



## Belarus as a Gas Transit Country

### Summary

The current paper aims to identify the long-term economic interests of Belarus and Russia (Beltransgaz and Gazprom) in transiting Russian gas, and to see whether they are different or can be combined. European countries are the main consumer of Russian gas, 20% of which is delivered through Belarus. Future developments of the EU markets such as increased competition among gas-importing countries force Russia to diversify gas supply to Europe in order to minimize its supply cost. Hence, providing effective pipeline operations is also of crucial importance for transit countries such as Belarus in order to attract (and to benefit from) sufficient transit volumes. To consider this, we model the two main markets for natural gas, the European Union (EU15) and Central and Eastern Europe (CEE), three gas-exporting countries (Algeria, Norway and Russia) and two transit routes for Russian gas, Ukraine and Belarus. Using this model we simulate expected developments on the EU gas market and project their consequences for export and transit countries. Based on estimations it appears that both Belarus and Russia benefit from joint cooperation. This result is driven by the lower cost of gas transit through Belarus as compared to Ukraine. Thus, as long as Belarus keeps transit fees on their current competitive levels, the Russian side has an incentive to transit as much gas as possible through Belarus, which in turn is able to sustain its current profits. Furthermore, extending Belarus' transit capacity again benefits both countries: Belarus because of higher profits as transit volumes increase, and Russia because it can transport more gas at low Belarusian costs to EU markets (and thus, less gas at higher costs through Ukraine). Therefore, joint cooperation in gas transit satisfies the interests of both countries, and additional investments in transit capacity are in the interest of both countries. Therefore, Belarus should seek to create conditions conducive for such investments by demonstrating its reliability as gas transit country. Finally, intensified cooperation with Russia that suits both countries' interests would also reduce the risk for Belarus to suffer from interrupted energy supplies as it happened recently.

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## 1. Introduction

The recent occasion of interrupted gas supply has strongly stimulated concerns in Belarus about the dangers of its heavy dependency on Russian gas. Given the crucial importance of gas in Belarus' energy mix as well as Russia's geographical position as practically the only possible provider of gas deliveries or transit services, this dependency seems to be unavoidable leaving Belarus as a 'victim' without any choice.

In reality, however, the situation is not that simple. Instead of concentrating on current, short-term problems of whether or not to maintain privileged price setting for gas deliveries to Belarus (that from an economic point of view are inefficient and not sustainable anyway) we focus on the much more profitable issue of transit of Russian gas through Belarus and on the corresponding long-term interests of both countries involved. Here we demonstrate that also Russia faces strong external pressures on its main market for gas exports, i.e. for cutting supply costs, and that Belarus provides transit of Russian gas at the lowest costs. Thus, as we demonstrate in this paper, long-term interests of Belarus and Russia both go in the same direction and it is therefore in the very interest of both countries to solve the present problems by offering reliable but also fair terms of future cooperation.

The paper is organized as follows: Section 2 gives a brief overview on recent developments on the European market for natural gas and the implications for Russian gas exports, Section 3 sketches the prospects of Russia's gas industry, Section 4 discusses the corresponding perspectives for Belarus as a transit country and Section 5 summarizes and concludes

## 2. European Natural Gas Market

The European Union (EU) is one of the largest consumers of natural gas in the world, accounting for about 15% in global consumption. According to projections of major international energy organizations such as the International Energy Agency (IEA), the Energy Information Administration (EIA) or the EU forecast (Green Book), the already large demand levels of around 500 bcm per year are expected to further increase to 800 till 1000 bcm within the next 20-30 years (Table 1). The main drivers for this strong development are continued substitution of nuclear and fossil fuels (oil and coal) as well as increased incentives for energy-conserving measures (e.g. imposed through ratification of the Kyoto Protocol). As a result, the share of gas in Western Europe's energy mix has increased from 5% in 1970 to around 20%, and is expected to grow further.

Since only the United Kingdom and the Netherlands have natural gas resources large enough to satisfy domestic demand, the EU relies heavily on gas imports.<sup>1</sup> With projected growth in demand levels as given in Table 1, import dependency is expected to increase from 40% today to 67% in 2020. Among the exporters to the EU, the countries of the former Soviet Union account for the largest share (44%), followed by Algeria (29%) and Norway (26%).

**Table 1. European natural gas demand – EU, IEA and EIA<sup>2</sup> forecast<sup>3</sup> (bcm)**

Expert Organization	Reference case			High growth case		Low growth case
	EU*	IEA**	EIA***	IEA**	EIA***	EIA***
2000	504	503	524			
2005			597		611	575
2010	646	642	705	644	739	652
2015			824		889	758
2020		800	965	831	1070	872
2030	880	943				

\* Current EU plus all accession countries

\*\* OECD Europe – 22 countries

\*\*\* Eastern and Western Europe – 30 countries.

