domestic gas consumption and the growing gas export obligations force the question of the sustainability of the Russian gas balance. Some observers, like the former Russian deputy energy minister Vladimir Milov, called attention to an impending Russian gas deficit of 126 bcm in 2010.[26] His arguments have been presented to a broader audience by Alan Riley, a lecturer of competition law at the London City Law School, in a publication of the

25 Aldo Spanjer, "Russian Gas Price Reform and the EU-Russian Gas Relationship. Incentives, Consequences and European Security of Supply", in: *Energy Policy* 35, 5 (2007): pp. 2889–98, www.law.leidenuniv.nl/general/img/AS2007%5B1%5D%2E01_tcm11-11387.pdf.

26 Vladimir Milov/Leonard Coburn/Igor Danchenko, "Russia's Energy Policy, 1992–2005", in: *Eurasian Geography and Economics* 47, 3 (2006): pp. 285–313 (305); homepage of Milov's "Institute of Energy Policy", www.energypolicy.ru/eindex.php.

Brussels-based Centre for European Policy Studies.[27] Meanwhile, the thesis of an upcoming Russian gas deficit as presented by Milov and his followers is by no means convincing.

Though Milov in his statements always referred to the importance of independent gas producers and to the gas production of the oil companies in Russia, he neglected their contribution—which will add 120–140 bcm in 2010—in his frequently cited deficit calculation.[28] Even though he corrected this mistake in a later publication, he incorrectly calculated a gas deficit of 96 bcm, because he forecast an extremely low gas production simultaneously with an extremely high export obligation.[29]

But Milov is not the only author who wrongly calculated a Russian gas deficit. Also Christope-Alexandre Paillard of the French Ministry of Defence forecast a gas deficit of 63 to 200 bcm for 2012, because he excluded the Russian gas imports from Central Asia and the contribution of independent gas producers from his calculation.[30] At the same time, the IEA uttered its concerns about too little investment in Russian gas production installations, but refused to publish its own forecast of the Russian gas balance.[31]

This does not mean that a Russian gas deficit is unlikely, because the balance of Russian gas supply and demand depends heavily on the timely opening up of the giant gas deposits on the Yamal Peninsula and also on the construction of the connections to the net of export pipelines.

27 Alan Riley, "The Coming of the Russian Gas Deficit. Consequences and Solutions", in: *CEPS Policy Brief* 116 (2006), http://shop.ceps.be/BookDetail.php?item_id=1389; Alan Riley/Frank Umbach, "Out of Gas. Looming Gas Deficits Demand Readjustment of European Energy Policy", in: *Internationale Politik – Transatlantic Edition*, (Spring 2007): pp. 83–90 (85).

28 Andreas Heinrich/Julia Kusznir, *Independent Gas Producers in Russia*, Koszalin: Koszalin Institute of Comparative European Studies, 2005 (KICES Working Papers 2/2005), www.kices.org/downloads/KICES_WP_02.pdf.

29 Vladimir Milov, "Gaz Rossii. Real'nye i mnimyie problemy", in: *Neftegazovaja vertikal* 15 (2006); Vladimir Milov, *Russian Oil and Gas Industries. Current Trends and the Impact of Politics*, Moscow, June 29, 2006, www.energypolicy.ru/news.php?id=1002249.

30 Christophe-Alexandre Paillard, *Gazprom, the Fastest Way to Energy Suicide*, Paris, March 2007 (Russie.Nei.Visions 17/2007), pp. 6–7, www.ifri.org/files/Russie/ifri_Gazprom_paillard_anglais_mars2007.pdf.

31 International Energy Agency, *Natural Gas Market Review 2007. Security in a Globalising Market to 2015*, Paris 2007.

Russian Energy Strategies in the Gas Sector

Taking Advantage of an Asymmetric Dependency?

While in the seventies gas from Russia had been regarded as a safe alternative to the precarious energy imports from the Middle East, a newly inflamed discussion gives the impression that Russian power and influence endangers European energy security.[32] One of the main arguments is the alleged "asymmetric dependency" of Europe from Russia in the gas sector. The procurement of natural gas by pipelines admittedly offers nearly no possibilities to change suppliers and therefore an interruption of deliveries would have considerable consequences for consumers. But the dependency is two-sided: Neither the supplier nor the recipient can change its partners. Therefore, a discontinuation of deliveries is detrimental to both sides. The negative consequences for the Russian side would be still more serious than for Europe, because Europe's share in Russian gas exports is more than 90 per cent, while Russia's share in European gas imports is only about 60 per cent, with a decreasing trend.[33]

