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# Export Restraints on Russian Natural Gas and Raw Timber: What are the Economic Impacts?

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# **The Crucial Role for Competition in the Russian Gas Market: Implications for Russia and Europe**

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## **Abstract**

The paper explains that the Russian gas giant, Gazprom, has failed to invest adequately, resulting in very little development of new gas supplies in Russia. The result has been progressively increasing use by Gazprom of central Asian gas supplies, at progressively higher prices for Russia. The increased prices of gas for Russian consumers have shown that it is crucial for Russian welfare to allow new entrants, and to introduce competition in the Russian domestic market. Competition among multiple gas suppliers from Russia, however, would erode or eliminate the monopoly profits of the Russian Federation on gas exports. Thus, with a more competitive domestic market, the Russian government would be expected to grant exclusive exporting rights to a single entity (as it presently does with Gazprom) or impose export taxes. Thus, Europe should not expect to achieve cheaper Russian gas as a result of structural reforms within the Russian gas market. More promising avenues for European energy diversification are new pipeline construction to open up new sources of supply independent of Russia (especially the Nabucco pipeline) and liquefied natural gas purchases.

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## I. Introduction

During the negotiations between the European Union (EU) and the Russian Federation on Russia's bilateral market access agreement with the EU for accession to the World Trade Organization (WTO), the EU pressed Russia to charge the same price for the exports of its natural gas as it charges in its domestic industrial consumers. The Russian Federation grants an export monopoly to Gazprom, allowing Gazprom to charge profit maximizing prices on its exports. The domestic price of natural gas, however, is regulated by the Russian Federation, resulting in dual pricing of natural gas, where export prices have far exceeded domestic prices in Russia. This issue was bitterly controversial in Russia, and then President Vladimir Putin declared that Russia would not join the WTO if forced to unify its gas prices. In a paper that reportedly was highly influential in resolving this dispute, Peter Thomson and I (Tarr and Thomson, 2004), concluded that it was in Russia's interest to exploit its monopoly power on gas sales in Europe—this implies that dual pricing of natural gas was in Russia's interest. We estimated Russia gained substantially from dual pricing—by about two percent per year of its GDP.

As part of its strategy to diversify its energy sources, the European Union has sought competition in the Russian natural gas market. This has also been a long standing recommendation of the World Bank.<sup>1</sup> Due to the very low level of investment by Gazprom and resulting lack of development of new gas supplies, the introduction of competition in the Russian market has become even more crucial during the past decade. Due to lack of supplies, Gazprom is relying increasingly on purchases of central Asian gas supplies, at ever increasing prices. Ironically, after winning its bitter battle for the right to impose dual pricing of natural gas, the Russian Federation has announced plans to raise prices to its domestic industrial users to European levels in 2011, less transportation costs and export taxes.

Competition among multiple gas suppliers from Russia would erode or eliminate the monopoly profits of the Russian Federation on gas exports. Thus, if competition were introduced, the Russian government would be expected to grant exclusive exporting

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<sup>1</sup> See, e.g., Tarr and Thomson (2004) and the European Commission (2006).

rights to a single entity (as it presently does with Gazprom) or impose export taxes. This, Europe should not expect to achieve cheaper Russian gas through competition within Russia. A more promising avenue for European energy diversification is new pipeline construction to open up new sources of supply independent of Russia (especially the Nabucco and Trans-Caspian pipelines) and liquefied natural gas purchases.<sup>2</sup>

## II. Optimal Export Prices

Russia's proved natural gas reserves at the end of 2008 were 43.3 trillion cubic meters, which constitute 23.4 percent of the world's proven reserves.<sup>3</sup> Its 2008 production of 602 billion cubic meters (BCM) constituted 19.6 percent of world production. Its reserves to production ratio in 2008 of 72 years, is higher than any other significant producer except Saudi Arabia. Russia is also by far the world's largest exporter of natural gas. In 2008, Gazprom exported about 154 BCM to Europe (including Turkey). Russia, in 2008, had a market share of approximately 28 percent of natural gas sales in Europe. In the year 2008, Europe including Turkey consumed about 547 billion cubic meters (BCM) of natural gas, while importing 154 BCM from Russia.