Source: Green Book, IEA, The Royal Institute of International Affairs (RIIA), *Briefing Paper No. 26*, November 2001 and own calculation.

Differences in the projections given in Table 1 are mainly due to:

<sup>1</sup> Green Paper: Towards a European Strategy for the Security of Energy Supply. European Communities 2001.

<sup>2</sup> For the detailed forecast on natural gas consumption with all scenarios published in *Annual Energy Outlook 2002* see table A1 in the Annex.

<sup>3</sup> Quantitative assessments of different expert organizations differ substantially. The main reasons for these discrepancies are different assumptions on GDP growth and price for natural gas increase during the next 20-30 years.

- Differences in general assumptions, e.g. growth rates.
- Increasing energy prices and thus, substantially lower energy demand (the Green Paper forecasts 81% increase in a price for natural gas by 2030).<sup>4</sup>
- Substantial increase in competitiveness of renewable energy due to both, price increases of traditional fossil fuels and technological progress during the next thirty years.
- Substantial structural changes and competition enforcement in energy sector.

In particular, the quantitative importance of the last aspect is of crucial importance. During the past 30 years the structure of European gas markets has transformed towards a more mature level, and competitive pressure increasingly gains importance. In 1998, the EU started liberalizing its markets for gas and electricity<sup>5</sup> in order to reduce prices through increased competition. Therefore, several directives imposed opening of each national market by up to 28% in 2005 and 33% in 2010. In 2003, the EU tried to further accelerate this development by aligning liberalization of electricity and gas markets for non-household users by July 2004, and a complete liberalization for all users by July 2007. In particular, liberalization has to impose the following principles:

- The freedom to choose a supplier will be extended to all non-household consumers as of 2004 for both electricity and gas.
- Unbundling of transmission and distribution functions from production and supply.
- Non-discriminatory access to networks available to all eligible consumers and producers on the basis of published tariffs.
- Every member state will establish a regulatory body to ensure effective control over tariff setting.

Despite this clear direction of EU policy in general, not all EU members follow a policy oriented solely towards full liberalization. In particular, while the United Kingdom (UK) strongly pushes towards increased competition with strong and independent regulators<sup>6</sup> especially Germany and France have so far opposed a fast opening of the market.

In principle, the impact of increased competition between gas traders on the EU market for gas-exporting countries (in particular Norway, Algeria and Russia) is clear: while so far gas deliveries have been secured by long-term contracts (so-called 'take or pay' contracts), increased competition in gas-to-gas business will increase the importance of spot market transactions. This in turn will also increase the degree of competition between different gas-exporting countries with the costs of supplying their gas to Europe being the major determinant for export quantities. As Table 2 shows, Russia's costs of supplying gas to the EU are much higher than those of the two main competitors, Algeria and Norway. Thus, reducing supply cost will be crucially important for Russia in order to maintain competitiveness of its gas exports.

**Table 2. Costs of gas supply to EU 15 for incremental supply volumes (USD per tcm)**

Exporting country	Russia (NadymPurTaz) through		Algeria	Norway
	Ukraine (Soyuz)	Belarus (Yamal I)		
<b>Long Run Marginal Costs:</b>				
- Extraction	14.3	14.3	16.1	44.6
- Transport	75.4	61.4	28.5	30.4
- Transit fees	10.0	5.7	3.9	
<b>Total</b>	<b>99.6</b>	<b>81.4</b>	<b>48.0</b>	<b>75.0</b>

\* For extraction and transportation we assume a share of 15% in Long Run Marginal Costs.

Source: Assessment of Internal and External Gas Supply Options for the EU. Observatoire Mediterraneen de L'energie.

<sup>4</sup> For example, projected demand in the IEA forecast depends on prices, which in turn are exogenous and expected to increase only modestly. In particular, they are assumed to remain flat at around USD 2.80/MBtu (in 2000 Dollars) and to rise only after 2010 in line with higher oil prices (IEA: World Energy Outlook 2002, pp.50-51).

<sup>5</sup> Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998.

<sup>6</sup> The UK already started liberalizing its gas market in the late 1980s and currently has the by far most competitive market within the EU (IEA: World Energy Outlook 2002).