One point against this is that Gazprom could temporarily do without earnings from gas export, whereas its clients do not possess a similar leverage. This argument totally misjudges the commercial interests of the company. Gazprom is vitally dependent upon its reputation as a reliable supplier and it is not prepared to jeopardize it for any short-run advantages or a (unspecified) Russian external energy policy. In fact, an arbitrary stop of delivery would bring about most serious consequences for Gazprom and the whole Russian economy. Because natural gas in Europe competes heavily with coal and renewable energies, European power stations and industrial consumers in the case of a prolonged supply crisis would switch to those energy carriers. Gazprom would most probably lose its main markets forever. The consequences for the company and the Russian budget would be fatal. Therefore, the thesis of the "asymmetric dependency" turns out to be unfounded.

32 Robert L. Larsson, *Nord Stream, Sweden and Baltic Sea Security*, Stockholm 2007, www.foi.se/upload/english/reports/foir2251.pdf; Zeyno Baran, "EU Energy Security. Time to End Russian Leverage", in: *The Washington Quarterly*, (Autumn 2007): pp. 131–144.

33 See also Jérôme Guillet, *Gazprom as a Predictable Partner. Another Reading of the Russian-Ukrainian and Russian-Belarusian Energy Crises*, Paris, March 2007 (Russie.Nei.Visions 18/2007), pp. 17–18, www.ifri.org/files/Russie/ifri_Gazprom_guillet_anglais_mars2007.pdf.

Will Russia Join a Gas Cartel?

Some statements of the presidents of Iran and Russia on the possibility of a cartel of the gas producing countries similar to the Organization of Petroleum Exporting Countries (OPEC) alarmed the public and the EU institutions. The May 2007 resolution of the thus far insignificant Gas Exporting Countries Forum, which claimed to intensify co-operation between its members, further boosted those fears.

> In the system of long-range contracts, the gas export price at the border of a receiving country is derived from the prices of the substitutes for natural gas, for example hard coal and fuel oil *(replacement value)*. The price at the border of the supplier country corresponds to the export price without transport costs *(netback pricing)*. Therefore, the export price for the supplier depends on the internal situation in the respective receiving country. On the other hand, the gas price in the consumer country neither depends on production costs nor on transport expenditures of the supplying company. Because the recipient has to accept the fixed volume of gas, he bears the quantity risk *(take or pay)*, whereas the supplier bears the price risk, because he can not influence the price. (see Energy Charter Secretariat, *Putting a Price on Energy* [see n. 6]).

A gas cartel only becomes effective when its members jointly vary production in order to influence the gas price. In particular, a decrease of production aims at stabilising or increasing the gas price. Meanwhile, in Europe and most parts of the world, the gas price is not determined by supply and demand but by means of long-term contracts, where it is coupled to indices,

which reflect above all the oil price. Therefore, the gas price is not at the disposal of the gas producers, and an OPEC-like cartel mechanism could not work. A cartel would presuppose the cancellation of the existing long-term contracts. But at present, no big gas producer is considering such a step. Because the economic and political interests of the big gas producing countries of Russia, Iran and Qatar differ considerably, it is extremely questionable that a gas cartel would come about in the future.[34]

34 Dominique Finon, *Russia and the "Gas-OPEC". Real or Perceived Threat?*, Paris, November 2007 (Russie.Nei.Visions 24/2007), www.ifri.org/files/Russie/ifri_RNV_eng_Finon_opepdugaz_sept2007.pdf.

Instruments of an External Energy Policy

Diversification of Gas Imports

More than 80 per cent of European gas imports are from Russia or Algeria. Since the gas imports from other African countries and the Middle East will increase, the share of the two big suppliers will decrease correspondingly to about 60 per cent.[35] In this context, a new "Southern gas transport corridor" ("Nabucco") could play a role in the further diversification of European gas imports. Five gas companies—the Turkish Botas, the Bulgarian Bulgargaz, Romanian Transgaz, Hungarian MOL as well as Austrian OMV—are members of the operation. The European Commission has awarded the project a priority status and has incorporated it in its list of Trans-European Energy Networks. The "Nabucco" gas pipeline seems to promise not only an increase of energy supply security but also a reinforcement of emancipation endeavours of the Central Asian republics towards Russia. But whether these hopes are justified remains an open question, because it is doubtful whether there is enough gas to fill the planned 31 bcm pipeline. Firstly, the gas export volumes of the Central Asian gas producers Kazakhstan, Uzbekistan and Turkmenistan are to a large extent promised to Gazprom. Secondly, a gas pipeline across the Caspian Sea, which will connect Turkmenistan and Azerbaijan (the "Trans Caspian Pipeline"), is still missing. Thirdly, Azerbaijan's gas exports will not serve the Turkish market and Greece and Italy until 2015.[36]