It is in Russia's interest to try to maximize its profits from exports of natural gas. Given the need to ship natural gas from Russia to Europe through a pipeline, Russia is able to "segment" the European market from the Russian market, and competes in Europe only with pipeline supplied gas subject to an upper limit on its price equal to the price of delivered liquefied natural gas. The Russian government has given Gazprom exclusive right to use the pipelines for the export of natural gas to Europe.<sup>4</sup> Given its market share, this implies Gazprom has some market power in Europe.<sup>5</sup>

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<sup>2</sup> See Aslund (2008) for a similar view. Aslund also suggests liquefied natural gas projects for the European Union.

<sup>3</sup> See British Petroleum, *Statistical Review of World Petroleum*, various years. Russia's proved reserves are down from 47.6 trillion cubic meters and more than 30% of the world's proved reserves in 2001; production is up from 2001 production of 542 billion cubic meters.

<sup>4</sup> Gazprom paid 685 billion rubles to the Russian government in taxes in 2008. At an average exchange rate of 25 rubles to the dollar for 2008, this was \$27 billion. See <http://eng.gazpromquestions.ru/?id=12#c337>. Nemtsov and Milov (2008) argue, however, that due to gross inefficiency of Gazprom, Russia would be much better served with a state monopoly on exports, but competitive purchases by the state monopoly among competitive producers in Russia.

<sup>5</sup> The largest importers of Russian natural gas are Germany (36 BCM), Italy, (25 BCM) and Turkey (24 BCM). The next largest importers are Poland, Hungary, France and the Czech Republic, all of whom

Russian domestic consumption in 2008 of 420 BCM was 2.7 times Russia's sales in Europe. The key point is that to sell significantly more of its gas in Europe, Gazprom would have to accept a lower price, i.e., it faces a downward sloping demand curve. This means that there is no "world price" of gas that Russia faces. In this situation, it is optimal for Gazprom to set marginal revenue equal to marginal costs on exports to exploit this market power, which implies its price will exceed its long run marginal costs.

Tarr and Thomson (2003) estimated that uniform pricing of Russian natural gas would be extremely costly to Russia.<sup>6</sup> If Gazprom were to sell its gas in Europe at long run marginal costs (including transportation costs), its lost profits would equal about two percent of Russian GDP.

### **III. Russia's Domestic Gas Market**

Gazprom had a virtual monopoly on domestic gas sales for many years after independence, but the price of gas sales in Russia is regulated by the Federal Tariff Service of the Russian Federation. Moreover, Gazprom controls the gas pipeline within Russia. Legally, "Third Party Access" to the pipelines is granted in Russian law to Russia's independent gas producers (who are both vertically integrated oil companies and

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imported about 7-9 BCM in 2008. The other principal suppliers of gas to the European market are Algeria (through a pipeline across the Mediterranean), Norway, the Netherlands and the UK. See British Petroleum (2009)

<sup>6</sup> Although the data have changed since 2001, the principles remain the same. In 2001, Gazprom sold its gas in Europe at between \$79 and \$99 per thousand cubic meters plus \$27 transportation costs. Gazprom president Alexei Miller reported on March 14, 2008 that "the price [of Russian gas] in Europe now exceeds \$370. We believe the average price in 2008 could be \$378 and could even reach \$400 per 1,000 cubic meters." Regarding demand in Russia, he noted that the rise of national industries, such as producers of cement, building materials, and fertilizers and gas refineries, is also pushing up Russian gas demands. Miller said that Gazprom plans to introduce market gas prices for Russian industrial consumers in 2011. See Johnson's Russia List, <http://www.cdi.org/russia/johnson/2008-56-39.cfm>.

