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Europe's Dependence on Russian Natural Gas: Perspectives and Recommendations for a Long-term Strategy

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Europe's Dependence on Russian Natural Gas: Perspectives and Recommendations for a Long-term Strategy*

By Richard J. Anderson**

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Chapter 1 – Russia and the European Natural Gas Market

Introduction

The European Union 27 currently rely on Russia for almost 38% of their imported natural gas;¹ this dependency will become significantly greater if European states implement their currently formulated energy policies. With plans to phase out nuclear power in several European countries, the EU goal to reduce coal consumption thereby lowering greenhouse gas emissions, and the depletion of domestic sources of gas, reliance on Russia will rise to 50 to 60% of all gas imports within the next two decades if different energy policies are not adopted.² *The EU and greater Europe will soon find themselves in an extremely dangerous position due to the ever-increasing dependence on Russian natural gas. These countries must work together now to produce a coherent diversification strategy.*

While the current EU energy policy is forward thinking in its targets for renewable energy, economizing, and emission reduction, it falls short in its failure to recognize the security threat of the increasing dependence on Russian hydrocarbons – in particular, natural gas. This paper proposes a diversification strategy with concrete steps that can be taken in a variety of energy policy areas to create, over the long-term, a more balanced approach to meeting energy needs. Europe must undertake such a strategy not only because over-reliance on any one source represents unsound policy, but more importantly because domination of the European market has been a clear and calculated goal that an unreliable Russian administration has been working towards for several years. Russian domination of the European natural gas market would give the Kremlin incredible leverage in its dealings with its European neighbors. Europe's dependence on Russia for natural gas already profoundly affects the freedom of action of certain European states and will increasingly erode European sovereignty. Several factors could mitigate Russia's capability to monopolize natural gas markets on the European continent. This article also discusses these factors, in particular in the context of the kind of steps greater Europe could take to ensure Russia does not realize its goal of reasserting coercive influence through its 'energy weapon.'

Why Natural Gas is so Critical in the Energy Mix

Natural gas plays a critical role in energy consumption worldwide; Europe is no exception. The EU accounts for 17% of world energy consumption and uses the same proportion of annual world natural gas production.³ Analyzing energy by source, EU usage breaks down into the

¹ For consistency throughout this paper, natural gas figures will be stated in cubic meters. While the EIA typically presents data in cubic feet, the unit for measurement in Europe is the cubic meter and the unit volume for commodities trade is generally 1,000 cubic meters of natural gas. The figure mentioned above was derived from Gazprom's statement, verified by independent sources, of deliveries of 156.1 billion m³ to the EU 27 in 2005 and then comparing it to BP's figures for 2005, for European imports of both pipeline gas and liquefied natural gas (LNG). Total European gas imports were 413.46 billion m³, of which 356.86 billion m³ were delivered by pipeline and 47.6 billion m³ via LNG on containership.

² Based on estimates from Commission of the European Communities, "Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy," Brussels, 2006; p. 3; and Energy Information Administration, "International Energy Outlook 2006," http://www.eia.doe.gov/oiaf/ieo/nat_gas.html.

³ In 2003, the EU used 73.7 quadrillion (10¹⁵) British Thermal Units (Btu) of energy, which amounted to 17% of the world's total energy consumption. EU natural gas consumption in 2005 was 17.1% of the world total. In comparison, the United States consumed 24% of the world's total energy usage in 2003. Energy Information Administration, "Country Analysis Briefs: European Union," http://www.eia.doe.gov/emeu/cabs/European_Union/Full.html and *Quantifying Energy: BP Statistical Review of World Energy 2006*, p. 27, <http://www.bp.com/live>

following categories: oil 43%, natural gas 24%, nuclear 14%, coal 13%, hydroelectric 4%, and other renewable sources (such as geothermal, biomass, wind, and solar) 2%.⁴ Contrary to popular conception, the vast majority of electric power is generated through the burning of hydrocarbons to heat water for steam to run turbines. Hydroelectric, nuclear, and renewable sources of electricity combined create far less than is produced by gas, coal, and oil. Additionally, natural gas is the preferred hydrocarbon for electric power generation because it is the cleanest burning and is comparable in price to coal.⁵ Despite this, natural gas is probably best known to the consumer for its domestic uses for heating, cooking, and cooling; residential usage accounts for approximately 22% of overall natural gas consumption.⁶

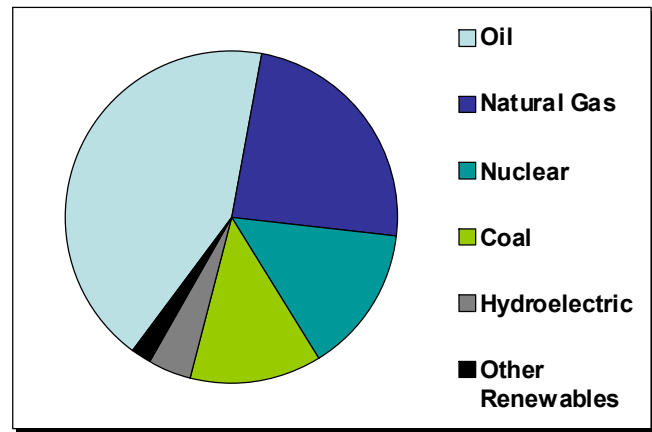


Chart 1: EU Energy Usage by Type (Chart by Author)

In addition to commercial power production, many industrial applications depend on natural gas. It is the basis of many chemical products, fertilizers, and pharmaceuticals because it is a cheap source of butane, ethane, and propane. Additionally, it is the base ingredient for various plastics, fabrics, and anti-freezes. In a compressed form, it is a fuel source for combustion engine vehicles. While relatively few natural gas filling stations exist, public busses in Europe increasingly use this fuel, which pollutes far less than gasoline and diesel fuels.⁷ Given the multiple uses of natural gas, its advantageous price in relation to renewables, and the emission control advantages, most energy projections show natural gas growing to about one-third of the entire European energy mix by 2030, pulling almost even with oil in relative importance.⁸

Fragmentation of Pricing and the European Natural Gas Market

Due principally to the potential of pipeline and container vessel, oil trades at market prices that vary only moderately worldwide (3.7% in 2005). In contrast, gas in its natural state can be delivered economically only by pipeline, making it far more susceptible to regional pricing (31% price variance by location in 2005).⁹ As a result, natural gas suffers from highly fragmented

[assets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_blue_energy_review_2006/STAGING/local_assets/downloads/pdf/natural_gas_section_2006.pdf](#).

⁴ Ibid.

⁵ They are almost the same price per Btu produced. "The Uses of Natural Gas," NaturalGas.org, <http://naturalgas.org/overview/uses.asp>.

⁶ Ibid. Because of the intense infrastructure needed for residential consumption, this usage of natural gas plays a particular role in any discussion of a diversification strategy; this specific topic will be addressed again later in this paper.

⁷ Ibid. Natural gas produces 70 percent less carbon monoxide, 89 percent less non-methane organic gas, and 87 percent less nitrogen oxides than gasoline and diesel powered vehicles. It has become the public transport fuel of choice in California and in European cities where emission standards are critical.

⁸ Based upon Energy Information Administration, "World Total Energy Consumption by Region and Fuel, Reference Case, 1990-2030," http://www.eia.doe.gov/oiaf/ieo/pdf/ieorefab_2.pdf and Commission of the European Communities, "Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy," Brussels, 2006.

⁹ A comparison of the historical prices of natural gas and spot crude makes the regionalization factor clear. In 2005, the average price for spot crude was \$56.59 per barrel for West Texas Intermediate and \$54.52 for Brent, a

pricing; its cost varies substantially due to a variety of factors including wellhead, long-distance transportation, and local distribution costs.

Natural gas can be liquefied by a process of cooling it to -260 degrees F [-162 degrees C], which reduces its volume 600 times, making it transportable by container ship. Since this process is expensive, for most economies liquefied natural gas (LNG) only supplements pipeline gas.¹⁰ Liquefying natural gas requires exceptionally large facilities (commonly referred to as trains) where only economies of scale make the process viable. This further limits the exporting and importing of LNG to producers and consumers capable of investing in multiple hundred million dollar terminals. The fact that transportation of natural gas in a liquefied state by container ship causes some to be lost due to vaporization en route further complicates and fragments pricing.¹¹ While pipeline gas is also lost in transit due to inevitable pipeline leaks, the length and duration of shipment plays a greater role in the economics of LNG transport, compounding the tendency of price regionalization in both the gaseous and liquefied forms of the commodity.

In Europe, with only three main external suppliers,¹² natural gas normally sells in long-term contracts of up to 25 years. The contracts typically obligate the buyer to purchase a set minimum amount, protecting the producer who must make large investments in not only exploration, but also in pipelines, pumping stations, and storage facilities. Pricing of natural gas in Europe depends primarily on what the market will bear in relation to the prices of alternative fuels.¹³ Because oil is the closest substitute for natural gas, oil prices drive the price of gas. The huge increases in oil prices over the past several years have brought with them corresponding hikes in European natural gas prices, in large part because long-term gas contracts usually include variable pricing to compensate for swings in the prices of petroleum products. This regionalization of price due to the difficulty in off-setting pipeline gas with LNG and the overall reliance on limited long-term contract providers of gas demonstrate how much more leverage a gas provider has than an oil producer in setting the pricing terms. Until LNG becomes a world commodity like oil with more economical tanker delivery, fragmentation of natural gas prices will continue. That said, the severity of regional price differences is slowly decreasing.¹⁴

3.7% difference in price, primarily due to quality levels. While oil prices varied only very slightly worldwide, natural gas dramatically showed the effects of regional markets. Natural gas prices in the US averaged \$8.79 per million Btu, whereas in the EU they averaged \$6.28 and in Japan, because of a favorable long-term LNG contract with Malaysia, only \$6.05. Worldwide prices for different forms of natural gas varied as much as 31%. Oil and gas pricing data from British Petroleum Statistical Review, "Spot Crude Prices: From 1972" and Natural Gas Prices – from 1984," http://www.investis.com/bp_acc_ia/stat_review_05/htdocs/reports/report_20.html and http://www.investis.com/bp_acc_ia/stat_review_05/htdocs/reports/report_21.html.

¹⁰ The three nations that rely almost exclusively on LNG are Japan, South Korea, and Taiwan. Based on Energy Information Administration, "LNG Importers," <http://www.eia.doe.gov/oiaf/analysispaper/global/importers.html>.

¹¹ LNG tanker ships use insulation rather than refrigeration to keep their cargo liquefied. The result is that the longer the trip, the more gas will vaporize – at least until newer technology ships that re-liquefy this vapor are devised. Nick Blenkey, "LNG boom continues," MarineLog.com, http://www.marinelog.com/DOCS/PRINTMMV/MMV_Feblng1.html.

¹² Russia, Norway, and Algeria account for virtually all pipeline gas imports to the EU. Turkmen gas is sold to Ukraine, but is transported through Russia via Gazprom.

¹³ United Nations Conference on Trade and Development, "Natural Gas – Prices," <http://r0.unctad.org/infocomm/anglais/gas/prices.htm>.

¹⁴ Prices from 1995 show that the trend toward commoditization of world gas has improved significantly. US natural gas prices averaged \$1.69 per million Btu while Japan was paying \$3.46 – over twice as much. In a decade, the worldwide price differences have decreased from 200% to 31% - mainly due to the effect of LNG.

For the aforementioned reasons, a large regional gas exporter can be a price-setter rather than a price-taker. As a gas producer and exporter, the Russia Federation has no peer. In 2005, Russia produced 22% of the world's natural gas.¹⁵ With 47.55 trillion cubic meters of natural gas (m³),¹⁶ Russia possesses 27.5% of the world's reserves. The next closest in terms of proven resources are Iran, with 15.9% of world reserves, and Qatar, with 14.9%. No other individual country accounts for more than four percent of world gas reserves. Russia has the natural gas equivalent of Saudi Arabia's dominance (25%) in the world's oil reserves.¹⁷ Because of the phenomenon of regionalized pricing in natural gas, Russia's dominant position on the European market gives it leverage far greater than that of a typical energy producer.

Europe's Increasing Reliance on Imported Hydrocarbons

The European Union (EU) currently imports 50% of its energy requirements in the form of hydrocarbons. Projections for the next 20-30 years predict these imports will rise to 70% of all energy consumed in the EU.¹⁸ Numerous factors simultaneously drive the increased reliance on external sources of hydrocarbon energy. Primary among these is the simple fact that most of European oil and gas resources are either depleted or in decline.¹⁹ Within Europe (excluding Russia), the prospects for domestic production are virtually non-existent, as many countries have no reserves. Currently, only Norway and the Netherlands, at 1.4% and 1% of natural gas world reserves, provide a limited intra-Europe offset to absolute dependency,²⁰ however, an unsubstantiated claim of a large gas field in Hungary could slightly alter the market dynamics in Central Europe.²¹

While domestic natural gas supplies in continental Europe are dwindling, coal remains in abundant supply. Poland, Serbia, Germany, and the Czech Republic alone have combined recoverable coal reserves in excess of 47 billion tons.²² The Kyoto Protocol carbon dioxide emissions targets preclude increasing coal's usage for generating electricity. In accordance with

¹⁵ *Quantifying Energy: BP Statistical Review of World Energy 2006*, p. 24, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2006/STAGING/local_assets/downloads/pdf/natural_gas_section_2006.pdf.

¹⁶ Energy Information Administration, "International Energy Outlook 2006," http://www.eia.doe.gov/oiaf/ieo/nat_gas.html.

¹⁷ Energy Information Administration, "Saudi Arabia," <http://www.eia.doe.gov/emeu/cabs/saudi.html>.

¹⁸ Commission of the European Communities, "Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy," Brussels, 2006, p. 3.

¹⁹ The following data puts the EU's growing dependence on imported natural gas in perspective: in 2005 the EU produced 7.2% of the world's gas, but used 17.1% of the world's total. At current R/P ratios the EU's domestic sources of natural gas will last 12.9 more years. In reality, some countries will run out sooner and others, such as the Netherlands, will have gas production for at least a few more decades.

²⁰ Energy Information Administration, "International Energy Outlook 2006," http://www.eia.doe.gov/oiaf/ieo/nat_gas.html.

²¹ At the time of the writing of this paper, unsubstantiated reports that the Canadian firm Falcon Oil and Gas Limited had found a field of 509 billion to 1.28 trillion m³ of gas in Hungary were published. If confirmed, this would represent about 0.7% of world reserves and give Hungary over 100 years of gas supply at its current rate of consumption. Even if the high end of this estimated reserve is recoverable, it still represents less than three percent of Russian reserves. While it would give Hungary gas independence and the capability to be a net gas exporter, it still would be only a minor offset to Russian dominance in European markets. Since Falcon Oil and Gas has not confirmed the content of these reports, it remains to be seen the true extent of the field. Michael Logan, "Europe Swiped in 'Friendship' Fight," *The Budapest Times*, January 15, 2007, <http://www.budapesttimes.hu/index.php>.

²² Energy Information Administration, "Coal Reserves," <http://www.eia.doe.gov/pub/international/iea2004/table82.xls>.

the Kyoto Protocol, the goal for greenhouse gas emissions for the EU-15 in the period 2008-2012 is to be 8 percent lower than 1990 levels.²³ Natural gas, as the cleanest burning of the hydrocarbons, becomes the fuel of choice to reduce emissions and yet meet energy demands, despite the relative abundance of coal, particularly in Central Europe.

Nuclear power could also be a significant offset to gas-produced electric power, but there is strong social and political resistance to its use in countries such as Austria, Denmark, Norway, Portugal, Spain, and Sweden. Germany's decision to be free of nuclear power by 2023²⁴ will greatly increase its reliance on hydrocarbons to generate electricity over the coming decade, in particular natural gas. France's decision in 1973-74, after the first oil shocks, to bolster its nuclear power generation industry shows the extent to which this source can reduce foreign dependence on hydrocarbons. With 56 nuclear reactors annually producing 430 terawatt-hours, it is estimated that France saved €13.5 billion in 2006 by not relying as heavily on imported natural gas and also reduced emissions of CO₂ by 128 million tons.²⁵ A comparison of the electricity sectors of France and Germany vividly illustrates the effects of a nuclear diversification strategy. France consumed 85% of the electric power that Germany did in 2003, 433.3 billion kilowatt-hours (kWh) versus 510.4 billion kWh. 77% of France's electricity was nuclear-generated, with only 8.2% coming from fossil fuel. Germany's mix was 29.9% nuclear and 61.8% fossil fuel. France imported 40 billion m³ of natural gas to Germany's imports of 85 billion m³.²⁶ In essence, Germany annually spends almost 1% of its GDP for the import of natural gas.²⁷ This figure will rise significantly as Germany phases out nuclear power.