### 3. The Russian Gas Industry

#### 3.1 Gas production

With a share of almost 40% Russia holds the largest natural gas reserves in the world. Nevertheless, gas extraction dropped from 640 bcm in 1990 down to almost 500 bcm due to the under-investment in the upstream sector and a slump in domestic and CIS demand. Only during the last two years, annual production has stabilized on a level of around 530 bcm. However, substantial investments will be necessary to sustain this production volume in the future. The total amount of necessary investment for the next 20 years is estimated at about USD 164-171 bn (USD 71-73 bn in extraction, USD 76-80 bn in transportation and USD 17-19 bn in storage).<sup>7</sup> Most likely, a substantial part of this funds will have to be attracted from outside Russia, mainly from the major consumer of Russian gas and oil, the EU.

#### 3.2 Transit of Russian gas to EU

In 2002, Russia supplied gas to 20 distant foreign countries. The volume of gas exports to European countries, Russia's largest trade partner, was 128.6 bcm, an increase of 1.7 bcm as compared to the previous year. Currently, gas imports from Russia account for about 20% of total EU gas consumption. In the light of the expected developments on the EU markets, this amount is expected to increase to about 200 bcm in 2010.<sup>8</sup>

Before 1999 about 95% of natural gas export outside CIS and Baltic states was transited through Ukrainian territory. But, due to repeated conflicts with the Ukrainian side during the 1990 Gazprom has initiated a number of projects bypassing Ukraine and diversifying gas transmission routes:

- The Black Sea Russia-Turkey natural gas pipeline ("Blue Stream") commenced operation in 2003. The project covers Europe's South-East natural gas market segment, serving as a basis for continuing Russian gas exports expansion in this market. Construction of the first stage of it was finished at the end of 2002. In 2003 the amount of gas export by this pipeline is planned at 2 bcm and after final completion of the project in 2008 the capacity of the pipeline is intended to reach 16 bcm per year.
- According to an agreement between Belarus and Russia the construction of the Central European market oriented transcontinental trunk pipeline Yamal – Europe (Yamal I) began in 1994 and should attain its design capacity of 33 bcm per year in 2005. The length of the Belarusian part is 575 km. The construction of a second Yamal – Europe trunk line with projected capacity 34 bcm per year (Yamal II) has been developed but not yet been started.
- The North-European gas pipeline (NEG) is a large-scale strategic project. The NEG would open a completely new route for Russian gas exports to Europe that completely avoids transit states. Project implementation will allow connecting directly gas network of Russia with the countries of the Baltic region and with the European gas transmission networks. The gas pipeline will run under the waters of the Baltic Sea from Vyborg to the coast of Germany (in the vicinity to the town of Greiswald). However, construction of this pipeline requires investments of about USD 5 bn, which Gazprom cannot finance by itself since it badly needs to invest in its own production fields in Siberia. Alternatively, joint cooperation with Western partners might be possible but no substantial progress has yet been made.

To summarize, given the increasing pressure of competition from other gas exporters on its biggest export market, the EU, as well as the necessity to invest large funds in securing gas production at its own large gas fields, Russia can neither afford financing too expensive pipeline projects, nor paying high transit fees for use of existing pipelines. Naturally, the Russian side is currently trying to organizing transit conditions for existing pipelines as favorable as possible, and use the existing capacities by as much as possible.

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<sup>7</sup> Source: Ukrainian Center for Economic and Political Research (UCEPR) named after Razumkov, *National Security and Defence*, #3 2002

<sup>8</sup> However, the IEA forecast might substantially overestimate the natural gas export from Russia since it does not consider potential decoupling of prices for natural gas and oil and simultaneous Gazprom competition with countries with much lower costs at the EU border like Algerian Sonatrach (IEA forecasts an increase by 50% in 2020 in a reference scenario while the Green Paper of the EU expects prices to increase by 80% in 2030).

#### 4. Implications for Belarus as a Transit Country

At present, the most useful transport capacities for Russian gas to the core markets in the EU (Germany, France, Italy) are Belarus' Yamal I (30 bcm) and Ukraine's Gas transit system (110 bcm), while supplying via the Blue Stream pipeline and Turkey (16 bcm) is rather expensive, and realization of the NEG (30 bcm) is not very realistic. Instead, it appears that the most reliable options are expanding the capacity of Ukraine's and Belarus' systems to 170 bcm and 56 bcm, respectively. Given estimated gas exports to Europe of around 200 bcm per year, this would be sufficient to secure gas transit at the lowest costs.

As Table 2 indicates, Belarus has a competitive advantage vis-à-vis Ukraine since the costs of gas supply through Belarus are much lower. To utilize this advantage, Belarus should demonstrate its credibility as reliable transit partner via sustaining and improving the technical state of its pipeline system as well as creating attractive conditions for realizations of the new pipeline construction project (Yamal II).