In 2009, however, the price collapsed to an estimated \$280 for 2009. Moreover, Gazprom in its zeal to control natural gas sales to Europe, entered into long term contracts with central Asian suppliers Uzbekistan and Turkmenistan. Gazprom reportedly is paying \$340 per thousand cubic meters to Uzbekistan in 2009. But in 2009, due to a decline in world demand, Gazprom has been forced to close down its own wells that produce gas at much lower costs than it pays to central Asian suppliers. Gazprom has acknowledged losses on central Asian purchases in 2009, but argues they will be profitable contracts in the long term. See "Falling Gas Prices Deny Russia a Lever of Power," *New York Times*, May 15, 2009. [www.nytimes.com/2009/05/16/world/europe/16gazprom.html](http://www.nytimes.com/2009/05/16/world/europe/16gazprom.html).

specialized gas companies). In fact, independent gas producers frequently complain about their access.<sup>7</sup> Nonetheless, the share of the Russian market captured by independent gas producers in Russia has grown steadily since 2002, and reached an estimated 12-15 percent of the Russian market in 2008.<sup>8</sup> Moreover, independent gas producers control about 30 percent of the natural gas reserves.

Gazprom, however, while not a monopoly in Russia's domestic market, is clearly a very dominant firm with considerable monopoly power. Until more effective competition is introduced into the Russian market, efficient regulation requires constraining the exercise of that monopoly power by allowing price to be equal to long run marginal costs. While domestic natural gas prices in Russia were only \$15-\$20 per thousand cubic meters, by 2007 they had had increased to between \$64 and \$72.<sup>9</sup> I estimate (see Tarr, 2010) that with the substantial increase in the price of natural gas to producers in Russia, prices were equal to or above long run marginal costs in 2007. Moreover, with its decree #333 in May 2007, the Government of Russia announced plans to increase the price of natural gas to industrial users to international levels by 2011, less transportation costs and export taxes. In early 2008, prices on exports to Europe were about \$378 per TCM. With transportation costs of about \$35 per TCM and export taxes at 30 percent, to implement this plan today, prices in Russia would have to rise to about \$225 per TCM. Thus, Russian domestic market prices would have to rise increase more than three times from their levels in 2007. These high prices would induce very significant inefficient reductions in Russian demand, since the value to Russian consumers would be considerably greater than the long run marginal costs of production. Russia fought a bitter battle at the WTO and won the right to have dual pricing of natural gas. However, except for the 30 percent export tax difference and the transportation fees, Russian announced plans call for it to unify natural gas prices for its industrial users.

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<sup>7</sup> See Baranov (2008) and "Deputy Prime Minister Instructs Gazprom to Ease Pipeline Access for Russian Gas Producers," *Global Insight*, July 7, 2008. [www.globalinsight.com/SDA/SDADetail13190.htm](http://www.globalinsight.com/SDA/SDADetail13190.htm).

<sup>8</sup> The largest independent seller of natural gas in Russia is the specialized gas company Novatek, followed by Rosneft. Other important independent sellers are Lukoil, Surgutneftegaz, TNK-BP and the Itera Group. See "Gazprom is Not the Only Player in the Russian Fields," *Oil and Gas—Eurasia*. August 2008. <http://www.oilandgaseurasia.com/articles/p/80/articles/684>

<sup>9</sup> Estimates based on Rosstat and Ministry of Economy data. According to Gazprom, in 2008, the average price excluding VAT and excise taxes was 1653 rubles per MCM, or about \$66 per MCM at 25 rubles to the dollar. See [http://old.gazprom.ru/documents/Background\\_09.06.09.pdf](http://old.gazprom.ru/documents/Background_09.06.09.pdf)