Renewable energy sources also provide excellent opportunities for diversification from gas-produced electricity, but progress has been slow in Europe for economic reasons – renewables currently cost more than other methods of electricity generation. The production cost of one kWh of electricity from gas-powered and nuclear power plants both average 3.2 € cents; the far more heavily polluting coal-fueled power generation is comparable at 3.7 € cents per kWh.²⁸ In comparison, electricity produced by a turbine in an average wind location costs about 8€ cents per kWh, making it more than twice as expensive as gas, coal, and nuclear.²⁹ Other renewable forms of electric power generation cost even more, making natural gas the apparent choice for power generation while simultaneously reducing levels of pollution.

²³ Energy Information Administration, "Country Analysis Briefs: European Union," http://www.eia.doe.gov/emeu/cabs/European_Union/Full.html.

²⁴ "Germany Committed to Phasing Out Nuclear Power," *Deutsche Welle*, May 1, 2006, <http://www.dw-world.de/dw/article/0,2144,1845437,00.html>.

²⁵ "Nuclear Power Saves France 16 Billion Euros Import Costs in 2006," *Platts*, January 12, 2007, <http://www.platts.com/Nuclear/News/8826117.xml?src=Nuclearrssheadlines1>.

²⁶ CIA World Factbook, "France" and "Germany," <https://www.cia.gov/cia/publications/factbook/print/gm.html> and <https://www.cia.gov/cia/publications/factbook/print/fr.html>.

²⁷ At the time of this writing, the value of 85 billion m³ of natural gas was about 21-22 billion dollars, depending on the terms of the gas contract. This equates to slightly less than 1% of Germany's annual GDP.

²⁸ Miklos Losoncz, "Analysis: Energy Dependence and Supply in Central and Eastern Europe," *EurActiv.com*, <http://www.euractiv.com/en/energy/analysis-energy-dependence-supply-central-eastern-europe/article-155274>.

²⁹ While electricity produced from the most modern coastal turbines in an ideal wind location can cost as low as 4.1 eurocents per kWh, realistic planning figures for average wind locations are double this amount. *Ibid* and Erik Morthorst, "Wind Energy: The Facts - Volume 2 Cost and Prices," p. 13, http://www.ewea.org/fileadmin/ewea_documents/documents/publications/WETF/Facts_Volume_2.pdf.

Europe's Energy Dependence on Russia

Most of the EU's natural gas comes from only three external producers – Russia, Norway, and Algeria. At 37.7% of the EU 27's total gas imports in 2005, Russia is by far the biggest gas supplier to the continent.³⁰ Generally, the farther east one goes in Europe, the greater the reliance on Russian gas imports, to the extent that seven European states of the former Warsaw Pact and Soviet Union rely on Russia for over 99% of their natural gas. Almost all Central and Eastern

Country	Quantity (in billion m ³ /year)	% of Domestic Consumption
Estonia	1.3	100
Latvia	1.4	100
Lithuania	2.8	100
Moldova	2.8	100
Belarus	19.8	99
Bulgaria	2.8	99
Slovakia	6.4	99
Finland	4.6	98
Greece	2.2	82
Czech Republic	7.2	77
Austria	6.0	69
Turkey	14.3	65
Hungary	9.0	64
Slovenia	0.56	52
Poland	6.0	43
Germany	36.5	42
Ukraine	24.0	35
Italy	24.2	31
France	11.5	28
Romania	3.9	22
Netherlands	2.7	6

Table 1: Russian Natural Gas Imports as a Percentage of Domestic Consumption³⁴

European countries depend on Russia for the majority of their natural gas consumption.³¹

Looking 25 years out, it is estimated that 80% of the EU's natural gas will be imported, with Russia providing up to 60%,³² equating to one-fifth of the overall EU energy mix coming from Russia in the form of pipeline natural gas. This figure does not include the energy the EU will import from Russia in the form of oil, which is estimated to be as much as another one-tenth of the total energy mix.³³ Thus, as the world's major price-setter for natural gas, Russia—supplying one-third of the EU's energy in 2030—will be in a position to use its energy supplies as levers of control by dictating terms. The negotiations that transpired with Ukraine at beginning of 2006 and with Belarus in the closing days of 2006 show the huge economic and political leverage Russia commands with countries dependent on its energy.

A common phrase that is often repeated in European political discussion is “the EU and Russia are mutually dependent on one another respectively as buyer and supplier of energy.” This conventional wisdom oversimplifies the situation, perhaps in an attempt to make the facts palatable to EU constituents. Realistically, without serious concerted efforts on the part of the

³⁰ See explanation in note 1.

³¹ Miklos Losonecz, “Analysis: Energy Dependence and Supply in Central and Eastern Europe,” EurActiv.com, <http://www.euractiv.com/en/energy/analysis-energy-dependence-supply-central-eastern-europe/article-155274>.

³² Based on estimates from Commission of the European Communities, “Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy,” (Brussels, 2006), p. 3, and Energy Information Administration, “International Energy Outlook 2006.”

³³ The EU currently relies on Russia for 30% of its oil imports. This estimate is based on Russia keeping a proportional share of the projected European oil market. Energy Information Administration, “International Energy Outlook 2006” and “Country Analysis Briefs: Russia,” <http://www.eia.doe.gov/emeu/cabs/Russia/Full.html>.

³⁴ Ukraine's 35% is misleading, as almost all natural gas in Ukraine is delivered by Gazprom; the bulk of their gas is from Turkmenistan but with Russia as the middleman. Belgium, Denmark, Ireland, Portugal, Spain, Sweden, and the UK rely on Russia for less than 1% of their natural gas. For the UK (depleting domestic sources) and Sweden (phasing out nuclear power), this percentage will increase dramatically in the next 10 years. 2004/2005 data is used for consistency and completeness; some countries' level of dependency has grown during the intervening time, such as Hungary. Based upon numerous sources, primary: Bernard A. Gelb “CRS Report for Congress, Russian Natural Gas: Regional Dependence,” <http://www.fas.org/sgp/crs/misc/RS22562.pdf>.

EU states, Russia will have the upper hand in this relationship. Energy demand, particularly in highly developed economies, is not price elastic. Quite simply, demand will remain constant almost without regard to price; given the choice of a cold, dark home or paying exorbitant prices, Europeans will do the latter. The mutual dependence theory espoused by European politicians also fails to take into account how Russia has been using these hydrocarbon revenues; Russia has been accumulating a large part of them in an oil stabilization fund. Since this revenue is not going to non-discretionary funding, it strongly indicates that Russia could show more perseverance if these revenue streams were interrupted than their European customers could tolerate disruptions in energy supply.

The Effect on the European Market of Opening Pipelines to China

Another sobering thought is that while Europe is now Russia's primary gas customer, the booming economy of China makes alternate pipeline routes to the south and east economically viable. One supplier with two voracious customers is a prospect that has not eluded planners in the Kremlin. Europe has only a few more years of convincing itself that a reciprocal dependence relationship occurs; with gas routes to Asia, Russia will have increased demand and a choice of customers. Just as Russia was able to shut off natural gas to Ukraine on January 1, 2006, diversification of its customers will give Russia enormous levers of power and control if Europe does not quickly diversify from its increasing gas dependence.

According to press releases from Gazprom, Russia's 50% state-owned natural gas consortium, which controls 17% of the world's gas reserves and over 60% of Russia's reserves, gas shipments to China will commence in 2011 when the Altai pipeline is completed.³⁵ China's natural gas consumption in 2004 was only slightly higher than its domestic production, 47.5 billion m³. By 2011, China's gas consumption is expected to more than double to 103-120 billion m³/year.³⁶ Gazprom's plan is to invest \$4.5 - \$5 billion to build a pipeline stretching 2,800 kilometers, which would allow delivery of gas from Eastern and Western Siberian fields to Northern China. Gazprom estimates that the capacity of deliveries to China could reach 68 billion m³ per year in the next decade.³⁷ In 2005, Gazprom exported 156.1 billion m³ to the EU 27 and 76.6 billion m³ at subsidized rates to former Soviet Union countries, with Ukraine accounting for almost half of the former Soviet Union consumption.³⁸ It should be added that Gazprom, as sole owner of Russia's Unified Gas Transportation System (UGS) – a network of pipelines and gas compressor stations that stretches 155,000 kilometers – has exclusive rights to export Russian natural gas.³⁹ The implications of this are quite important for the European consumer. Within four to five years, the Russian government, through its agent, Gazprom, will have a market and delivery means to China for approximately 30% of the gas it currently sends west. The leverage that this choice of customers provides will allow Russia to write extremely

³⁵ Gazprom Corporate Website, "Altai Project," <http://www.gazprom.com/eng/articles/article22202.shtml>.

³⁶ Ibid.

³⁷ Ibid.

³⁸ Gazprom's official statements on exports to greater Europe and former Soviet Union countries are somewhat confusing, as these two figures are not exclusively gas produced by Gazprom. These total exports are 232.7 billion m³, but 25% of this total is gas from Central Asia, for which Gazprom provides transit. Gazprom Corporate Website, "Europe," <http://www.gazprom.com/eng/articles/article20160.shtml> and Aleksander Medvedev, "Gazexport: Achievements and Prospects," *International Affairs*, Vol. 52 No. 5, 2006, p. 147.

³⁹ Gazprom Corporate Website, "Annual Report 2005," http://www.gazprom.com/documents/Annual_Report_Eng_2005.pdf, p. 54-55.

favorable long-term supply contracts.

Perhaps the most alarming aspect of the China market for Europe is not only the demand aspect, but the fact that Russia may soon prefer to deal with China. A quick look at the map shows that Russian gas can pass directly to China with no transit countries. For Gazprom, this means no transit fees and no negotiations of terms with unreliable transit partners. Russia's experience with Ukraine and Belarus in early and then late 2006 were two-sided; they indicated not only the leverage that Russia exerts with natural gas, but also the price concessions that must be given to allow gas transit on to their EU customers who pay full prices. The prospect of Chinese partners paying market prices without the fear of siphoning or transit duties is enticing. One final alluring aspect of the Chinese market is that it is far closer to potential Eastern Siberian fields⁴⁰ than European consumers, again being preferable to Gazprom from an economic and infrastructure perspective. Pipelines have leakages and also require pumping stations to move the gas under pressure through the pipes; the farther the transit, the more expensive and the higher the rate of gas loss.

Russian Gas versus Oil

EU diversification away from Russian natural gas is far more critical than from Russian oil, even though Russia may be a provider of up to 11% of the EU's overall energy in the form of oil over the next two decades. While oil will almost certainly generate huge revenues and favorable trade balances for Russia, it will not be as likely a source of Russian political and economic leverage as natural gas. There are several reasons for this assertion.

First, estimates of Russia's total share of the world's known oil reserves range from 4.5% to 6%.⁴¹ Russia ranks eighth in the world for oil reserves – a far cry from its dominant position in the world's percentage of natural gas.⁴² Even using figures for reserve growth and still undiscovered fields, the most favorable estimates for Russia rise to 281 billion barrels, representing 9.5% of the world's oil supply in a best-case scenario. In line with these estimates, the U.S. Energy Information Administration predicts Russia will produce about 8.5% of the world's export oil in 2030.⁴³ This capacity is impressive and worth billions of dollars per year, but it is not significant enough to give Russia a price-setting role in world markets. Quite simply, European consumers have the option to look elsewhere if they do not like Russian oil terms.

A second key reason oil will not provide Russia the same leverage over Europe is that oil does not experience the same fragmentation and regionalization of price that gas does. Easily and economically transported by container ship, oil can be sold to markets worldwide. Unloading oil at ports is far simpler than the regasification process required for LNG. Russia's dominant position in the European gas markets gives it pricing power as well as the upper-hand in negotiating long-term contracts. With this leverage, Gazprom has been highly successful at writing contracts that roughly peg the price to petroleum products, but with clauses protecting

⁴⁰ Most notable among these fields is the giant Kovykta, over which the Russian government is actively trying to regain control from the consortium TKN-BP.

⁴¹ Proven reserve figures for Russian oil vary from a low of 60 billion barrels to a high of 74 billion barrels. Data from *BP Statistical Review* and *Oil and Gas Journal* as cited in Energy Information Administration, "World Proved Reserves of Oil and Natural Gas, Most Recent Estimates," <http://www.eia.doe.gov/emeu/international/reserves.xls>.

⁴² Energy Information Administration, "International Energy Outlook 2006: World Oil Markets," <http://www.eia.doe.gov/oiaf/ieo/pdf/oil.pdf>.

⁴³ Ibid. Russia and Caspian region exports as a percentage of the entire world export estimate for oil in 2030.

the seller.⁴⁴

Russia's ability to dictate prices is even greater with Eastern European and former Soviet countries that are entirely reliant on Russia for their natural gas. The recent natural gas deal signed with the Republic of Georgia exemplifies this fact. Despite a dramatic fall in oil prices from their 2006 summer highs, in December Gazprom locked in a gas price of \$235 per 1000 m³ for gas throughout 2007.⁴⁵ This price basically mirrored that paid by Western European consumers who had locked in prices when oil was significantly higher.

While the LNG market has grown significantly and the number of short-term contracts is increasing, it is difficult to predict whether natural gas in its pipeline form and LNG will become a single commodity with relatively similar prices worldwide any time soon. Regardless, Europe would have to invest more than it has already in regasification sites to be able to import enough LNG to offset the huge expected increase in demand for Russian pipeline-delivered gas. Because of all these factors, Europe could look for another seller of oil in the face of unreasonable terms from Russia, while natural gas, in both its pipeline and LNG form, usually require lengthy procurement lead times, often up to eight years, tied to long-term contractual agreements. Europe could easily find itself reliant on Russian natural gas for 20% of its energy requirement and for reasons of time, quantity, and deliverability, have insufficient alternatives on the world market if Russian terms were excessively demanding.

To put a monetary value on this level of gas reliance, given consumption projections and assuming Gazprom could meet the demand, the EU could conceivably be importing 270 billion m³ per year from Russia by 2030.⁴⁶ At average contract prices of \$230-250 per 1000 m³, which equals \$65 billion per year. Since gas and oil prices will certainly be higher in two decades, especially given that oil and gas exploration in the future will be far more expensive as the economically easy to exploit locations are being depleted, the real figure will be far higher.

The Possibility of a Gas Cartel

In November 2006, a confidential study by NATO economics analysts was leaked to news agencies. Although publicly unavailable, the basic tenet was that Russia may be attempting to build a gas cartel including Algeria, Qatar, Libya, the former Soviet Republics of Central Asia, and perhaps Iran.⁴⁷ Deputy Kremlin spokesman Dmitry Peskov responded quickly to the study: "Our main thesis is interdependence of producers and consumers. Only a madman could think that Russia would start to blackmail Europe using gas, because we depend to the same extent on European customers."⁴⁸ This affirmation of mutual dependency seems to have been made only to assuage European politicians, for it deviates from a more recent statement made by Alexander Medvedev, Deputy Chairman of Gazprom, in a December 2006 interview. Medvedev defended

⁴⁴ Aleksander Medvedev, "Gazexport: Achievements and Prospects," *International Affairs*, Vol. 52 No. 5, 2006, p. 149.

⁴⁵ Andrew E. Kramer, "Gazprom of Russia to Double Natural Gas Prices to Georgia," *International Herald Tribune*, December 22, 2006, <http://www.ihf.com/articles/2006/12/22/business/gazprom.php>.

⁴⁶ This figure was derived by taking Russia's 2006 export figure to Europe, 156 billion m³ and then multiplying it by the Energy Information Agency's expected growth rate for European gas consumption to 2030 and then making the assumption that Gazprom, with future exploration, could maintain an even relative share of that growth – a reasonable assumption as long as Gazprom and its partners invest sufficiently in new projects.

⁴⁷ "NATO Fears Russian Plans for Gas OPEC," *Financial Times*, November 13, 2006, <http://www.ft.com/cms/s/af125540-7358-11db-9bac-0000779e2340.html>.