The main supplier for a "Southern gas transport corridor" could be Iran, but only on certain conditions: First of all, Iran, whose gas production presently is absorbed by internal consumption, must become a relevant gas exporting country by developing its main "South Pars" gas field in the Persian Gulf. Secondly, Teheran needs to give gas exports to the West at least the same priority as their planned gas exports to Pakistan, India and China.[37] Thirdly, Gazprom must not succeed in satisfying the gas demand of great parts of southern Europe by means of alternative pipelines. But Gazprom already disclosed two pipeline projects which could be regarded as rivals to "Nabucco": At first the company announced the extension of the "Blue Stream" pipeline from Ankara in the western direction. Subsequently, Gazprom and the Italian Eni S.p.A. agreed to build a second submarine pipeline (besides the "Blue Stream") across the Black Sea to Romania and to extend it further to southern Europe or western Europe (the "South Stream"). It is still unsure if and when these rivalling projects will be realised. But their announcement has already affected the "Nabucco" project negatively.

Institutionalisation of Energy Relations

With a strong interest in its energy security, Europe is very much interested in the institutionalisation of its energy relations. Two of the corresponding proposals, the "Energy NATO" and the "Energy OSCE", are oriented towards the principles of collective security.[38] Whereas the Polish idea of an "Energy NATO" would involve only the European energy consumer states and is aiming at collective assistance in the case of a supply crisis, the "Energy OSCE", an idea of German Foreign Minister Frank-Walter Steinmeier, would include also the producer and transit states and comprises an international energy dialogue.[39]

But both concepts have their drawbacks. Whereas the "Energy NATO" finds little backing by EU countries because it is obviously directed against Russia, the "Energy OSCE" lacks support likewise, since it is duplicating largely the content of the Energy Charter Treaty (ECT). Through the ECT and its Transit Protocol, a vastly developed system of norms for energy relations

35 Hafner, *Gas Corridors* [see n. 9].

36 Vladimir Mišin, "Šag k èksportu gaza", in: *Nezavisimaja gazeta*, July 10, 2007.

37 Karin Kneissl, "Iran: Facing East and West", in: *Middle East Economic Survey* 49, 41 (2006), www.mees.com/postedarticles/oped/v49n41-5OD01.htm.

38 OSCE = Organization for Security and Co-operation in Europe.

39 Oliver Geden/Andreas Goldthau/Timo Noetzel, *"Energie-Nato" und "Energie-KSZE" – Instrumente der Versorgungssicherheit? Die Debatte um Energieversorgung und kollektive Sicherheitssysteme*, Berlin: Stiftung Wissenschaft und Politik, May 2007 (SWP Discussion Paper), www.swp-berlin.org/de/common/get_document.php?asset_id=3959.

exists. Nearly all Western and Eastern European states have signed and ratified this treaty. Russia too had signed the ECT in 1994, but the Russian Duma has refused to ratify it up to now. (Russia certainly promises to apply the ECT provisionally as far it is compatible with the Russian constitution and Russian law.) Russia's position is further supported by the fact that big energy producers like Norway and Australia did not ratify the ECT either, and the United States has not even signed it.

Some of the arguments, which had been brought forward by Russia, against the ECT have become invalid in the mean time. So it is now unchallenged that the ECT neither questions the existing long-run gas contracts nor will demand higher Russian internal gas prices. But still, Gazprom's chief lobbyist, Valeri Yazev, asserts that the ECT and its Transit Protocol enables the Central Asian gas exporters to use the Russian gas transport system and, by this means, endangers Russia's gas exports to the West. But the Energy Charter Secretariat argues that the ETC will not compel Russia to open its pipelines to competing countries. Also, the ETC will not give foreign companies unconditional access to its energy resources but only defends existing investment, says the Energy Charter Secretariat. Moreover, Russia will profit from the norms of the transit protocol because it prohibits interruption of transit flows.[40]

Russia rightly refers to the fact that, until now, the ECT has not covered the trade of nuclear fuels—in spite of the fact that the Partnership and Co-operation Agreement (PCA) had foreseen this already in 1997, and therefore, in this trade segment, Russia is banned from the European market. In addition, Russia rejects the "Regional Integration Clause" of the ETC, which excludes energy transport within the EU from the regulations of the Transit Protocol.