#### **IV. Restructuring of the Natural Gas Industry in Russia**

Why is Russia planning to allow domestic prices of natural gas to rise to such high apparently inefficient levels? Two insiders, Nemtsov and Milov (2008), have argued that Gazprom is an inefficient company and that Russian consumers and taxpayers are being forced to pay for that inefficiency. As Russia's existing gas fields are being exhausted, a significant portion of the newer discoveries are available in more difficult places that require greater investment costs. The World Bank (2010) estimates that Gazprom would have to invest \$15 billion per year to maintain production levels and \$20 billion per year to meet projected demand increases. But between 2001 and 2008, Gazprom has invested a total of only \$36 billion in gas exploration and development. Nemtsov and Milov explain that Gazprom has failed to develop the key gas fields. For example, the gas deposits of the Yamal peninsula region, with an estimated \$200 billion in required investment costs, remain undeveloped. Gazprom's production has remained stagnant since 2003, and it has made up the gap between its supplies and demand by ever increasing purchases from central Asia. But these purchases are coming at increased costs. In 2008, the presidents of the gas companies of Kazakhstan, Turkmenistan and Uzbekistan announced that Gazprom would have to pay prices tied to European levels beginning in 2009.

The Russian domestic market would be best served if Russia were to fully introduce competition. Competition in Russian gas would be best accomplished by breaking up the production and distribution segments of Gazprom into separate independent companies and effectively enforce third party access to the pipelines. The pipelines could be operated as regulated monopolies. Licenses that Gazprom has failed to use to develop gas fields under the terms of the licenses could be provided to independent companies. This would result in significant additional production, and competition among the producers will hold down the costs of natural gas in Russia.

If the additional Russian producers were allowed to export natural gas, competition among Russian firms would erode Russian monopoly profits on European sales. That is, unconstrained access to export markets would result in unified pricing through structural reform of the Russian market. In the absence of the Gazprom

monopoly, however, in order to extract the available monopoly profits on its exports of gas to Europe, it would be in Russia's interest to impose export taxes on Russian gas exporters or to use a state trading monopoly as a marketing arm of Russian natural gas exports. Compared with the Gazprom monopoly, such a system would result in higher profits for Russia as a whole, since gas would then come from the most efficient Russian supplier.

## V. Energy Diversification for Europe

### Diversification of Russian Supplies

If additional Russian producers were allowed to compete and export natural gas, in order to extract the available monopoly profits on its exports of gas to Europe,<sup>10</sup> it would be in Russia's interest to impose export taxes on Russian gas exporters or to use a state trading monopoly as a marketing arm of Russian natural gas exports. A more promising avenue for European energy diversification is new pipeline construction to open up new sources of supply independent of Russia, and liquefied natural gas purchases.<sup>11</sup>

Several new pipelines are proposed or under construction between Russia, central Asia and Europe. The most important are: Nord Stream, South Stream, Nabucco and the Trans-Caspian pipelines. Since the former two traverse Russia, they do not offer energy diversification for Europe; Russia already supplies central Asian gas to Europe through its pipelines based on contracts with central Asian suppliers. The latter two offer real diversification of natural gas supplies.

**Nord Stream.** Russia and Germany agreed to construct the "Nord Stream" project through the Baltic Sea to Germany at an estimated cost of construction of \$15 billion. EU officials forecast a beginning to the construction in 2010.<sup>12</sup> The alternate project is a

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<sup>10</sup> Some press reports have indicated that Russia agreed to limit its export taxes as part of its bilateral agreement on WTO accession with the EU.

<sup>11</sup> For example, Qatargas and Polish gas monopoly PGNiG signed an agreement in which PGNiG will import the equivalent of 1.5 BCM annually of liquefied natural gas from 2014 to 2034. Poland's consumption in 2008 was 13.9 BCM. PGNiG will construct a regasification terminal in time for the deliveries.