⁴⁸ *Ibid.*

Russia and his firm's actions in conjunction with raising prices to Belarus and Georgia: "If Europe is ready to buy more gas, we are ready to sell more. But if not, we have other customers – for instance, China."⁴⁹

Several reports soon followed the news of the NATO study, suggesting that the likelihood of a gas cartel led by Russia would be extremely small. *Energy Business Review* and *The Financial Times* both published well-reasoned economic analyses of the difficulties Russia would face in establishing and controlling a gas cartel.⁵⁰ Chief among the obstacles would be controlling the agendas of such widely differing partners. Producers would also be unlikely to allow the control over their production allotments necessary to manipulate world supplies, because, as previously noted, many of the aspects of the gas business require large economies of scale to be highly profitable. Gas contracts, often 10-25 years in length, differ from short-term oil contracts, making it difficult for a cartel to program output. The report cited historical in-fighting within OPEC as the likely scenario should gas quotas be imposed on the cartel members. They also noted that major gas consumers, chief among them the European Union, would oppose such a cartel and perhaps even impose trade sanctions in response.

Most of the counter arguments put forth by these journals are correct; however, they have overlooked a critical aspect of the discussion – Gazprom's business practices. At a government-to-government or corporation-to corporation level, harmonizing the agendas of such a cartel would be extremely difficult. However, the foreign investment strategy of Gazprom indicates how a voice inside many of the world's key gas producers can be obtained without coercion. Gazprom, in addition to its monopoly of all Russian exports and the national gas pipeline system, has been buying aggressively large portions of foreign ventures. In Iran, the world's second largest holder of proven gas reserves, Gazprom owns 30% of Phases 2 and 3 of the South Pars field project, expected to come on line in 2009.⁵¹ Despite the political difficulty of controlling such a cartel, the idea is certainly not just restricted to NATO strategists. In January 2007, Iran's Supreme Leader, Ayatollah Ali Khamenei, stated that Tehran and Moscow should seriously consider forming a gas cartel. He noted (incorrectly, since the figure is about 43-44% of world reserves) that Iran and Russia together hold half of the world's total gas reserves, adding that "the two countries through mutual cooperation can establish an organization of gas exporting countries like OPEC."⁵²

In 2006, Russia signed deals with Algeria, eighth in the world in reserves, fifth in current production, and current provider of 16% of Europe's natural gas imports. Gazprom and LUKoil will respectively receive shares in Algerian oil and gas fields in return for the purchase of \$7.5 billion worth of Russian military equipment.⁵³ In Venezuela, ninth in the world in terms of gas

⁴⁹ "Kremlin Insider Defends Russia's Energy Giant," *Newsweek International*, January 29, 2007, <http://www.msnbc.msn.com/id/16735523/site/newsweek/>.

⁵⁰ Carola Hoyos, "The Hurdles for Moscow on Path to Gas Cartel," *Financial Times*, November 13, 2006, <http://www.ft.com/cms/s/054d0d62-7370-11db-9bac-0000779e2340.html> and "Emergence of a Gas OPEC Remains Unlikely Despite NATO Warning," *Energy Business Review*, November 16, 2006, www.energy-business-review.com/article_feature.asp?guid=983705D4-E255-449E-A5F0-FB23844F6A20.

⁵¹ South Pars is the largest gas field in Iran; some estimates are as high as 8 trillion m³ of natural gas. Gazprom Corporate Website, "Business Strategy," <http://www.gazprom.com/eng/articles/article8523.shtml> and Energy Information Administration, "Iran: Natural Gas," <http://www.eia.doe.gov/emeu/cabs/Iran/NaturalGas.html>.

⁵² Radio Free Europe/Radio Liberty Newline, January 29, 2007.

⁵³ Carmen Gentile, "Algeria Trades Oil Rights for Russian Arms," *International Relations and Security Network*, <http://www.isn.ethz.ch/news/sw/details.cfm?id=15542>.

reserves, Gazprom has joint ventures in two of the government's major gas projects – Rafael Urdaneta and Urumaco. Gazprom also has exploration joint ventures underway in Uzbekistan, Kazakhstan, India, Vietnam, and Libya; has feelers out to Angola; brokered a deal in late 2006 with Egypt for the sale of gas equipment in return for exploration rights;⁵⁴ and reportedly is negotiating with other Latin American countries. Additionally, Gazprom has long-term gas transit contracts with Turkmenistan. Russian pipelines supply all of the Central Asian gas sold to the other former Soviet Union countries of Europe, generating revenue and additional control for Gazprom.⁵⁵

Such Russian government endeavors to secure interests in gas production and transportation worldwide undercut the purported improbability of a Russian-led natural gas cartel. Russia, through its proxy Gazprom, seeks to greatly expand its worldwide influence in gas, in part through the acquisition of clout on corporate boards around the globe. This strategy is much more subtle and sophisticated than simply attempting to set production quotas, as OPEC does.

It should also be emphasized that Gazprom differs from the typical multiple hundred billion dollar corporation like ExxonMobil or British Petroleum. Half owned by the Russian government, the assistance of the executive branch enhances its ability to negotiate. For instance, in Algeria, President Putin secured deals for Russian oil and gas in exchange for arms purchases and debt cancellations.⁵⁶ While the connections are not quite as obvious in Iran, the Russian government's willingness to broker weapons deals and nuclear power equipment transfers at the same time the West refers to Iran as a state sponsor of terrorism, certainly gives Gazprom huge advantages when negotiating joint ventures in Tehran. Russia's senior leaders often promote Russia's industries, thereby giving Gazprom a larger voice at the boardroom table than their simple percentage of shares in a particular foreign venture would otherwise suggest.

A probable scenario involves Gazprom as a large minority stakeholder in a major LNG project in the Middle East or North Africa. With its government leverage influencing the decision of where this hypothetical consortium decides to send its LNG shipments, Russia would enjoy enhanced control over Europe's possible sources of diversification from pipeline gas. Since the shortest routes are by far the most economical for LNG shipments, Russian partial interests in the nearest LNG providers could have dramatic effects on the ability to set the terms for Europe's natural gas diversification.⁵⁷ In this hypothetical 'neo-cartel,' Russia does not need its partners to agree to output ceilings. Simply agreeing to sell only to Russian-designated customers would suffice. As long as the price remained similar, Russia's partners would find this far more palatable than the limiting of production, and therefore revenues, as with OPEC.

⁵⁴ Gazprom Corporate Website, "Business Strategy," <http://www.gazprom.com/eng/articles/article8523.shtml> and "Gazprom to Explore Egyptian Gas," *Middle East Times*, December 27, 2006, <http://www.metimes.com/storyview.php?StoryID=20061229-053540-1035r>.

⁵⁵ The majority of this Central Asian gas is sold to Ukraine at less than European market rates. Jonathan Stern, "The Russian-Ukrainian gas crisis of January 2006," *The Oxford Institute for Energy Studies*, January 16, 2006, p. 9.

⁵⁶ Carmen Gentile, "Algeria Trades Oil Rights for Russian Arms," *International Relations and Security Network*, <http://www.isn.ethz.ch/news/sw/details.cfm?id=15542>.

⁵⁷ As already mentioned in footnote 11, in current LNG tanker ships, gas is not refrigerated, so some liquefied gas is constantly vaporizing and being lost. Until there are newer designed ships that use this vaporized gas, shorter duration LNG shipments are far more profitable than longer ones. For this reason, Gazprom can prioritize its portfolio expansion on North Africa and the Middle East as other major LNG producers such as Australia, Brunei, Indonesia, and Malaysia are too far away and will likely continue to focus on the Japanese, South Korean, Chinese, and US Markets.

President Putin, in his February 2007 State of the Nation press conference, noted, “At the first stage, we agree with Iranian experts, partners and some other countries that produce and supply hydrocarbons to world markets in large volumes. We are already trying to coordinate our actions to develop markets and intend to do so in the future.”⁵⁸ Two weeks later, when speaking in Doha, Qatar, Putin qualified this statement stating that, “whether we need a cartel, whether we will create such an organization, is another matter. But of course we should coordinate our activities with other producers.”⁵⁹ Whether intentionally or not, Putin alluded to the most likely way that Russia could increase leverage over gas markets, by coordinating the development of markets and influencing with whom delivery contracts were signed. This would create extra leverage on a projected 2030s EU that will receive 20% of its energy from Russia in the form of natural gas.

As should be apparent, Russia already enjoys immense clout in European energy markets. This situation will only worsen in the absence of some deliberate diversification strategies on the part of the EU. This article will now transition to an analysis of Russian internal politics, which are aimed at making Gazprom a major tool of the Russian government in reasserting its lost status as a world superpower. In addition to Russia having enormous potential leverage through the control of natural gas markets, the Kremlin has adopted a methodical and calculated strategy for realizing this potential.

Chapter 2 – Gazprom and the Russian Strategy

It is commonly thought that liberalization of the Russian energy sector would help decrease the level of dependency of European energy consumers. Multiple corporate suppliers and open access to natural gas transport systems, it was argued, would bring about more favorable and competitive pricing. Access in accordance with the terms of the EU Energy Charter to the Russian Unified Gas Transportation System (UGS) for foreign producers would also increase competition. This chapter will discuss the reasons why the European Union planners would be unwise to count on any such liberalization occurring in the near future in Russia, which has no intention of ratifying the charter.

Gazprom

When examining Russian politics concerning natural gas, the focus of attention lies almost exclusively on Gazprom, the chief company in the natural gas business in Russia. Gazprom, by market capitalization, is one of the three largest corporations in the world.⁶⁰ In 2005, it reverted

⁵⁸ “Russia to Consider Idea of International Gas OPEC,” *RIA Novosti*, February 1, 2007, <http://en.rian.ru/russia/20070201/60048917.html>.

⁵⁹ Radio Free Europe/Radio Liberty Newswire, February 13, 2007.

⁶⁰ With a stock market capitalization of \$270 billion, Gazprom trails only General Electric and Exxon Mobile. Bloomberg, “Gazprom Passes Microsoft as Third Largest Company,” April 28, 2006. [*Supplement: Gazprom was surpassed by PetroChina in November 2007, but: “PetroChina’s share surge means it beat by years a Russian pledge to create the world’s largest company. OAO (Открытое Акционерное Общество: Open Joint-Stock Company; compare to “Inc.” or “LLP” in the U.S.) Gazprom, Russia’s natural gas export monopoly, would become the world’s largest company by market value and top \$1 trillion in “seven to ten years,” Alexander Medvedev, the company’s deputy chief executive officer, said in April 2008, “Gazprom’s market valuation today is \$296 billion.” <http://www.bloomberg.com/apps/news?pid=20601087&refer=worldwide&sid=aQyRJI72Kor8> (accessed July 14, 2008).]*

back to a status of majority ownership by the Russian government following a 10.74% purchase of Gazprom by Rosneftgaz, which is also government controlled.⁶¹ With a 50% stake, the government exercises a deciding voice on virtually all corporate matters. Six of the seats on the company's eleven person board of directors are even reserved for members of the Russian government.⁶²

As the successor to the Soviet monopoly responsible for the production and distribution of natural gas (Gazprom literally translates from Russian as an abbreviation for the words *gas industry*), Gazprom has almost regained the status and level of control it had in 1991 when the Soviet Union dissolved and Gazprom was stripped of its pipelines and fields in the other 14 former Soviet republics. Privatization during the 1990's saw other companies gain footholds in the Russian gas industry, however, this diversification of ownership has ended under President Vladimir Putin's second term; with the assistance of very deliberate policies, Gazprom is regaining its monopoly status. Recall that Gazprom owns 60% of Russia's gas reserves and complete ownership of the pipelines and pumping stations. Additionally, Gazprom owns minority interests in other independent Russian gas producers and numerous foreign consortia. Gazprom officially states that its proven gas reserves are 29.1 trillion m³, but this number includes only reserves fully-owned within Russia.⁶³ Its stake in gas fields abroad includes trillions more cubic meters.

Gazprom extends even further, owning all or parts of 166 subsidiaries. Included among the minority ownerships are the gas distribution industries of Bulgaria, Estonia, Greece, Hungary, Latvia, Lithuania, Moldova, Ukraine, Poland, and the Slovak republic.⁶⁴ As part of the gas deal with Belarus, over the next several years, Gazprom will gain 50% of the equity of Beltransgas, the owner of Belarus' gas distribution network. This will be in addition to the Gazprom-owned Yamal-Europe Pipeline, through which much of Russia's gas transits across Belarus to Western Europe. Gazprom also partners with Western European corporations, giving it minority ownership in gas pipelines and storage facilities in the UK, France, Germany, and Italy. For example, in Germany, Gazprom owns 35% of Wingas, 50% of Wintershall Erdgas, 49% of Ditgaz, and 5.3% of Verbundnetz Gas.⁶⁵ Gazprom is also part owner of the Blue Stream, which sends gas from Russia directly to Turkey via a pipeline running along the bottom of the Black Sea. Gazprom, in cooperation with German gas industry partners, is in the process of constructing a similar structure from Russia to Germany on the Baltic Sea floor – the Northern European Gas Pipeline (NEGP) also known as the Nord Stream. Gazprom also owns banks, hotels, and—discouragingly from the standpoint of an independent media—the major Russian newspaper *Izvestia* and the television channel *NTV*. A conglomerate with incredible power, Gazprom has the backing of the Russian government, huge assets, and, in the ever-increasingly controlled Russian media, its own “spin” machines.

⁶¹ Gazprom Corporate Website, “Shares,” <http://www.gazprom.com/eng/articles/article21713.shtml>.

⁶² Gazprom Annual Report 2005, p. 18.

⁶³ Analysis of the total amount of reserves that Gazprom claims to own indicates that they include only their percentage (61%) of Russian proven reserves wholly-owned. Apparently their reports do not attempt to calculate their joint ownership in foreign projects in Algeria, Iran, and Venezuela, for example, or minority ownerships in independent Russian gas companies. Gazprom Corporate Website, “Gas Resources,” <http://www.gazprom.com/eng/articles/article20150.shtml>.

⁶⁴ Gazprom Corporate Website, “Subsidiaries,” <http://www.gazprom.com/eng/articles/article22042.shtml>.

⁶⁵ Ibid.

Putin, Politics, and Gazprom

As seen in the previous section, during the last several years of Putin's presidency, some overt steps have been taken to reassert Gazprom's monopoly status. The motives behind Putin's nationalization of Russia's gas industry and other Russian strategic resources such as oil are most likely a combination of many desired results and interrelated calculations. Putin genuinely believes that these resources are too important to the needs of the state to be put in the hands of private businessmen who do not have Russian national interests in mind. As a product of the Soviet educational system, undoubtedly his perception of economics still has a centralized planning approach.

Putin made clear his views on the subject of nationalizing strategic national resources in a 1999 article, "Mineral Natural Resources in the Strategy for Development of the Russian Economy," by highlighting the need for the state to maintain high regulatory control of resource extraction industries. In what amounts to a blueprint for his actions in steering Gazprom to the monolith that it has become, Putin stated that a key role for the state to play in the natural resource industries is the "creation of large financial-industrial groups – corporations with an interbranch profile that will be able to compete with Western transnational corporations."⁶⁶ In this article, which was published before his assumption of the Presidency, he also makes it clear that he views the government's support for industries involved in the extraction of strategic natural resources as the means to "make Russia a great economic power with a high standard of living for the majority of the population."⁶⁷ Additionally, he justifies a turn away from privatization by stating that, "the experience of countries with a developed market economy gives us many examples of effective state intervention in the long-term project to exploit natural resources."⁶⁸

Putin gave a more sinister preview of his philosophy on the role of government in controlling strategic aspects of the economy in an article entitled "Russia at the Turn of the Millennium," which he published December 30, 1999, the day before he assumed the role of acting President, replacing the ailing Boris Yeltsin. He stated, "Today's situation necessitates deeper state involvement in the social and economic processes. The state must be where and as needed; freedom must be where and as required."⁶⁹ In almost unprecedented historical fashion, Putin published his manifestoes on the state control of strategic resources, and then actually rose to power to implement them.

It would be incorrect to attribute totally altruistic purposes to Putin's strategy as it is put forth in his academic writings. If the benefit of the people were truly the only motivation, then the current level of shadiness of political and business associations would not be tolerated. The composition of Russian oil and gas companies' senior management makes it clear that politics and business are one and the same. Some prime examples include Dmitri Medvedev, First Deputy Prime Minister of the Russian Federation, who is at the same time Gazprom's Chairman

⁶⁶ Vladimir V. Putin, "Mineral Natural Resources in the Strategy for Development of the Russian Economy," translation by M.E. Sharpe, Inc., contained in *Problems of Post Communism*, Vol. 53, No. 1, January/February 2006, p. 49. Translation of the original article published by the St. Petersburg Mining Institute in 1999.

⁶⁷ Ibid. p. 51.

⁶⁸ Ibid. p. 52. Author's re-translation of the article, which has translation inaccuracies that lose some of Putin's nuances, such as *vmeshatelstvo*, which is translated as involvement, when in actuality it means *interference* or at least *intervention*.