Against this background, the interest of Gazprom/Russia in the Belarusian transit system is obvious and the creation of a stock company jointly with Gazprom by July, 1 2003 was provided for in compliance with inter-government treaty. Nevertheless the agreement about establishment of a joint cooperation has not been signed so far as there still exist several conflicts between the countries' interests. At present, the main concern of Belarus is the strong dependency of gas deliveries from Russia. However, given the crucial importance of gas in Belarus' energy mix, as well as the fact that Russia is basically the only possible provider of gas deliveries (or transit services of gas deliveries from other countries to Belarus) such a high level of dependency seems to be almost impossible to avoid. Consequently, we suggest focusing the discussion more on the broader picture in which Russian gas exports and Belarusian transit activities operate. This is meant to identifying the long-term economic interests of both, Russia and Belarus (Gazprom and Beltransgaz), and to see whether they are different or can be combined. If the later is the case, it should be possible to solve the current problems.

We model two main markets for natural gas, the European Union (EU15) and Central and Eastern Europe (CEE), and three gas-exporting countries, Algeria, Norway and Russia. While Algeria and Norway solely export to EU15, Russia also supplies gas to CEE. Because there are only three gas-exporting countries with similar bargaining positions, each of them can—to some degree—control the import price for natural gas in Europe<sup>9</sup>. While Algeria and Norway supply directly to the market, Russian gas has to travel through either Ukraine or Belarus.

Using this model we simulate expected developments on the EU gas market as discussed in section two and project their consequences for export and transit countries. Our estimations are based on exports of the three countries in 2001 (Benchmark) as well as on estimated Long Run Marginal Costs of gas supply to European markets as given in a study prepared for the European Commission, DG Energy & Transport (Table 2). This cost estimations demonstrate the key structural problem of Russian gas on European markets: its high supply costs in particular due to the extremely long transport lines. Having this in mind, Russia's current position as largest exporter appears to contradict economic intuition. In fact, it can only be explained by political motivations and by low levels of competition that have prevailed on the EU gas market thus far.

We model the following three scenarios:

**Scenario 1:** *Increased competition* between the three gas-exporting countries to simulate the gradual replacement of long-term contracts by spot market transactions.

**Scenario 2:** *Increased competition plus demand expansion* on the EU market as described in section two above.

**Scenario 3:** *Increased competition plus demand expansion plus larger transit capacity* due to expansion of the Yamal-Europe pipeline from 28 bcm to 56 bcm (Yamal II). In addition, we assume that Russia and Ukraine succeed in establishing a joint transit consortium that reduces supply costs through Ukraine.

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<sup>9</sup> In technical economic terms, the model assumes profit-maximizing behavior throughout and compares the outcome of a combined Cournot-Nash-Stackelberg equilibrium with a Cournot-Nash equilibrium.

The results of our estimations are given in Table 3. They show what happens to Russia's gas exports under the three scenarios, as well as the corresponding consequences for the transit countries. As can be expected, increased competition (Scenario 1) reduces Russia's exports while Norway and Algeria gain large market shares. In contrast, when demand in the EU increases (Scenario 2 and 3) also Russian exports rise. However, since supply costs are still relatively large, Russia's market share remains below Algeria's and Norway's.

What are the consequences for Belarus? Since supply costs through Belarus are considerably below those through Ukraine in all three scenarios, it is profitable for Russia to first transport its gas through Belarus until all capacity is filled up, and only then optimise their profits by determining the transit quantity through Ukraine. Thus, since transit fees do not change in our scenarios, profits to Belarus only depend on the availability of capacity that ensures the low supply costs. This is demonstrated in Table 3. Compared to the *Benchmark*, profits of Belarus increase to USD 64 m in *Scenario 1* and *Scenario 2*. This however is not due to changes in the degree of competition or demand levels in Western Europe, but only because we assume that the final capacity of the Yamal I pipeline (28 bcm) will be realized as planned in 2005. But, profits to Belarus can further increase once the second Yamal – Europe trunk line is built. In this case, the increase of total annual transit capacity to 56 bcm will also lead to higher profits, namely a proportional increase from USD 64 m to USD 128 m. Finally, our results show two additional aspects: First, also Russia benefits from increased capacities in Belarus since it can transport a larger part of its exports for lower supply costs thereby making additional profits. Thus, increasing the transit capacity of Belarus is a win-win situation for Belarus and Russia (at the expense of Ukraine). To finance such investments, Belarus must seek to attract the necessary funds from abroad, either from Gazprom or the European gas industry. In both cases, a reliable operation of the present pipeline system will be crucial for convincing investors in the reliability of the new pipeline extension. Second, despite having this important cost advantage the scope for Belarus to further raise transit fees is rather limited since also Ukraine has a large potential to reduce supply costs if it succeeds to optimise its relations with Russia (this is demonstrated by the supply costs under Scenario 2 and 3 in (Table 3).