<sup>12</sup> See "Nord Stream Gas Pipeline on right track," Euractiv.com, March 11, 2009. <http://www.euractiv.com/en/energy/official-nord-stream-gas-pipeline-right-track/article-180127>. Smith (2008) estimates that the costs would have been only \$2.8 billion for an alternate pipeline—an enlargement of the Yamal pipeline that runs through Poland.



second pipeline adjacent to the existing Yamal-Europe route at a cost of about \$2.5 billion. The considerably higher transportation tariffs of the Nord Stream project will allow the gas to by-pass Belarus and Poland, which is seen as an advantage from Russia's perspective. But it must traverse either the Finnish or Estonian seabed and then the Swedish seabed before reaching Germany, so other intermediary countries remain involved in the transportation route.

**South Stream.** On May 15, 2009, the gas companies of Russia, Italy, Bulgaria, Serbia and Greece signed an agreement on construction of the South Stream pipeline with a capacity of about 30 BCM per year. The pipeline would travel from Russia through the Black Sea and through Bulgaria. Although the exact route is not finally determined, the Southwestern portion should travel through Greece and the Ionian Sea to Italy, while the Northwestern portion would travel through Serbia and Hungary to Austria. The estimated cost of construction of the pipeline is about \$20 billion.

From Russia's perspective, the idea is to by-pass Ukraine and Turkey, but the existing pipeline through Ukraine transports 130 BCM, so Ukraine will retain its dominant position. Moreover, maritime rights with either Ukraine or Turkey will have to be agreed, thereby negating a least part of the key advantage of this project from Russia's perspective.

**Nabucco.** The Nabucco pipeline is a planned natural gas pipeline from Erzurum, Turkey through Bulgaria, Romania, Hungary to a major natural gas hub at Baumgarten an der March, Austria. It is a partnership of five companies, with one company from each of the five countries through which the pipeline runs. Construction is expected to begin in 2010 and be completed in 2014. It is a significant part of the European strategy for diversification of energy sources. The initial source of natural gas for the pipeline would be gas from Azerbaijan through existing pipelines that link Azerbaijan gas to Turkey. There are estimates, however, that Azeri gas supplies are inadequate to justify construction of the pipeline, so additional supplies are sought. Turkmenistan is expected to feed the pipeline also, either through pipelines in Iran or through the proposed complicated Trans-Caspian pipeline across the Caspian Sea. If the Trans-Caspian pipeline were constructed, Kazakhstan could also become a supplier to the pipeline. Egypt and Iraq could supply the pipeline through the Arab Gas Pipeline. Finally, Iran

could also supply the pipeline, but this is opposed politically by the European Union and the United States.<sup>13</sup>

**Trans-Caspian Pipeline.** The proposed Trans-Caspian gas pipeline would run under the Caspian Sea from Türkmenbaşy in Turkmenistan to the Sangachal Terminal in Baku Azerbaijan. From Baku it would connect with the existing South Caucasus pipeline through Tbilisi to Erzurum in Turkey, where in turn it would be connected to the Nabucco pipeline, thus taking natural gas from Turkmenistan to Central Europe. According to some proposals it would also include a connection from the Tengiz field in Kazakhstan to Türkmenbaşy. Thus, the Trans-Caspian pipeline would link Turkmen and possibly Kazakh gas with central Europe through a route independent of both Russia and Iran. The estimated construction cost is \$5 billion.

In 2008, a German and Austrian company set up a joint venture named the Caspian Energy Company, to carry out exploration for a gas pipeline across the Caspian Sea that would feed into the Nabucco pipeline. Based on exploration outcomes the company plans to build and operate a gas transport system across the Caspian Sea. Both Russia and Iran, however, oppose the Trans-Caspian pipeline project and have objected on environmental grounds. Both nations maintain that any pipeline built under the Caspian Sea would require the approval of all five countries that border the Sea.

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<sup>13</sup> For further details on the Nabucco pipeline see the Wikipedia article at [http://en.wikipedia.org/wiki/Nabucco\\_Pipeline](http://en.wikipedia.org/wiki/Nabucco_Pipeline).

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