⁶⁹ Vladimir Putin, "Russia at the Turn of the Millennium," <http://www.geocities.com/capitolhill/parliament/3005/poutine.html>.

of the Board of Directors.⁷⁰ There is also Alexei Miller, a former Deputy Minister of Energy of the Russian Federation and long-time Putin ally from their association in the St. Petersburg mayor's office, who is Gazprom's CEO. Gazprom's corporate statements emphasize the fact that board members who are also Russian government employees have no shares or extremely limited holdings in the company.⁷¹

Despite the outwardly benign appearance of simple governmental oversight, the case of Rosneft, the Russian government-owned oil analog to Gazprom, illustrates how hundreds of millions of dollars can end up in the personal accounts of Russian officials when assets are sold in closed auctions with prices far below asset value. The most blatant and undisguised of these conflicts of interests is Igor Sechin, Chairman of the Board of Rosneft, Russia's second largest oil company. He is officially listed on the Kremlin's website as Deputy Chief of Staff of the Presidential Executive Office, Aide to the President. Sechin was named Chairman of the Board of Rosneft in July 2004, just months after Yukos owner Mikhail Khodorkhovsky was arrested and Yukos' main asset, Yugansneftgaz, was sold to Rosneft at billions of dollars below their market value.⁷² Sechin, coincidentally, is a former army officer with service in Angola (causing many Russians to speculate that he, like Putin, is former KGB) who later worked with Putin in the St. Petersburg mayor's office. Most alarming is that Sechin was a key government official in bringing evidence against Khodorkhovsky; his reward evidently was the position at Rosneft, a company flush with assets, for which it greatly underpaid.⁷³

This murky relationship between politics and quasi-national ownership of businesses basically makes possible corruption at the highest levels. The nature of the government appointments to corporate boards makes this point even clearer – all the above-mentioned individuals are not simply government representatives; at the same time, they are some of the most highly placed members of Putin's administration. This blurs transparency in corporate accountability, further facilitating massive corruption. In addition to the politicians' seats on the corporate board, the very structure of Gazprom makes it supremely conducive to accounting opacity and fraud. With 166 (listed) subsidiaries and joint ventures in dozens of countries in so many different fields, it is impossible for an auditor to verify the legitimacy of the company's accounting.

RosUkrEnergo is a prime example of the creative ways in which money can be moved from corporate to personal accounts in the numerous Gazprom dealings. RosUkrEnergo was established in 2004 as a Swiss-registered company that would act as intermediary between Gazprom and the Ukrainian state oil and gas company, Naftogaz, to broker the sale of Turkmen gas to Ukraine. RosUkrEnergo is 50% owned by Gazprom and 50% owned by two mysterious Ukrainian businessmen, Dmitry Firtash and Ivan Fursin,⁷⁴ whose identities were begrudgingly given to investigators by the Austrian Raiffeisenbank, which holds the proceeds from their 50%

⁷⁰ [Supplement: Medvedev stepped back when he became president in May 2008. He is replaced by former Prime Minister Zubkov, <http://www.iht.com/articles/2008/06/27/business/27gaz.php> (accessed July 14, 2008).]

⁷¹ The highest percentage ownership of shares by a Russian government member of the board is 0.007%. The highest placed officials have no shares. *Gazprom Annual Report 2005*, p. 19-22.

⁷² Yuri Zarakhovich, "Inside the Yukos Endgame," *Time*, August 22, 2004, <http://www.time.com/time/magazine/article/0,9171,901040830-685965,00.html>.

⁷³ Creative accounting of the values of assets, especially when they were obtained for a price greatly below their market value, can create some relatively simple ways to divert corporate funds. This is particularly easy to arrange under the Russian business system with its poor auditing and lack of transparency.

⁷⁴ Catherine Belton, "Gas Trader Emerges from the Shadows," *Johnson's Russia List*, May 3, 2006, <http://www.cdi.org/russia/johnson/2006-103-31.cfm>.

stake. As Gazprom has sole ownership of the Russian gas pipelines and exclusive right to export gas, the logical question to pose is why was a Swiss-registered corporation—earning profits of hundreds of millions per year—really needed? Clearly all the accounting for the movement of Turkmen gas through Russia could be done on the Gazprom ledgers and the sales made directly to Naftogaz. Gazprom already was the middleman, yet a subsidiary was established to introduce other middlemen.

The Ukrainian President, Viktor Yushchenko, denied on Ukrainian television knowing who the owners of the company were that supplies all his country's imported gas.⁷⁵ President Putin, however, pointedly blamed his Ukrainian counterpart for the company.

“Well, you ask Viktor Yushchenko. Gazprom has a fifty-percent stake and the Ukrainian side has a fifty-percent stake. I said to Viktor Yushchenko, ‘we would welcome it if your 50 percent is held directly by Naftogaz Ukraina.’ But this was not our decision. This was the Ukrainian side’s decision. Who the names are behind the 50-percent stake held by Raiffeisenbank, I don’t know anymore than you do, and Gazprom does not know either, believe me. That is the Ukrainian half of the company and you would have to ask them. I said to Viktor Yushchenko, ‘Give Naftogaz Ukraina direct participation. If you don’t want to, let’s set up another company.’ But they did not want to. It was they who proposed that Rosukrenergo supply gas to Ukraine instead of Gazprom. We agreed. The main thing for us was the price formula.”⁷⁶

This statement is strange for two reasons. First, it indicates that the Russian and Ukrainian Presidents themselves directly negotiate business deals and the formation of companies to sell gas. This admission shows the extent to which gas is used for political purposes by Russia’s leader. Second, if taken at face value, it means that Gazprom entered into a business venture involving the trade of several billion dollars worth of gas annually, but they did not even know who their partners were. In addition to this, the Chairmen of Gazprom and Naftogaz have both publicly stated that they believe the gas trade should be handled directly from one company to the other.⁷⁷ Apparently, one is to believe that—despite the fact that both the governments and their nationalized gas companies were against such an entity—it was created anyway. Although impossible to prove conclusively without more evidence, one reason for the arrangement’s existence appears to be the ability to divert funds from corporate accounts to facilitate bribery at the highest levels.⁷⁸

While by many accounts, Gazprom’s corporate accountability has been improving under Putin’s administration, there are still many gray areas that indicate that corruption is rampant.⁷⁹ Putin

⁷⁵ News Broadcast of Ukrainian Television Channel 4, January 24, 2006, as cited in “It’s A Gas – Funny Business in the Turkmen-Ukraine Gas Trade,” Global Witness Publishing Inc, Washington DC 2006, p. 50-51.

⁷⁶ “Interview to Spanish Media, February 7, 2006,” *President of Russia, Official Web Portal*, http://www.kremlin.ru/eng/text/speeches/2006/02/07/2343_type82916_101277.shtml

⁷⁷ “It’s A Gas – Funny Business in the Turkmen-Ukraine Gas Trade,” Global Witness Publishing Inc, Washington DC 2006, p. 50.

⁷⁸ Ibid, p. 56.

⁷⁹ In addition to this and other suspicious gas transfer arrangements are dubious payments for materials. Specific examples include a 1% increase in the cost of pipeline materials in Ukraine from 2003 to 2004, yet Gazprom’s reports indicated a 35% price increase. Similar exorbitant costs have been noted in the prices paid for pipe in the Blue Stream project to Turkey and in Siberia - cost overruns to the extent they are clearly cases of corporate malfeasance. In the Turkish example, several officials were jailed for corruption, whereas their Russian counterparts who paid even more irrational sums for materials did not even get investigated. Ibid. See also

and his associates probably rationalize their methods of operation: they provide the necessary leadership for strategic industry and that in turn justifies the huge amounts of money skimmed away from corporate treasuries. There is a perverse logic to the actions of the Kremlin over the last several years. By creating a nationalized gas monopoly, Russia, through Gazprom, will be able to extort higher prices from foreign consumers. At the same time, the government can continue to provide gas within Russia and to loyal partner states, such as Armenia, and to a lesser extent Belarus and Ukraine, at greatly reduced state-dictated rates. Within the framework of a Soviet upbringing, it is not hard to image that Putin and his cronies easily justify the money they take for providing such a service to the Russian people and their allies in the ‘near abroad.’ Again, Putin telegraphed this in his pre-Presidential writings when he stated that government regulation in the strategic resources sector would serve to “support and augment the country’s export potential”⁸⁰ and that a primary task for the government was an economic policy that “buttresses the export possibilities of the fuel and energy complexes.”⁸¹

Ukraine – An Example

An example of how the Russian government wields its ‘energy weapon’ less blatantly than simply shutting off the tap, were the negotiations that Russia’s prime minister conducted with his Ukrainian counterpart in October 2006. According to the Russian business daily *Kommersant’s* sources in the Russian and Ukrainian governments, in return for a promise to keep the price of gas below \$130 per 1,000 m³, Kiev agreed to four major concessions: These included (1.) postponing any referendum on NATO membership, (2.) agreeing to the terms of leaving the Russian Black Sea fleet in Sevastopol until 2017 and perhaps even extending the lease, (3.) continuing to use RosUkrEnergo as transit partner for another five years, and (4.) agreeing to receive Turkmen gas through Russia only.⁸²

While Ukraine is an extreme case,⁸³ it makes a vivid example of the coercive power that comes with Russian energy dependence. Ukraine’s officials evidently fear what paying full market prices for gas would do to their economy and are therefore willing to make a variety of concessions that hand over a great deal of their sovereignty to Russia, to the extent that even decisions on collective security and stationing of foreign troops become secondary. Also, given the involvement of RosUkrEnergo in these terms, corruption may play a large part in the concessions as well.⁸⁴ This aspect should not be underestimated, as the ability to corrupt foreign

Michael Freedman and Heidi Brown, “Energy Tsar,” *Forbes.com*, July 24, 2006, http://members.forbes.com/forbes/2006/0724/094_2.html.

⁸⁰ Vladimir V. Putin, “Mineral Natural Resources in the Strategy for Development of the Russian Economy,” translation by M.E. Sharpe, Inc. *Problems of Post Communism*, Vol. 53, No. 1, January/February 2006, p. 52.

⁸¹ Vladimir Putin, “Russia at the Turn of the Millennium,” <http://www.geocities.com/capitolhill/parliament/3005/poutine.html>.

⁸² “The Price of the Vote,” *Kommersant*, October 20, 2006, http://www.kommersant.com/p714949/Referendum_NATO_Ukraine/.

[*Supplement: There have been changes in the agreed price per 1000 m³ and the role of RosUkrEnergo. See <http://www.unian.net/eng/news/news-235920.html> and <http://www.unian.net/eng/news/news-239931.html> (accessed July 14, 2008).*]

⁸³ Ukraine actually receives only 35% of its total gas consumption from Russia. Most of its imports are from Central Asian sources, but brokered by Russia, Gazprom, and the enigmatic RosUkrEnergo. Ukraine, as a transit country for 80% of Russia’s exports of gas to Western Europe, relies very heavily on these fees for income.

⁸⁴ While *Kommersant’s* original article in October 2006 referred to the details of the negotiations as coming from government sources, it was later confirmed by an official announcement that indeed RosUkrEnergo will continue

officials is an extremely valuable tool, in addition to just plain coercion. In the case of Russian-Ukrainian gas trade, it is only circumstantial evidence, but all the known facts point to bribery being a weapon in the arsenal of Russian energy foreign policy.

Permission to Monopolize the Market

Before continuing with an analysis of the motivations behind the nationalization and monopolization of Gazprom, it is useful to examine the steps that Russian government has taken to solidify the company's position. These actions in themselves make it clear that the Russian government has strategic intent for its mega-corporation, which some analysts have sardonically dubbed "Russia, Inc." and led others to quip that "if the Kremlin had a stock exchange listing, Gazprom would be it."⁸⁵

In July 2006, Putin signed into law legislation passed by the Federation Council and State Duma concerning the right to sell Russian natural gas abroad. The law specifically states that the "exclusive right to the export of natural gas belongs to that organization which owns the unified system of gas supply or its subsidiary company"⁸⁶ The passage of this law gave Gazprom not only a physical monopoly on the export of gas because of its ownership of the UGS, but also a legal sanctioning of that monopoly.

The coup de grace for any chance for a return to liberalization of the gas sector occurred in January 2007, when the Moscow Arbitrage Court ruled that Gazprom may purchase other domestic gas production assets, contrary to an earlier ruling by the Russian Federal Anti-Monopoly Service prohibiting such a move.⁸⁷ This ruling will make possible the return of Russia's natural gas sector to absolute government control under the auspices of Gazprom, which already directly owns 60% of Russian gas reserves. It gives Gazprom free reign to buy out the few remaining natural gas companies that are not government owned, including Novatek, Itera, Nortgaz, and Rospan International.⁸⁸ Gazprom already owns 19.9% of Novatek, Russia's second largest gas producer, in a deal that was brokered in spite of the Anti-Monopoly Service's prior ruling. Gazprom has also taken a controlling interest in several of Itera's subsidiaries.⁸⁹

As one analyst correctly pointed out, this will not actually affect competition within the Russian gas industry since there is no competition; it will simply put more reserves under Gazprom's control and increase their price-setting capabilities abroad.⁹⁰ Because the Russian government

to broker the gas between the two countries. The fact that these two businesses keep around a middleman that siphons off hundreds of millions of dollars per year, when the corporate management on both sides state they are against even having a middleman, strongly indicates that there are statements made for public consumption and then the true reasons for RosUkrEnergo's existence.

⁸⁵ "Russia's Energetic Enigma," Economist.com, October 6, 2005, http://www.economist.com/displaystory.cfm?story_id=4484349.

⁸⁶ Author's translation of "Федеральный закон Российской Федерации от 18 июля 2006 г. N 117-ФЗ об экспорте газа" ["Federal Law of the Russian Federation of 18 July, 2006 on the Export of Gas"], <http://www.rg.ru/2006/07/20/gaz-export-dok.html>.

⁸⁷ "Gazprom Free to Buy Up Russian Gas Producers," *Kommersant*, January 15, 2007, http://www.kommersant.com/p733954/r_500/Gazprom_Gas_Production/.

⁸⁸ Of the estimated 47.5 trillion m³ of Russian proven natural gas reserves, Gazprom controls approximately 29.1 trillion m³. This ruling gives Gazprom free reign to buy out the few remaining natural gas companies that are not government owned, including Novatek, Itera, Nortgaz, and Rospan International. "Russia: Permission for Gazprom to Rule the Energy Sector," Stratfor, http://www.stratfor.com/products/premium/read_article.php?id=282974.

⁸⁹ Ibid.

⁹⁰ "Checkmate – Novatek Deal Strengthens Gazprom's Position in Russia and Beyond," *Global Insight*, <http://>

dictates the terms of domestic sale of gas for independent producers, there is no price competition. By sanction of the July 2006 law, only Gazprom is allowed to sell gas to foreign markets, where prices of \$230 – 250 per thousand m³ are normal rates for long-term contracts. This leaves the independents to sell only to internal Russian markets at greatly reduced prices ranging from \$26-\$49 per thousand m³.⁹¹ As Gazprom owns all the pipelines in Russia, the independents must pay Gazprom transit fees to even market their gas at the vastly reduced internal rates. These two levers of control—pricing and pipelines, plus the aid of governmental ministries and the courts—will make the job of finishing Gazprom’s consolidation of the natural gas industry within Russia easy work.

It remains to be seen if a controlling stake in all the remaining independent gas companies is the ultimate goal of the Russian government, since keeping around some independent producers ultimately will not affect gas exports and leaves room for foreign investment outside of Gazprom. Regardless of the ultimate configuration of gas producers, any roadblocks to such an absolute monopoly have been removed and the government has achieved its desired goal: total control of all aspects of natural gas exports from Russia and the capability to increase Gazprom’s internal portfolio if the need arises.

Sakhalin 2

Nowhere is the deliberate and calculated effort of the Russian government to regain control over its natural gas assets and increase Gazprom’s influence in the gas markets more evident than in the Sakhalin 2 negotiations that transpired in the latter half of 2006. The Sakhalin 2 Energy Project was originally established as a Production Sharing Agreement (PSA) between the Russian government and the Anglo-Dutch consortium Royal Dutch Shell and Japanese minority partners Mitsui and Mitsubishi Corporations. The purpose was to develop the immense oil and gas reserves in the deep ocean waters off the coast of Sakhalin Island just north of Japan. In the 1990’s, the Russian hydrocarbon industries were extremely reliant on foreign investment and technology due to both sustained economic recession and a general inexperience in exploration in more difficult conditions such as deep oceans. Russia therefore gave favorable conditions to these three investors.