**Table 3. Model Results (simulated developments after about 10 years)**

	<b>Benchmark</b> (2001 data)	<b>Scenario 1</b> Increased Competition	<b>Scenario 2</b> Increased Competition plus demand expansion	<b>Scenario 3</b> Increased Competition, demand expansion and larger transit capacities
<b>Import price of natural gas (USD/tcm) in</b>				
EU15	81.7	67.0	109.7	109.7
CEE	54.5	52.7	48.2	48.2
<b>Transit quantity (bcm) through</b>				
Belarus	20.0	28.0	28.0	56.0
Ukraine	106.9	78.5	154.0	126.0
<b>Exports (bcm) from...</b>				
Russia to CEE	51.6	55.3	64.7	64.7
Russia to EU15	75.2	51.2	117.3	117.3
Norway to EU15	50.3	70.6	124.8	124.8
Algeria to EU15	49.3	71.7	125.8	125.8
<b>Profits (revenue minus variable costs in m of USD) of...</b>				
Russia (total)*	6113.7	4165.3	11735.5	11943.5
Belarus	45.7	64.0	64.0	128.0
Ukraine	702.2	379.3	1130.2	924.7
Norway				
Algeria	3542.2	3935.1	12285.6	12285.6
	3516.0	4051.3	12490.3	12490.3
<b>Supply costs (USD/tcm) to EU15</b>				
through Belarus	17.1	17.1	17.1	17.1
through Ukraine	23.4	21.7	17.2**	17.2**

\* Total profits of Russia from gas sales transported through Ukraine and Belarus

\*\* Russia and Ukraine operate within a joint consortium

Source: own calculations.

In addition to our quantitative argument, there are several rather intuitive advantages of intensifying joint cooperation:

- Joint cooperation precludes conflicts between the two sides. Given the strong dependency of Belarus' energy security from Russia this is a rather important argument.
- The estimated investment needs of the Belarusian gas-transit system for the next 10-15 years are about USD 1.4 bn (Beltransgaz's assessment) Beltransgaz is expecting to attract the substantial share of them outside Belarus; the more likely source is Russia.

To summarize, all our results suggest that joint cooperation of Belarus and Russia is in the long-term interest of both countries, and that without joint cooperation in gas transit it will be impossible for Belarus to realize substantial future income by establishing itself as one of the main gas bridges for Russian gas to Europe. This in particular requires Belarus to show its reliability as a transit country in order to attract investors for extending its existing pipeline capacity.

## 5. Conclusions

European countries are the main consumer of Russian gas, 20% of which is delivered through Belarus. Thus, future developments of the EU markets such as increased competition among gas-importing countries force Russia to diversify gas supply to Europe in order to minimize its supply cost. Hence, providing effective pipeline operations is also of crucial importance for transit countries such as Belarus in order to attract (and to benefit from) sufficient transit volumes.

Against this background we intend to determine the medium and long-term interest of both, Belarus and Russia in order to see whether they allow for joining efforts. Based on our modelling exercise we find the following:

- It is profitable for Russia to transport as much gas as possible through Belarus until all capacity is filled up since supply costs through Belarus are considerably lower than those through Ukraine.
- If Belarus leaves its transit fees at the current level, its profits only depend on the availability of transit capacity. In contrast, important changes on the EU market such as increasing competition or expanding demand do not affect the transit profits for Belarus.
- Russia benefits from increased capacities in Belarus since it can transport a larger part of its exports at lower costs thereby making additional profits. Thus, increasing the transit capacity of Belarus is a win-win situation for Belarus and Russia.
- Despite having this important cost advantage the scope for Belarus to further raise transit fees is rather limited since also Ukraine has a large potential to reduce supply costs in co-operation with Russia.

Thus, it appears that a joint cooperation with Russia (Gazprom) is also in the own interest of Belarus. The basic logic underlining this statement is that if Belarus does not change its transit fee in excess of its real costs, the Russian side will find it favourable to transit higher volumes through Belarus. In turn, this allows for higher aggregate profits for Russia and Belarus together, and in the case the fair and transparent sharing agreement is set up guarantee higher profits for Belarus. However, to finance such investments, Belarus needs to attract the necessary funds from abroad, either from Gazprom or the European gas industry. In both cases, a reliable operation of the pipeline system will be crucial for convincing investors in the reliability of the new pipeline extension.

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