President Putin explicitly argued against the ratification of the ECT in its current version, and there are no signs towards a change of the Russian position during the government of his successor either. Putin only indicated that Russia would be prepared to adopt some of the principles of the ECT into the PCA, which is bound for renewal. But it is debatable whether this will imply a relevant benefit for foreign investors and trade partners. The inclusion of the dispute settlement mechanism of the ECT into the PCA would be more important instead.[41] Further, the EU should consider revising its position regarding the trade with nuclear materials and the "Regional Integration Clause" of the Transit Protocol in order to gain Russian support for the ECT.

Enlargement of the Energy Mix by Biomethan

Clearly the enlargement of the respective national energy mix by an extended use of renewable energies or an intensified use of nuclear energy will reduce the dependency upon imported fossil fuels. Natural gas can be substituted by biomethan, which can be extracted from biogas or bio-synthetic gas (Bio-SNG).

Biogas is produced by fermentation of waste products of livestock farming as well as plants like grasses, corn or wood. **Bio-SNG** is produced by gasification of residual wood and lumber. From both gases, **biomethan** is gained, which possesses the same quality as natural gas with a methane content of 93–98 per cent.

Biomethan can be fed into the gas pipeline network if it receives the required pressure. In principle, European biomethan could substitute imported natural gas in relevant quantities, provided that production costs could be reduced compared to present costs. If that happens, a contribution of about 300 bcm biomethan to the European gas supply is conceivable until 2030.[42] Furthermore, countries like Ukraine, Belarus and Russia potentially could sell biomethan to Europe, using idle pipeline capacities.

Improvement of Energy Efficiency

An improvement of energy efficiency can be accomplished by a multitude of measures which affect production, transport, transformation and consumption of energy. The required investment pays itself off by diminishing consumption and reducing environmental damages. If not only the European consumer

40 Energy Charter Secretariat, *Selected Speeches and Presentations*, www.encharter.org/index.php?id=59&L=0.

41 The articles 7.7, 19, 26, 27 and 29 of the ECT contain dispute settlement regulations, see www.encharter.org/index.php?id=32.

42 Daniela Thrän u.a., *Möglichkeiten einer europäischen Biogaseinspeisungsstrategie, Teilbericht I*, Leipzig, January 2007, pp. 27–29, www.oeko.de/service/bio/dateien/ie2007biogas_osteuropa_teilbericht_1.pdf.

states but also energy producers like Russia and transit states like Ukraine, Belarus and Moldova were to participate, broad fields for co-operation could be provided. The EU action plan for energy efficiency pursues this target.[43] In this field the EU can take advantage of the experience of national energy agencies which, for many years, dealt with the improvement of energy efficiency in Eastern Europe and the CIS.[44]

43 Commission of the European Communities, *Action Plan for Energy Efficiency*, Brussels, October 2006, p. 22 (COM (2006) 545 final), http://ec.europa.eu/energy/action_plan_energy_efficiency/index_en.htm.
44 For instance the German Energy Agency, www.dena.de/, the Austrian Energy Agency, www.energyagency.at/portrait/index.htm, and the Russian Energy Technology Centre, www.technologycentre.org/content.php?topic=3.

Supply Security and Energy Dialogues

The uncertainty of the future's European gas demand and the expansion of LNG trade both pose problems for Russian production and investment planning in the gas sector. Conversely, Europeans wonder whether Russia's gas export capacity will be sufficient to comply with supply contracts at any time. Both worries can not be rebutted easily.

European import demand will hinge significantly on future EU policies in the field of energy saving, energy efficiency and the reduction of greenhouse gases. The more Europeans make use of renewable energies (including biomethan), nuclear energy or zero-emission coal power stations, the less they will consume and the less they will have to import natural gas from Russia. Therefore, gas demand forecasts could become an interesting topic for the EU-Russia energy dialogue.

The future of the Russian gas supply capability depends primarily on the speed of development of the Yamal gas deposits. Even though Europeans can not influence this process, they can demand more transparency about Gazprom's investment plans. Likewise, this should become a topic of the EU-Russia energy dialogue; this dialogue, supplemented by EU dialogues with the transit countries, could support the EU external policy. It should concentrate on mutual information and the launch of concrete and far-reaching energy efficiency projects.

Abbreviations

CIS	Commonwealth of Independent States
ECT	Energy Charter Treaty
EIA	Energy Information Administration
IEA	International Energy Agency
LNG	Liquefied Natural Gas
OPEC	Organization of Petroleum Exporting Countries
PCA	Partnership and Co-operation Agreement