The Sakhalin LNG shipments that were slated to begin in late 2007 or 2008 are crucial to Japan, which uses 100% LNG for its natural gas. The terms of the original PSA had the Russian government receiving profits only after the Shell-Japanese venture recouped its investment. Sakhalin 2 is estimated at having reserves of 498 billion m³ of gas⁹² that could fetch over \$100 billion at current prices. As the cost of the venture had doubled by 2006, the Russian government was apparently going to have to wait until considerable revenues were generated from the project before they would receive any monies. At that point, the Russian Ministry of the Environment, *Prirodnadzor*, stepped in and leveled numerous environmental charges against the Sakhalin Energy Investment Corporation (SEIC), basically bringing the project to a halt.

In December 2006, Gazprom, with the help of considerable pressure from these governmental environmental regulators, was able to obtain a 50% plus one share ownership of SEIC for \$7.45

www.globalinsight.com/SDA/SDADetail6239.htm.

⁹¹ Gazprom Corporate Website, “Distribution,” <http://www.gazprom.com/eng/articles/article20159.shtml>. A conversion rate of 26.5 Russian rubles per dollar was applied to the Gazprom-provided figures.

⁹² Energy Information Administration, “Sakhalin Fact Sheet,” http://www.eia.doe.gov/emeu/cabs/Sakhalin/images/sakhalin_0905_wk.html.

billion, significantly below the market value of the controlling portion of the company – minimum estimates had been 11 billion dollars.⁹³ Under the terms of the agreement, Shell, Mitsui, and Mitsubishi all relented and agreed to proportionately dilute their ownership in return for the cash payment, thereby relinquishing controlling share of SEIC to Gazprom. When specifically asked if the Russian government made the environmental allegations to gain control of the project, the Japanese Minister of Trade, Economy, and Industry, Akira Amari, said “I feel that way but I cannot assert it in my position as trade minister.”⁹⁴

Putin’s comment on the signing of the deal was less than sincere and a clear attempt at deflecting any criticism that the Kremlin had orchestrated the whole takeover, “Gazprom decided today to take part in the joint Sakhalin-2 project. This is a corporate decision. The Russian government was informed about it and we have no objections to it, we welcome it.” He added, “the Russian government and investors are interested in the implementation of this project Once again, I want to stress that we will do everything to carry this project through.”⁹⁵ Considering Dmitri Medvedev’s dual-hat role as Deputy Prime Minister and Gazprom Chairman of the Board and the charges leveled by the Russian Ministry of the Interior, Putin was audacious to spin the situation as if it were a business decision, in which the Russian government played no part. In actuality, the takeover was calculated and planned by Putin and his ministers and is in complete accord with Putin’s own 1999 musings on the need to nationalize strategic resources.

Kovykta

History is repeating itself as the Kovykta project is in jeopardy of having its license revoked. This gas field in Eastern Siberia is owned by RUSIA Petroleum, the TKN-BP consortium of British Petroleum in conjunction with Interros, a large Russian holding company, and the Irkutsk Regional Government.⁹⁶ In this instance, the challenging agent of the government is *Rosnedra*, the Russian Federal Agency for Subsoil Use. The original PSA for the development of the Kovykta fields called for 9 billion m³ per year to be supplied to the Irkutsk Region by 2006.⁹⁷ The agreement was written a decade ago, when gas demands for the region were envisioned to be much higher. For several reasons, the project is producing far less than the amount stipulated in the licensing agreement granted to RUSIA Petroleum. These reasons are directly attributable to deliberate actions of the Russian government. Demand is low because much of the region still does not have distribution to households, part of the Russian ‘gasification’ project. While the Kovykta project could produce much more gas, Gazprom controls all exports and has blocked any such sales.⁹⁸ Therefore, the gas must be sold domestically, leaving the consortium with the unlikely option to sell its gas on local markets at rates that are far below market prices or literally burn it off in order to meet the quota.

⁹³ Faced with the prospect of losing their entire investment because of the stalemate over environmental issues, SEIC was basically forced to sell at less than market value. “Gazprom Secures Half of Sakhalin-2 for 7.45 Billion Dollars,” AFP Business News, December 22, 2006, <http://au.biz.yahoo.com/061221/33/10x70.html>.

⁹⁴ “Japan Urges Russia to be “Responsible” After Gas Takeover,” AFP Business News, December 22, 2006, <http://au.biz.yahoo.com/061222/33/10yr8.html>.

⁹⁵ “Radio Free Europe/Radio Liberty Newslines,” December 22, 2006.

⁹⁶ “Росприроднадзор начал проверку Ковыктинского месторождения по сценарию Сахалина-2,” New.RU.com, January 18, 2007, <http://www.newsru.com/finance/18jan2007/prirodnadzor.html>.

⁹⁷ “TNK-BP Unable to Eliminate License Violations,” *Kommersant*, March 6, 2007, http://www.kommersant.com/p-10254/r_529/kovykta_license/.

⁹⁸ “Росприроднадзор начал проверку Ковыктинского месторождения по сценарию Сахалина-2,” New.RU.com, January 18, 2007, <http://www.newsru.com/finance/18jan2007/prirodnadzor.html>.

In a clear sign that the highest levels of the Russian government are pulling all the strings in this latest transaction, the head of *Rosnedra*, Anatoly Ledovskikh, stated that the original terms of the agreement could not be amended with the current owners, but at the same time he implied that the government would amend the terms with a new owner and not be in violation of the law.⁹⁹ In the same interview, he dodged the question of why new terms simply could not be arranged with the current owners.

Since the start of the Sakhalin 2 environmental issues, it became apparent to the Kovykta owners that they were going to be eventually muscled out by the very government and policies that prohibit them from profitably selling the gas. In an attempt to preserve its investment to date, the consortium owners have been in talks with Gazprom since December 2006; it is almost certain that some sort of arrangement that cedes 50% ownership will be struck. *Rosnedra* has given *RUSIA Petroleum* until May 2007 to be in compliance with the volume of production terms. As the Kovykta field is rated at 1.9 trillion m³ of reserves and is considered by many to be the critical asset for future deliveries to the Chinese market,¹⁰⁰ a deal amenable to the Russian government, which at the same time preserves some perspective of profitability for foreign investors, will likely be signed soon with Gazprom.¹⁰¹ As with Sakhalin 2 and the Yukos affair in 2003, the Russian government will almost certainly orchestrate the required moves to re-obtain these highly desired resources.

Gazprom's Distribution Portfolio and the Energy Charter

The methodical steps the Russian government has overtly and unabashedly taken to regain total control of the gas sector should be fairly apparent and convincing to the reader. The question remains, to what end? The absolute monopolization of the gas industry is clearly not in the best interest of the consumer – even post-Soviet Russian leaders know that monopolies are bad for pricing, which is why a Russian Federation Anti-Monopoly Service was even created. In this instance though, the concern is not the internal market, but rather gaining the ability to manipulate the export market. Numerous Russian gas corporations vying for European customers would obviously be beneficial for the consumer, but a unified Gazprom, staunchly supported by the Russian executive branch, will not only have the ability to set prices based on its monopolistic position, but can do so with the backing of significant political might.

Gazprom's downstream ownership in the gas distribution networks is a critical part of the strategy to dominate the European market. As energy analyst Roman Kupchinsky aptly described Gazprom's distribution acquisitions, "He who controls the pipeline therefore controls the buyer."¹⁰²

¹⁰² Estimates are that Gazprom has spent \$2.6 billion in recent years on Western European gas

⁹⁹ "TNK-BP Unable to Eliminate License Violations," *Kommersant*, March 6, 2007, http://www.kommersant.com/p-10254/r_529/kovykta_license/.

¹⁰⁰ Miriam Elder, "Mitvol Targets the TNK-BP Kovykta License," *The Saint Petersburg Times*, March 2, 2007, http://www.sptimes.ru/index.php?action_id=2&story_id=20850.

¹⁰¹ The latest in this saga was a meeting of British Petroleum and Gazprom's presidents in March 2007. While neither company was forthcoming substantively, it appears that British Petroleum was trying to strike some sort of LNG deal with Gazprom in return for concessions in Kovykta. Alex Nicholson, "BP, Gazprom Discuss LNG Joint Venture," Associated Press, March 1, 2007, <http://www.forbes.com/feeds/ap/2007/03/01/ap3475945.html>. [Supplement: A decision on this deal was to be announced in early 2008, but was not made until now (July 2008). See http://www.jamestown.org/edm/article.php?article_id=2372218, and <http://www.finanznachrichten.de/nachrichten-2007-12/artikel-9612819.asp> (accessed July 14, 2008).]

¹⁰² Roman Kupchinsky, "Russia: Does Gazprom Have a Master Pipeline Plan?" Radio Free Europe, <http://>

distribution assets with the intent of increasing its market power all the way down to the consumer.¹⁰³ As pointed out previously, Gazprom has a minority interest in virtually every European country's gas distribution network. An increasingly apparent Gazprom strategy is attracting investment and technology to permit limited foreign participation in Russian gas fields, but only in return for ownership in distribution, transportation, and refinery assets in Europe.¹⁰⁴

The acquisition of foreign gas infrastructures complements Russia's refusal to ratify the Energy Charter. The European Energy Charter is an extremely vague, 250-page legal document that has numerous interpretations. Article 7 states that a signatory to the charter:

“...shall take the necessary measures to facilitate the Transit of Energy Materials and Products consistent with the principle of freedom of transit and without distinction as to the origin, destination, or ownership of such Energy Materials and Products or discrimination as to pricing on the basis of such distinctions, and without imposing any unreasonable delays, restrictions or charges.”¹⁰⁵

This section has been generally interpreted that (germane to this discussion) pipelines should be open to access by any producer's gas, as long as that access does not interfere with, or preclude the capacity of, the pipeline to transit the owning country's gas.¹⁰⁶ Without even listing Moscow's specific objections to the charter, on the most fundamental level it is apparent that it is not compatible with domestic legislation. Russian law currently does not allow even independent Russian companies to export gas on the UGS, let alone a foreign entity.

President Putin articulated the government's principal objections to the Charter in September 2006, however, and they are worth noting. His primary concern is that letting intermediaries use the pipelines would not lower prices, but allow someone other than Russia to pocket the profits. Second is that such access would have to be an equitable exchange for Russia; its European partners have no energy resources that Russia needs, so what could be gained in return? Putin also tied the Energy Charter to granting Russia access to advanced technologies and nuclear fuels, which are currently restricted by most of the Western partners for sale to Russia.¹⁰⁷

Beyond the official reasons, another motivation is evident: Russia wishes to monopolize the transit of natural gas from Central Asia. As will be discussed, Central Asian gas presents one of the best alternate sources for European consumers. Currently, all that gas transits to Europe via Russia's UGS. Abiding by the spirit of the Energy Charter would open that transit business to an intermediary other than Gazprom. Granted, the intermediary would still have to pay 'reasonable'¹⁰⁸ transit fees for the usage of the network, but the leverage that Russia currently exerts on both Central Asian governments and the consumers of their gas would be lost. For all

www.rferl.org/featuresarticle/2006/01/fd3d68ab-8551-4b4f-8b7d-f8257af7c1ab.html.

¹⁰³ Ibid.

¹⁰⁴ Vladimir Kovalev, “Gazprom's Power Play,” BusinessWeek.com, March 6, 2007, http://www.businessweek.com/print/globalbiz/content/mar2007/gb20070306_599860.htm.

¹⁰⁵ The Energy Charter Treaty, 48. www.energycharter.org.

¹⁰⁶ Igor Tomberg, “Russian – Europe: Serious Difficulties of the Energy Dialogue,” *Strategic Culture Foundation*, November 11, 2006, <http://en.fondsk.ru>.

¹⁰⁷ Igor Tomberg, “Thus Spoke Putin: Russia Upholds Principle of Equality in Energy Sphere,” *The Jamestown Foundation*, September 15, 2006, http://www.jamestown.org/publications_details.php?volume_id=414&issue_id=3856&article_id=2371449.

¹⁰⁸ Based on the most common interpretations of the Energy Charter, which prohibits “unreasonable charges,” Russia would still be able to charge a reasonable—presumably market rate—fee for transit services.

these reasons, it is pointless for the EU to expect Russia to agree to the terms of the Energy Charter. With the 10-year “Partnership and Cooperation Agreement between Russia and the EU” expiring in 2007,¹⁰⁹ barring some unforeseen concession on behalf of the EU, the Energy Charter will be a continuing point of contention within the EU-Russia Energy Dialogue.

Russian Imperial Thinking

Clearly, nationalization of the gas extraction and distribution industries is deliberate and carefully planned. Putin’s academic mentor and doctoral dissertation sponsor, Vladimir Litvinenko, Rector of the St. Petersburg Mining Institute (and a recent addition to the Energy Policy Committee), summed up his protégé’s philosophy on the matter quite succinctly: “In the specific circumstances the world finds itself in today, the most important resources are hydrocarbons. They are the main instrument in our hands – particularly in Putin’s – and our strongest argument in geopolitics.”¹¹⁰ Many Western analysts agree with this assessment, as evidenced by this statement from the *Economist* on Putin’s rationale for establishing a gas export monopoly, “it guarantees the Kremlin’s control over what, with the possible exception of nuclear weapons, has become Russia’s most powerful foreign-policy tool, and its best hope of regaining lost clout.”¹¹¹

Lost clout is most likely the overriding motivation behind these machinations – the re-nationalization of the gas and oil industries with the simultaneous reduction of foreign ownership. Russia lost incredible prestige and power with the dissolution of the Soviet Union in 1991. Whether the Soviet Union stood on the morally right side of the Cold War still seems irrelevant to most Russians; they are still fiercely proud of the superpower status they once held. Many are ambivalent about the nature of the Soviet regime, but not about the prestige that it brought Russia in world affairs. A recent poll indicates that 35% of Russians would even like to see a return to the Soviet system.¹¹² Regaining superpower status seems paramount amongst the Russian political elite.

Putin summed up this way of thinking in his 1999 treatise prior to assuming the presidency:

“Russia was and will remain a great power. It is preconditioned by the inseparable characteristics of its geopolitical, economic, and cultural existence. They determined the mentality of Russians and the policy of the government throughout the history of Russia and they cannot but do so at present.”¹¹³

In a recent roundtable discussion of Russian foreign policy decision makers, this was the underlying theme as expressed by Pavel Ipatov, Governor of the Saratov region, “Our country is

¹⁰⁹ [Supplement: A new agreement is being negotiated; the old agreement will stay in effect until it is replaced by a new one. See http://www.eu2006.fi/news_and_documents/press_releases/vko47/de_DE/175543/, and <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1099&format=HTML&aged=0&language=EN&guiLanguage=en> (accessed July 14, 2008).]

¹¹⁰ Stephen Boykewich, “St. Petersburg Mining Institute Rector Makes Plan for the Creation of Russia, Inc.” *The St. Petersburg Times*, June 20, 2006.

¹¹¹ “Russia’s Energetic Enigma,” *The Economist*, October 6, 2005, http://www.economist.com/business/displayStory.cfm?story_id=4484349.

¹¹² Poll conducted by the EU-Russia Center as quoted in William Pfaff, “Russia’s Deep Animosity,” *International Herald Tribune*, March 5, 2007, <http://www.iht.com/articles/2007/03/05/opinion/edpfaff.php>.

¹¹³ Vladimir Putin, “Russia at the Turn of the Millennium,” <http://www.geocities.com/capitolhill/parliament/3005/poutine.html>.

focused on resolving the problems on which its economic and social progress depend, and restoring its *natural* historical role of great nation.”¹¹⁴ Although it is the author’s emphasis on the word natural, it is important to understand that Russian elites see their country in this very way; because of its unique position as neither West nor East, as well as its history, people, and resources, Russia necessarily must be a great power.

Opinion polls confirm this view; a full 75% of Russians believe that “their country is a Eurasian state with its own path of development,” while only 10 percent think it “part of the West, with a vocation to move closer to Europe and the United States.”¹¹⁵ Particularly alarming is the prevalent popular notion (45% of Russian’s polled) that “the European Union threatens Russia’s financial and economic independence, would impose its foreign culture on Russia, and is a menace to Russia’s political independence.”¹¹⁶ This sentiment is especially troubling in the context of the thesis that there is a calculated effort to exert political leverage over the EU via gas.

In general terms, Russia sees several methods for regaining its lost superpower status and rebuilding the country’s military might. While it is unclear how the revenues from hydrocarbon sales will be distributed, given that 25% of Russian tax revenue comes from Gazprom,¹¹⁷ the company’s profitability will have a large affect of the government’s ability to spend on defense. Although it is unlikely that any near-term Russian administration would commit the folly of totally undermining the economy with military spending as their Soviet predecessors did,¹¹⁸ the recent proclamation that the Russian government will spend \$190 billion between now and 2015 for weapons modernization indicates that rebuilding powerful armed forces is at least a top agenda item.¹¹⁹

It would be too simplistic; however, to state that the Kremlin’s overarching plan is to build a new army based on its oil and gas dollars. Putin expressed his thoughts on the very subject:

“In the present world the might of a country is manifested more in its ability to be the leader in creating and using advanced technologies, ensuring a high level of the people’s well-being, reliably protecting its security and upholding its interests in the international arena, than its military strength.”¹²⁰

In Putin’s vision of a resurgent Russia playing the role of great power, gas and oil money will play a pivotal role in financing not only the military, but also social programs and infrastructure. He also views gas as a key instrument for achieving Russian foreign policy goals, particularly in Europe.

¹¹⁴ Roundtable discussion of Russian policy makers from “Russia’s Priorities,” *International Affairs*, October 2006, East View Publications, Moscow, p. 33.

¹¹⁵ Poll conducted by the EU-Russia Center as quoted in William Pfaff, “Russia’s Deep Animosity,” *International Herald Tribune*, March 5, 2007, <http://www.iht.com/articles/2007/03/05/opinion/edpfaff.php>.

¹¹⁶ Ibid.

¹¹⁷ Chris Skrebowski, “Gazprom Regrets ...,” *Energy Institute*, <http://www.energyinst.org.uk/index.cfm?PageID=1064>.

¹¹⁸ Evidence of the fact that Russian elites have learned this lesson is Putin’s statement that “We had to pay for the excessive focus of the Soviet economy on the development of the raw materials and defense industries, which negatively affected the development of consumer production and services.” Vladimir Putin, “Russia at the Turn of the Millennium,” <http://www.geocities.com/capitolhill/parliament/3005/poutine.html>.

¹¹⁹ “Russia Prepares to Revise Military Doctrine in Response to USA’s Missile Defense Plans,” Pravda.com, March 5, 2007, http://english.pravda.ru/news/russia/05-03-2007/88005-military_doctrine-0.

¹²⁰ Vladimir Putin, “Russia at the Turn of the Millennium,” <http://www.geocities.com/capitolhill/parliament/3005/poutine.html>.

Thus, Russian leadership is purposefully rebuilding a monopoly in the gas sector under the guise of Gazprom. Its intents are multiple; but chief among them is a belief that such strategic resources cannot be left in the hands of businessmen who will not look after the national interest. Simultaneously, the re-nationalization of the hydrocarbon industries creates the ability to amass personal power, avenues for diverting funds for personal wealth, and even the means for controlling foreign officials, which makes it all the more unlikely that foreseeable administrations¹²¹ will relinquish this increased government control without severe provocation. More important to EU and other consumers of Russian energy, these policies are aimed at increasing the Russian state's economic instrument of power and, more specifically, to be able to set prices in regional gas markets and obtain increased political leverage from the control of this hugely important energy source.

Regardless of whether or not Russia will deliberately try to leverage the political decisions of EU leaders over the longer term through the might of its gas (although it appears that is in fact the very outcome planned for by Russian leaders), it would be unwise for the EU to rely upon any one source for over 30% of its energy.¹²² Given the unreliable nature of the source, Europe's politicians may find they are beholden to Russia. Even worse, they could become the key factor in literally and figuratively arming a clearly resurgent Russia. Rather than telling their constituents they may have to ration heat or electricity in winter, it would be much easier to simply turn a blind eye to undesired Russian behavior, or as in the case of Ukraine, succumb to Russian pressure. The security implications of this Russian influence are profound.

Chapter 3 – Counter Arguments

It seems clear that Russia's dominant position in European gas markets presents a serious threat to the political sovereignty of the EU states and, even more so, to the non-EU aligned former Soviet states entirely dependent on Russian gas. However, several arguments that counter this thesis warrant discussion, as they could mitigate the severity of Russia's ability to assert control in Europe via natural gas – its leading 'energy weapon.' Of the counterarguments, four stand out as mitigating scenarios.

China – Not a Desirable Partner

The first scenario has been proposed by Vladimir Milov, President of the Institute of Energy Policy in Russia, the first Russian independent think tank dedicated specifically to energy policy issues. His basic thesis is that China is not the highly desirable business partner in the gas markets that the Kremlin neo-cons¹²³ assume. One key feature of this neo-con vision of the future is a Russia that turns away from its current position, in which 99% of natural gas exports

¹²¹ Given the immense power and popularity of Putin's party, *Unified Russia*, in conjunction with the government's stifling of opposition parties and the press, it seems almost certain that Putin's successor in 2008 will continue with implementing very similar policies.

¹²² As previously cited, estimates are for up to 21% of the EU's energy to come from Russian gas and another 10-11% from Russian oil over the next two decades.

¹²³ Ironically, the current Russian term for the hardliners in the Kremlin is the same as their Washington counterparts in the Bush administration.

go to greater Europe,¹²⁴ leaving Europe with an energy shortage. Instead, Russia will become a major energy supplier to China, creating an alternate to the geopolitical hegemony of the West.¹²⁵

Milov argues, however, that Russia's 'economic breakthrough' in the East is not nearly as likely as Kremlin planners would hope. He points to three problems confronting a major Russian entry into Chinese gas markets.¹²⁶ First is the People's Republic of China's (PRC) desire to retain its own energy independence. In the case of gas, Milov asserts that mid-term demands for electricity can be met with the increased hydroelectric, nuclear, and coal-burning power generation. He also argues that energy negotiations with China always include price disputes, with the PRC willing to pay only about \$40 per 1,000 m³, far below a "break even" price for Russian deliveries from their fields in Kovytka in Eastern Siberia. In negotiations with Russia, the PRC has stated they will use their own coal rather than pay higher prices. Thirdly, Milov points to the geographical problem presented by Russian gas deliveries: the highest demand areas are on China's southeastern coast, which are the greatest distance from Russia's fields. He asserts that China will meet increasing gas needs in its industrial southeast with LNG terminals.¹²⁷

These arguments are well-reasoned and, if true, a failure of Russia to partner with China would diminish Russia's leverage on European gas markets. If it were to not open routes to China, other than its proposed LNG exports to Japan and South Korea from the Sakhalin Island projects and LNG from the Shtokman field to the United States, Russia would be stuck exclusively with pipeline deliveries to Europe. In such a case, 'mutual dependence' would still clearly favor Russia as the supplier, but the overall lessened demand would diminish Russia's ability to set prices.¹²⁸

Milov's points are based on assumptions about which he gives little detail and contingencies that are clearly unpredictable. First, assuming that the PRC's government aspires to maintain its 9% average annual GDP growth rates of the last decade,¹²⁹ it will correspondingly need to increase its energy consumption. Continuing to increase hydroelectric power generation is possible with projects such as the Three Gorges Dam project on the Yangtze River expected to be totally finished in 2013, but dam construction can take an extremely long time¹³⁰ and dams can have radical side effects on the landscape, especially with the diversion of large rivers. Most importantly, China suffers from droughts and floods, with droughts in particular bringing unpredictability in the level of hydroelectric power generation. China may look to gas to level these peaks and valleys in electricity production.

¹²⁴ Russia has started LNG deliveries to the United States in 2005, the first time that less than 100% of all Russian gas exports went to greater Europe.

¹²⁵ Mikhail Dmitriev, "Russia's Energy Key Strategy," *Russia in Global Affairs*, No. 4 Vol. 4, 2006, p. 122-123 and Vladimir Milov, "Neo-Con Plans and the Sober Reality," *Russia in Global Affairs*, No. 4 Vol. 4, 2006, p. 124.

¹²⁶ Vladimir Milov, "Neo-Con Plans and the Sober Reality," *Russia in Global Affairs*, No. 4 Vol. 4, 2006, p. 125-128.

¹²⁷ While Milov does not state where this LNG would come from, presumably it would be from Brunei, Indonesia, Malaysia, and Australia.

¹²⁸ Such a scenario at a macro level looks at Europe as a unified purchaser. Regardless of whether Russia opens pipelines to China, given the current disparate energy policies in greater Europe and the EU, Russia will still be able to exert different levels of pricing pressure on individual European countries, especially those without a gas diversification strategy.

¹²⁹ World Bank Website, "China, Country Partnership Strategy," <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20583507~pagePK:1497618~piPK:217854~theSitePK:318950,00.html>.

¹³⁰ Work on Three Gorges has been going for over 15 years.

Milov points to nuclear power as an alternative source, but the economics of nuclear power may make Russian gas at \$230-250 per 1000 m³ seem attractive. Recalling figures cited earlier, even paying these prices for imported gas, gas-powered electricity production in Western Europe is still slightly less expensive than nuclear power. China may therefore look to diversify its power production with imported gas, which is cheaper and less risky than nuclear power.

China has large coal reserves,¹³¹ but coal power generation has major drawbacks that will most likely prevent coal from becoming an even larger percentage of China's future electric power generation mix. China already depends upon coal for three-quarters of its power generation. Reserves will likely last for several hundred years, but China would have to greatly expand its mining capacity to meet future needs with coal alone. While China is not a signatory to the Kyoto Protocol on CO₂ emission reduction, the real question is to what extent the PRC government is willing to ruin the country's environment for the sake of increased growth.

As critical as any intra-governmental decision would be, the external pressure under which China would presumably find itself from its more environmentally-minded trading partners would be formidable. Rampant pollution created by coal burning stations would affect global emissions levels and would not sit well, particularly with the EU, which has made strong commitments to controlling global warming and likely will not accept such behavior. During the course of the EU's Energy Summit in March 2007, German Chancellor Angela Merkel made it clear that a future agenda item for the G8 would be to bring pressure to bear on the US and China to reduce coal burning in order to cut greenhouse gas emissions.¹³² Chinese attempts to maintain energy growth through coal, at a similar or even higher percentage of the overall energy mix, will meet with a strong reaction. In a worst-cast scenario, China could find trade restrictions and embargoes placed on it if it were to intensify its coal-based energy strategy, especially as more evidence comes in that global warming is a phenomenon well underway.

The suggestion that LNG will be the predominant source of natural gas in southeastern China, where demand will be the highest, seems to have no support other than geography. It makes the bold assumption that China will be able to sign LNG contracts that are more economical than pipeline gas from Russia. As already noted, a percentage of LNG is lost in transit due to vaporization, therefore the closer the supplier, the less gas is lost. Three countries that rely exclusively on LNG are Japan, South Korea, and Taiwan; all are in extremely close proximity to China and therefore all are logical competitors for the same sources of LNG. The United States and India also stand to be big bidders for LNG from the Pacific region.¹³³

Given at least five major customers for Pacific LNG, there is no reason to assume that LNG will be cheaper than Russian pipeline gas. Recent examples of Spain outbidding the United States for long-term contracts indicate how the LNG market has not yet developed enough supply to be a buyer's market.¹³⁴ Also, given that the Sakhalin Island projects are likely to be one of the biggest suppliers of LNG in the Pacific, it does not seem logical that Russia would sell LNG at favorable

¹³¹ Estimates place China's coal reserves at 12.6% of the world's total.

¹³² Paul Ames, "EU Leaders Agree to Cut Greenhouse Gases," Associated Press, March 9, 2007, http://news.yahoo.com/s/ap/20070309/ap_on_re_eu/eu_summit.

¹³³ India, in particular, stands to be a much larger importer of LNG as their energy needs increase. Due to the mountain ranges between India and Central Asian and Russian sources, and the need for transit through Afghanistan and Pakistan, pipeline projects are extremely unlikely, making LNG the only viable source.

¹³⁴ Damien Gaul and Kobi Platt, "Short-term Energy Outlook Supplement: US LNG Imports - The Next Wave," Energy Information Administration, January 2007, http://www.eia.doe.gov/emeu/steo/pub/LNG_Jan2007.pdf.

prices to China when it could meet Chinese demand with pipeline gas from Kovykta and use the Sakhalin LNG to sate other customers such as Japan and the US. Although geography makes an interesting case for LNG being the preferred solution on Chinese markets, when looking at all the factors, Russian pipeline gas will almost certainly be more affordable and attainable.

For all these reasons, the PRC will most likely pursue an energy strategy to diversify from excessive coal use to a mix with a more balanced use of electricity generation from pipeline gas, nuclear, renewable (in the form of hydropower), and perhaps LNG, but without an over-reliance on any one of them. Given all these factors, contrary to Milov's pessimism, there is a high probability that Russia will establish a gas market to China, creating an unfavorable situation for the EU and greater Europe, in which Russia has pipeline markets to both the west and east. Alexander Medvedev, General Director of Gazprom's Gazexport, recently reaffirmed this optimism by stating, "We regard China as not only the most promising export market but also as a partner in building gas transportation projects and in joint marketing of gas."¹³⁵

A New Energy Source

A second scenario is the development of a new energy source that would make other forms obsolete. In the domain of natural gas markets and its use in electric power generation, the only 'magic bullet' on the foreseeable horizon is fusion power. The International Thermonuclear Experimental Reactor (ITER) project will not likely produce a working reactor for 30 years (if the technology even works) and then the process of building reactors based upon the prototype will take at least another decade.¹³⁶ Realistically, fusion power will not provide a commercially available alternate form of electric power generation until 2045-2050. The bottom line is that a yet undeveloped energy source is not something upon which to base planning.

Although Russian analysts themselves express concern that their 'energy holiday' may last only a few more decades, EU energy planners cannot afford to base their decisions on such optimistic visions of the future. Russian neo-conservatives view optimistic new energy source scenarios as the reason to dominate markets now, while prices for hydrocarbons are high. Mikhail Delyagin, of Russia's Institute of Global Studies, proposed an "Energy Doctrine of Russia," in which he outlines a strategy to maximize Russian dominance in energy markets while the opportunity exists.¹³⁷ Although Delyagin's vision can only be described as hyper-conservative and ultra-nationalistic, his strategy is similar to the one the Russian government is apparently pursuing. The critical point to glean from Delyagin, and apparently the current Kremlin perspective, is that the time is now to rebuild Russia's superpower status, as technological advances could render their hydrocarbon treasures significantly less valuable. In this way, the alternate energy source

¹³⁵ Aleksander Medvedev, "Gazexport: Achievements and Prospects," *International Affairs*, Vol. 52, No. 5, 2006, p. 154.

¹³⁶ William Underhill, "The Big Burst: Fusion is Back," *Newsweek: Special Edition – Breaking Out, Where the Energy Boom Will Lead Us*, December 2006, Newsweek Inc., New York, p. 82-83.

¹³⁷ Delyagin calls for the nationalization of the energy sector and a priority to Russian capital, "each cubic meter of natural gas produced in the post-Soviet area by any company with a significant share of foreign capital is a disgrace for Russia, humiliating its national interests and damaging the economic and political sovereignty." Another key element of the strategy is "Gazprom's penetration into the EU countries' distribution networks" and a renunciation of the Energy Charter Treaty. He argues for direct state promotion of Russian private business in foreign countries: "The basic principle of this expansion should be the provision of relatively cheap Russian energy resources in exchange for strategic assets in these countries." Mikhail Delyagin, "Assessing Russia's Energy Doctrine," *Russia in Global Affairs*, No. 4, Vol. 4, 2006, p. 139-144.

thesis argues doubly for Europe's need to diversify from Russian gas; it is a future that cannot be counted upon for a fallback position. More importantly, Russia is already considering it as a contingency and acting now to maximize influence and profits in Europe.

Control of Central Asian Gas Supplies to Europe

Currently, Russia's UGS serves as the main transport route to Western markets for Central Asian natural gas from Turkmenistan, Kazakhstan, and Uzbekistan. A cursory study of the map explains the situation. Existing pipelines allow for transport of landlocked Central Asian gas only to the north through Russia or to the south through Iran. A direct route from Turkmenistan or Kazakhstan across the Caspian Sea floor to Baku, Azerbaijan is possible, allowing the Central Asian states to link their gas fields to European customers without using Russian pipelines. Based on the price of Gazprom's Blue Stream (depicted below connecting Russia's UGS to Turkey by transiting the Black

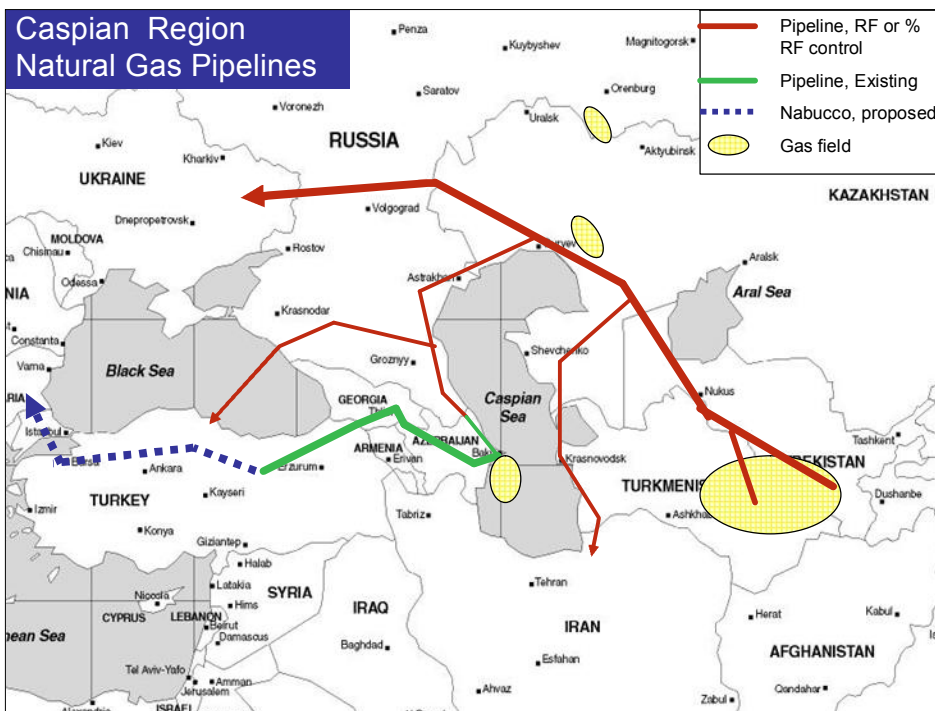


Figure 1: Caspian Region Natural Gas Pipelines (Figure by Author)

Sea floor), a Caspian Sea gas pipeline could be built in the range of \$2-3 billion.¹³⁸ In November 2006, the late President of Turkmenistan, Saparmurat Niyazov, proposed such an idea to the German Foreign Minister Frank-Walter Steinmeier, but also included Russia in the list of possible partners. Until such time as such a project is realized, Russia has the controlling hand in Central Asian gas exports to Europe as the Iran-Turkey route has a capacity of only 10 billion m³/year¹³⁹ and also has the distinct disadvantage of relying on transit through Iran, which at best can be called an uncertain partner.¹⁴⁰

¹³⁸ Author's own estimate based upon the price of the Blue Stream and the shorter distance involved for a Caspian project. The calculation was not simply a factor of price and distance, but also weighing in that Turkish officials were jailed for illegal cost overruns. The Russian portion of the pipeline actually cost far more per kilometer but no corruption charges were leveled at any of Gazprom's officials. Theoretically, a Caspian Sea gas line could be built for far less than the Blue Stream, which cost \$3.4 billion. "Blue Stream Natural Gas Pipeline Russia/Turkey," http://www.offshore-technology.com/projects/blue_stream/.

¹³⁹ Energy Information Administration, "Central Asia: Natural Gas," <http://www.eia.doe.gov/emeu/cabs/Centasia/NaturalGas.html>.

¹⁴⁰ Iran presents a true conundrum for European planners. Iran's huge gas reserves, coupled with its geographic position as a viable alternate route to Europe for Central Asian gas, make it an extremely powerful tool against Russian natural gas dominance. However, due to numerous issues such as the Iran nuclear program, support for terrorism, the apparent arming of the insurgency in Iraq, and the general vitriolic nature of the Iranian administration, it is difficult to argue for a closer partnership with Iran. A wise policy for the EU would be to keep very close

Continuing to control the export of Central Asian gas is critical to Russia if it wishes to maintain its dominant position for pipeline-delivered gas in European markets. The three main Central Asian gas producers annually extract about 140 billion m³, which is about 20% of Russian production.¹⁴¹ Much of this, however, is used for internal energy markets, leaving next exports from Central Asia at only about 50 billion m³/ year.¹⁴² Currently, most of this gas is sold to Ukraine and other Commonwealth of Independent States (CIS) countries at reduced rates through Gazprom-brokered deals. Recent agreements between Gazexport and the Central Asian states, in particular Turkmenistan, could raise the amount of gas for export this year to the range of 60 billion m³ and to as high as 80-90 billion m³ by 2010.¹⁴³ However, the situation concerning Turkmenistan's actual gas reserves is currently unclear. The country had previously accepted reserves of 2.9 trillion m³ but at the November 2006 meeting with German officials, President Niyazov most unexpectedly announced that they had discovered a super-giant gas field at South Iolotansk, with an additional reserve of 7 trillion m³.¹⁴⁴ Gazprom itself has looked skeptically at the size of this claim, as the Turkmen government has exaggerated reserves in the past in attempts to woo partners and it has not released the results of independent audits of the reserve. While it remains to be seen if Turkmenistan can actually produce gas in sufficient quantity to export 70-80 billion m³/year, it is clearly in the best interests of the Russian strategy to control these exports and to profit from their transit fees, as a find of this size would have a great effect on the gas market dynamics from Central Asia to Europe. The key question is whether Russia will be able to maintain a grip on that transit control beyond the next several years.

The answer is difficult to predict, but it is likely that Russia will maintain transit control over a large portion of the Central Asian gas exported to Europe for the next decade or longer. The most obvious reason is that pipelines that provide alternate routes simply do not exist and the most logical route, the Caspian Sea, would take several years to complete. Other export routes have been proposed, such as a line south to Pakistan through Afghanistan or routes from Kazakhstan to China; their main impact would be to lower the overall supply of pipeline gas available for Europe. Such lines could ultimately have a detrimental effect on pricing schemes for European consumers if they gave the Central Asian states more leverage on their price demands to Russia. In much the same way that Russia opening pipelines to China would leverage European consumers, southern routes from Central Asia would almost certainly give them greater ability to demand higher prices for their gas transiting through Russia to the West. Especially if Russian production were to experience lulls (see next scenario), Central Asian gas could be an invaluable resource for Russia to meet its commitments to European customers under long-term contracts.

The relationship between Gazprom and the Central Asian gas states will also depend on how

watch on the Iranian-Russian relationship. While not desirable, the EU might have to form a closer relationship with Iran simply to prevent collusion by the world's number one and two in terms of gas reserves.

¹⁴¹ Ibid.

¹⁴² Total is based upon a list of contractual agreements signed by Turkmenistan, Uzbekistan, and Kazakhstan, with Gazexport in 2006 totaling 56 billion m³. Given the extremely complex and murky nature of gas transfers through Gazprom to Ukraine from Central Asian sources, it is impossible to verify if this amount was actually delivered from exclusively Central Asian sources. Jonathan Stern, "The Russian-Ukrainian gas crisis of January 2006," The Oxford Institute for Energy Studies, January 16, 2006, p. 9.

¹⁴³ Ibid, and Aleksander Medvedev, "Gazexport: Achievements and Prospects," *International Affairs*, Vol. 52, No. 5, 2006, p. 148.

¹⁴⁴ Radio Free Europe/Radio Liberty Newslines, "Turkmenistan: Potential 'Super-Giant' Emerges on Energy Scene," November 10, 2006, <http://www.rferl.org/featuresarticle/2006/11/CB06DCDE-C0D7-40C7-B0E9-8AC1BD48F6F2.html>.

favorably the deals are brokered. As noted, most Turkmen gas is currently being sold to the Ukraine.¹⁴⁵ While the prices Ukraine pays have been constantly going up over the past year, they are still less than half what Gazprom charges its non-CIS customers. But as prices for Ukraine and other CIS countries continue their seemingly inevitable rise toward market gas prices, this presumably would allow Gazprom to meet the demands for higher prices from its Central Asian partners while still maintaining a healthy profit margin on the transit. Therefore, the process of CIS states moving toward world prices for gas also should assist Russia in maintaining its control over Central Asian exports.

Another factor that cannot be overlooked is that Russia, as the successor to the Soviet Union, continues a special relationship with the Central Asian states, which manifests itself in a variety of ways, ranging from security partnerships, weapons sales, business deals, and a large Russian Diaspora, especially in the major cities. This special relationship also argues for the likelihood of a strong continuing control of Central Asian gas via Russian routes, especially since the Central Asian states would have to be prepared to accept backlash if they brokered deals outside of the Russian partnership.

Russia will not Produce

A fourth scenario that would mitigate Russia's influence on European gas markets is the prediction that Russia will be incapable of extracting enough gas to supply European markets, let alone Asian and even global demand. Of all four arguments, this is the hardest to evaluate as it is based on numerous complex variables. The most critical variables in such a scenario are the depletion rates of Russia's mainstay supergiant fields and the ability to develop new supergiants. Approximately 90% of all of Russia's gas production from both Gazprom and the independents is from Western Siberia, in particular from the Urengoy, Yamburg, Medvezhye, and Zapolyarnoe fields.¹⁴⁶ Many of the Western Siberian fields have been under extraction for 20-30 years; sample production forecasts predict a dramatic reduction in their output to less than half of current levels occurring between 2010 and 2015.¹⁴⁷ Of the four above-listed major producing fields, the first three are already in decline. The opening of the Zapolyarnoe in 2000-2001 masked the fact that the three mainstay majors were past their peak.¹⁴⁸ Since these supergiant fields are connected to the UGS and therefore transmission to Western Europe by Russia's largest gas pipelines, their location in central Russia and already existing infrastructure make them Russia's cheapest source of natural gas for European customers.

¹⁴⁵ It should be added as a point of clarification that only the amount of gas provided by Turkmenistan is sold to Ukraine, not their particular gas, as once the gas hits Russia's UGS it just becomes part of the overall volume. *[Supplement: November 2007: Russia agreed to pay Turkmenistan more for gas, this led to higher prices for Ukraine and helps Turkmenistan to speed up the construction of a pipeline to Russia. <http://news.bbc.co.uk/2/hi/europe/7116218.stm>. January 2008: Turkmenistan signs contract with China. http://www.jamestown.org/edm/article.php?article_id=2372730. July 2008: Turkmenistan, Kazakhstan and Uzbekistan announced their intention to switch to European gas prices in 2009. http://www.redorbit.com/news/business/1475499/turkmenistan_kazakhstan_hold_talks_on_turkmen_gas_exports/index.html#. All links accessed July 14, 2008.]*

¹⁴⁶ Gazprom Corporate Website, "Development Strategy," <http://www.gazprom.com/eng/articles/article8523.shtml> and EIA Website Map "Selected Oil and Gas Pipeline Infrastructure in the Former Soviet Union," http://www.eia.doe.gov/cabs/Russia/images/fsu_energymap.pdf.

¹⁴⁷ East European Gas Analysis Website, "Russian Gas Insight 2006-1," http://www.eegas.com/images/2006-1/RGI_2006-1_Overview.pps.

¹⁴⁸ Jonathan Stern, "The Future of Russian Gas and Gazprom," *Oxford Energy Forum*, November 2005, p. 12.

Gazprom believes it can maintain its level of output (547 billion m³/year in 2007) or increase it by an additional 10-15 billion m³/year by developing the satellite fields of these giants in Western Siberia.¹⁴⁹ To maintain or increase upon current production beyond 2010, Gazprom and the independent producers will need to have started production from new giant fields. The most likely prospects are the Shtokman field in the Barents Sea northeast of Murmansk, estimated at 3.7 trillion m³, the Yamal Peninsula fields estimated at 10.4 trillion m³ (which Gazprom labels its key strategic asset), the Sakhalin Island projects in the Sea of Okhotsk, estimated at 2.7 trillion m³, and other fields in Eastern Siberia, and Ob and Taz bays.¹⁵⁰ The first three of the above projects could eventually produce about 250 billion m³ per year, which would satiate nearly the high end of EU Russian gas consumption estimates for 2020-2030.

The problem will not be whether Russia has the natural resources to actually develop, but rather if sufficient investment, both financially and technically, will be made now to develop these fields in time to offset depletion in Western Siberia. Each of these projects presents significant challenges and will require huge investment to develop. All the major new fields are in far more remote places than the Western Siberian fields and require drilling in hundreds of meters of sea in exceptionally cold climates.

In a surprise announcement in October 2006, Gazprom stated it will develop the Shtokman field on its own. The company had been contemplating allowing up to 49% external equity, but failed to find any offers it felt were acceptable. This is at least the official reason, but more likely the decision is just in line with the government's program to systematically remove substantial foreign investment from the industry. Recalling Gazprom's December 2006 buyout of 50% of the Sakhalin 2 project, Gazprom owes \$7.45 billion to its Shell-Japanese partners. The Shtokman field investment is estimated at \$13 billion¹⁵¹ and the Yamal fields will cost \$20-25 billion¹⁵² to fully develop. Shtokman and Yamal also require substantial new pipelines to connect them to the UGS. While only a rough estimate, the development of these three "strategic fields" will cost Gazprom well over \$40 billion to develop.¹⁵³

Concurrent with these new field development projects, Gazprom has to invest heavily in its existing infrastructure. More than 20% of the UGS high-pressure lines are past their expected lifespan of 30 years and the majority of the overall system is over 20 years old.¹⁵⁴ In addition to these refurbishment projects, Gazprom has numerous new pipeline projects underway or in preparation. These include the Nord Stream to Germany, the Altai Pipeline to China, and the necessary extensions to deliver Shtokman and Yamal gas to the existing UGS infrastructure. Gazprom also has plans to diversify into worldwide LNG markets over the next decade, in particular the US, Japanese, and South Korean markets. LNG terminals are planned for both the Russian far east in concert with upgrades to the various Sakhalin Island projects and in the

¹⁴⁹ Gazprom Corporate Website, "Business Strategy," <http://www.gazprom.com/eng/articles/article8523.shtml>.

¹⁵⁰ Gazprom Corporate Website: "Business Strategy," <http://www.gazprom.com/eng/articles/article8523.shtml> and "Major Projects," <http://www.gazprom.ru/eng/articles/article21712.shtml>, and Energy Information Administration, "Sakhalin Island," <http://www.eia.doe.gov/emeu/cabs/Sakhalin/Full.html>.

¹⁵¹ Gazprom Corporate Website, "Annual Report 2005," http://www.gazprom.com/documents/Annual_Report_Eng_2005.pdf, p. 58.

¹⁵² Jonathan Stern, "The Future of Russian Gas and Gazprom," *Oxford Energy Forum*, November 2005, p. 12.

¹⁵³ Development of all these fields presents Gazprom not only with financial challenges, but technological ones, as well. Many industry analysts think that Russia will need to invite at least some foreign participation to ensure that the most modern drilling technology is used to access gas in these challenging ocean environments.

¹⁵⁴ Ibid.

northwest with the Shtokman project. Sakhalin LNG would allow penetration into the Japanese and South Korean markets and a Shtokman LNG terminal on the Barents Sea would provide relatively close access to the US east coast via the North Atlantic. These pipeline and LNG projects will cost Gazprom a rough estimate of another \$20-25 billion.

Gazprom's immediate capital needs do not end there. The company has a huge exploration plan to find and eventually develop new reserves. The Russian government's Program for the Development of the Mineral Resource Base of the Gas Industry, headed by Gazprom, has targets of expanding the proven reserves by an additional 23.5 trillion m³ by 2030.¹⁵⁵ Exploration of this magnitude will cost tens of billions of dollars.

As pointed out in the first chapter's section concerning a Gazprom 'neo-cartel,' the company has a voracious appetite for expanding its portfolio with foreign gas extraction and distribution investments. The company's business strategy highlights this as one of its four core principles for building its "global presence."¹⁵⁶ Another wild card in Gazprom's investment requirements is its project of 'gasification' for the Russian consumer. Gazprom is currently undertaking a three-year plan to add an additional 12,000 kilometers of distribution gas lines to raise the overall level of domestic gas utilization to 60%.¹⁵⁷ This program will cost several billion dollars and will clearly be fully funded as it receives ample press and television coverage as a sign of what the administration is doing for the common people.

Given all these requirements for capital investment, it is impossible to offer a precise figure for the financing required for Gazprom to meet its immediate business plans, however it is not unreasonable to expect that it will require in excess of \$100 billion in the next five years alone if it is to meet the target production levels in the company's published strategy. Future financing for Gazprom's operations is impossible to predict, with far too many unknown variables involved, but despite the pessimism of some analysts,¹⁵⁸ clearly a large amount of this investment can be covered by Gazprom's huge profits. Additionally, Gazprom's portfolio of assets means it will be able to obtain capital in the debt markets, even though the company has a sizeable long-term debt structure already – approximately \$22 billion.¹⁵⁹ Sizeable additional private equity offerings are unlikely without some rather convoluted schemes as the Russian government wants to maintain its majority ownership of the company. While the hydrocarbon industry can be extremely profitable,¹⁶⁰ recent moves by the Russian government to negate formerly honored business agreements, the vagaries of protection for business ventures under Russian law, and the company's oversight by the Russian government (which often uses the company to advance its own social agendas that are not necessarily profitable), all add up to an environment that is becoming less and less attractive for foreign investment despite the promise of huge profits.

¹⁵⁵ Gazprom Corporate Website, "Gas Resources," <http://www.gazprom.com/eng/articles/article20150.shtml>.

¹⁵⁶ Gazprom Corporate Website, "Business Strategy," <http://www.gazprom.com/eng/articles/article8523.shtml>.

¹⁵⁷ Gazprom Corporate Website, "Distribution," <http://www.gazprom.com/eng/articles/article21059.shtml>.

¹⁵⁸ A primary example is a report published by the Institute of Energy Policy in Moscow as cited in "Russia's Natural Gas in Trouble," *Energy Tribune*, <http://www.energytribune.com/articles.cfm?aid=307>.

¹⁵⁹ Gazprom's long-term debt stood at 563 billion Russian rubles as of 30 September 2006, at the exchange rates as of this writing, this equals approximately \$22 billion. "OAO Gazprom Consolidated Interim Condensed Financial Information, September 30, 2006," p. 18-19.

¹⁶⁰ Exxon Mobile was the world's most profitable company in 2005 with a record \$36 billion in profit; Royal Dutch Shell was second, "Fortune Global 500," <http://money.cnn.com/magazines/fortune/global500/2006/snapshots/979.html>.

Another unknown is funding from the Russian government itself, which is now sitting on a foreign currency reserve of \$299 billion as of December 2006. Of this, the Russian oil stabilization fund is now at \$88 billion.¹⁶¹ Since the current administration views gas as one of its chief foreign policy tools, it is likely that Gazprom's venture capital could come from the government itself, especially since such investment would increase the percentage of the Russian government's equity. Based on these many factors, it is impossible to predict whether current investment will be sufficient to allow Russia to continuously increase production over the next several decades, but the fact that the government itself provides a fallback position would seem to lessen the likelihood of catastrophic failure to invest adequately.

While investment is the key variable that will affect future production, and therefore gas available for export to European markets, there are other factors to consider. The majority of Russian gas produced is used for domestic consumption. Russian usage of gas for power generation, industry, and domestic heating is incredibly inefficient and wasteful by any Western standard.¹⁶² The prime reason is the lack of market prices throughout Russia. Gas is sold domestically at prices 4-5 times less than what EU countries pay. Since gas is so heavily subsidized, there is virtually no incentive for industry to become more efficient or for the consumer to economize or even increase the insulation of his or her home. Both Gazprom and the independent gas producers have been clamoring for increases to prices on the domestic markets.

The Russian government will likely allow for more liberalization of domestic prices, especially for industrial use, in the coming years. The government's current "Energy Strategy of Russia for the Period Up to 2020," published in May 2003, calls for price increases and investment in greater efficiency in industrial and domestic use.¹⁶³ A logical outcome of such policies would be a decrease in gas as a percentage of domestic consumption, freeing a larger ratio of the total output for export. Increased efficiency in Russian gas consumption would be a major offset, considering that of the total 598 billion m³ produced in 2005 by Gazprom and the independents, 405 billion m³ were used domestically.¹⁶⁴ This consumption rate is absolutely astounding, placing Russia by far in first place in the world for per capita consumption of natural gas.¹⁶⁵ Accordingly, even reasonably achievable 10-15% increases in the levels of efficiency and conservation could free up 40-60 billion m³ per year for sales abroad. Making a prediction about how much internal consumption Russia can reduce through efficiency is made far more difficult by the on-going 'gasification' project, which will bring more consumers into the equation at the same time as price liberalization is occurring, with its resultant market incentives to economize.

¹⁶¹ "Russian Oil Fund Surges to \$88.4 Billion," Alexander's Oil and Gas Connections, <http://www.gasandoil.com/goc/news/ntr70531.htm>.
[*Supplement: July 2008: \$ 574 billion (Source Wikipedia); 1st Quarter 2008: \$157 billion (Source Wikipedia); accessed July 14, 2008.*]

¹⁶² This is a summary of the Russian government's own assessment of the country's wasteful energy usage as stated in "The Summary of the Energy Strategy of Russia for the Period Up to 2020," Ministry of Energy of the Russian Federation, http://ec.europa.eu/energy/russia/events/doc/2003_strategy_2020_en.pdf.

¹⁶³ While it calls for the more economical use of gas than market prices would bring, it is unlikely that the Russian government will bring domestic prices to world levels in the next 5-10 years. Ibid.

¹⁶⁴ *BP Statistical Review of World Energy 2006: Natural Gas*, p. 27, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2006/STAGING/local_assets/downloads/pdf/natural_gas_section_2006.pdf.

¹⁶⁵ The only country in the world that uses more total natural gas than Russia is the United States, with a population more than double that of Russia. Russia consumes 2.8 thousand m³/year per person; the US consumes 2.1 thousand m³/year per person.

These two phenomena may offset each other, offering no additional supplies available for export, but given the extreme inefficiency in so many areas in Russian gas utilization, the net result of a move to domestic prices reflecting world rates should be vast savings of gas.

Last of the hypothetical situations within this “Russia will not Produce” general scenario is the possibility that Russia would intentionally under-produce. The primary rationale for such action would be similar to the production quotas that OPEC tries to enforce. Keeping supplies intentionally low with a captive European customer would theoretically inflate gas prices on the European markets to higher than world levels. Such a strategy would hinge upon Europe being unable to acquire sufficient offsets from LNG or other pipeline sources, such as Iran and North Africa. European efforts to diversify sources of gas would be the logical way to undermine such a strategy and will be discussed in detail later.

Russia’s future gas production levels and export capabilities are impossible to plan on with any certainty. Broad scenarios ranging from the amounts of near and mid-term investment, internal policies concerning subsidies and efficiencies, increasing the domestic consumer base, or even a conscious effort to limit production, all make forecasting almost pure speculation. However, to sum up this fourth larger counterargument to Russia’s ability to dominate European gas markets, profit is probably the strongest motive working among all these many factors. Even with the recent worsening treatment of foreign investors, as long as some semblance of market factors prevails, there will be incentive to invest and for Russia to internally reform the consumption side of the sector. That would indicate that there should be sufficient impetus for Russia to maximize its ability to export to Europe. In this regard, the most important near-term variables to watch in order to gauge Russian future production capacity are: (1.) the sentiment toward foreign investment, (2.) Gazprom’s ability to raise capital on debt markets, or (3.) the Russian government’s own level of financial assistance.

Any of the first three scenarios would have a beneficial impact on European markets and reduce the power of Russia’s gas lever. The fourth, however, still makes a strong point in favor of the general thesis of this article. If Russia is unexpectedly or deliberately be unable to produce gas in the quantities necessary for European power consumption, it could leave Europe in a power shortage for which there would be no quick solutions. In scenarios one (China) and three (Central Asia), the EU-Russian, consumer-supplier mutual dependence relationship would remain similar to its current status. In the second scenario, gas becomes virtually irrelevant with the advent of the new technology; however, hedging against such a scenario has given Russia the impetus to maximize its gas potential now. The fourth scenario, while mitigating the case for Russian gas dominance, simultaneously makes a strong case for why European gas customers should do as much as possible to diversify to other sources of gas and means of power generation; if Russian future gas export capacity is so unpredictable, relying on it to provide one-fifth of the total energy mix is dangerously poor planning and an exceptional way to hand over part of Europe’s sovereignty.

Chapter 4 – Recommendations

Undoubtedly, the EU (and greater Europe for that matter) can and must take specific actions to counter Russia’s attempts to control the European gas market. A multi-pronged approach for doing so would include: (1.) Diversification of gas imports from new providers through

pipelines, (2.) Diversification of sources through LNG, (3.) Diversification of electricity sources into entirely different means of power generation, and (4.) Investment outside the EU in power generation. Efficiency and economization also provide a fifth exceptional means to reduce energy dependence. The EU strategy envisioned in its Green Paper, entitled “Doing More With Less,”¹⁶⁶ has identified a sensible and comprehensive strategy to conserve valuable energy resources. Due to this, no comments or recommendations for improvement are made for this aspect of the EU Energy Strategy.

Diversification of Gas Imports – Pipelines

The Nord Stream as an Example of the EU’s Lack of Solidarity

In 2005, Gazprom announced that it was going to build a pipeline that would stretch 1,195 kilometers, running along the Baltic Sea floor, connecting UGS pipelines near Vyborg, Russia directly to Greifswald on the northern German coast. The project is a joint venture with the Germany utility company E.ON and the conglomerate BASF. In its usual fashion, Gazprom has a controlling 51% share. The deal was in part brokered by Gerhard Schröder, immediately after his retirement from the post of German Chancellor; he now heads the project’s advisory board. The Nord Stream is expected to go into service in 2010, initially providing 27.5 billion m³ per year and eventually attaining a capacity of 55 billion m³ per year with a second parallel pipe.¹⁶⁷

There are many reasons given for the project: it would provide diversification of routes to supply Western Europe with gas, it would allow a greatly increased total volume of gas as existing pipelines from Russia through Ukraine and Belarus are insufficient to provide expected future demand, and it also would be a direct route for gas from the super giant Shtokman gas field, which lies under the Barents Sea northwest of Murmansk. Internal to Russia, it also provides impetus to link the UGS at Gryazovetz to the Leningrad (St. Petersburg) Oblast, providing more energy for the city’s growing consumption.



Figure 2: Nord Stream projected route, with proposed additional link to UK¹⁶⁸

¹⁶⁶ “Doing More With Less – Green Paper on Energy Efficiency,” European Commission, http://ec.europa.eu/energy/efficiency/doc/2005_06_green_paper_book_en.pdf.

¹⁶⁷ Gazprom Corporate Website, “Nord Stream Gas Pipeline,” <http://www.gazprom.com/eng/articles/article18466.shtml>.

¹⁶⁸ Ibid.

In spite of all these rationales, the overriding concern for Gazprom is to have a route that avoids the transit of Belarus, Ukraine, and to a lesser extent Poland. The first two countries still receive gas at greatly reduced rates (both at approximately \$100 per 1,000 m³ at the time of this writing) and all three reap substantial profit from the transit of Russian gas, in particular Ukraine, as 80% of all Russian gas bound for Western Europe transits through it on the *Druzhba* - Friendship Pipelines.¹⁶⁹ Recalling the previously stated estimate of up to 270 billion m³ of Russian gas being exported annually to the EU by 2030, at 55 billion m³/y, the Nord Stream clearly does not afford Gazprom the capability to totally avoid these transit countries, but it gives the company enormous leverage, as all three countries are dangerously dependent on Russian gas. The Nord Stream would give Gazprom the ability to literally cease the flow of gas to Eastern and Central Europe while continuing to supply its more valued Western European customers for targeted periods of time.

One can easily imagine the coercive power such a capability would give Gazprom to negotiate the terms of gas contracts, or as the surrogate of the Russian government, link shipments to political compliancy. Ukraine and Georgia both provide clear examples of how Russia linked gas prices to political subservience; as both countries started to separate from Moscow's orbit, their gas prices began to dramatically increase. Russia has stated that it is simply finally asserting its right to get market prices from their former Soviet partners, but there has been a clear correlation between level of loyalty, such as Armenia, and the extent to which gas prices have been increased.¹⁷⁰

The cost of the Nord Stream project is estimated at \$5 billion, which is far higher than an analogous land-based pipeline would cost that could parallel existing lines and provide even more volume than this extremely complex project at sea.¹⁷¹ Russia is also expected to encounter some legal fights over the pipeline. It will cross the economic zones of all the countries bordering the Baltic Sea, including a proposed maintenance platform right off the coast of Sweden's Gotland Island. The project has created fishing and environmental concerns. The Baltic Sea, for instance, still has vestigial sea mines from World War II littering its bottom, which raise serious safety concerns as well. Despite all these issues, Russia and Germany decided to bilaterally execute this project without the advice and consent of any of their Baltic neighbors or the EU. The high price tag and the adversity this project will create show clearly

¹⁶⁹ Jonathan Stern, "The Russian-Ukrainian Gas Crisis of January 2006," The Oxford Institute for Energy Studies, January 16, 2006, p. 2.

¹⁷⁰ There is a direct correlation between the level of loyalty to Moscow and gas prices for CIS states. Armenia, almost a vassal of Russia, pays the lowest price. Next are Ukraine and Belarus, who still pay less than half of market rates, but as their orbits have strayed from Moscow, with events such as the Orange Revolution and President Lukashenko's intractability on oil transport terms, they have seen increases of over 200% from former prices. Finally, are the examples of Georgia and Azerbaijan, who—by pursuing Western-oriented policies and partnerships,—have found themselves paying the same amount as EU countries. A detailed analysis of the use of energy as a political tool was done by Robert L. Larson in a report for the Swedish Ministry of Defense, "Russia's Energy Policy: Security Dimensions and Russia's Reliability as an Energy Supplier," Swedish Defense Research Agency, March 2006. In studying over fifty energy cases involving Russia from 1991 forward, he concluded that while Russian had legitimate economic demands in virtually all cases, more than half of them had mainly political underpinnings (page 4).

¹⁷¹ Renovation of the existing Ukrainian pipeline system could increase capacity from the current 115 billion m³/year to 175 billion m³/year, This would provide 5 billion m³/year more than what the Nord Stream hopes to provide by 2105 and be accomplished for far less. Roland Gotz, "The North European Pipeline: Increasing Energy Security or Political Pressure?" *Stiftung Wissenschaft und Politik*, http://www.swp-berlin.org/de/common/get_document.php?asset_id=2439.

what Russia is willing to do to avoid transit countries as well as Germany's apparent apprehension over the need to secure their own direct link to Russian gas fields.¹⁷²

The Nord Stream is a prime example of how far the EU is from having a truly unified energy policy¹⁷³ and indicates how one sovereign state's energy concerns could conceivably undermine the political solidarity of the EU.¹⁷⁴ From the perspective of corporate agreements, it may be too late for E.ON and BASF to back out of the deal,¹⁷⁵ but in future such deals must never be brokered unilaterally by an EU member. One of the most critical strengths the EU can have when negotiating with an energy supplier is its huge position on the consumer side of the supply and demand curve when it speaks as one voice. Fragmentation of the market into individual consumers clearly plays into the hands of Gazprom. A unified EU could (and possibly still can, in the future) negotiate for far better terms with Russia on an almost identical project. A pipeline running through Latvia (with a branch to Estonia), Lithuania, Poland, and on to Germany would cost substantially less than the Nord Stream and could be negotiated with Russia on the terms of a unified EU gas price.¹⁷⁶ Transit fees could then be added on solely within the framework of an EU energy agreement. Presumably terms satisfactory to Gazprom could be reached as well; they would reach a market price paying EU customer, without losing transit fees to non-EU countries. Germany, acting unilaterally, has probably squandered such an opportunity.

Building such an "EU only" pipeline from Russia would only increase the potential volume to be imported from Gazprom. If for some reason the Nord Stream project is terminated, then the EU could consider negotiating from such a position, however it would still be wisest to diversify away from Russian gas rather than simply diversifying the routes of its delivery. An additional pipeline from Russia in lieu of the Nord Stream could only be justified from a route security standpoint. The four aforementioned countries are all NATO as well as EU and therefore such a pipeline could be secured by NATO forces in the event of terrorist activities against energy targets; such a route could provide extra security in the event of the disruption of another route. Rather than using resources to diversify the routes of delivery of Russian gas, as Germany is doing with the Nord Stream, the overall EU objective should be to diversify away from the use of Russian gas. A prudent strategy would be to diversify in such a manner as to keep Russian gas at its current percentage of the overall energy equation, while simultaneously meeting Kyoto emissions targets. It is difficult to state a certain percentage threshold that is unacceptable for one

¹⁷² Chancellor Merkel has not stated publicly whether she supports the Nord Stream project, but the coziness of negotiations that Chancellor Schroeder had with President Putin are gone. In a meeting with Putin on 22 January 2007, Chancellor Merkel made clear to Putin her concerns for EU solidarity and Russia's use of energy as a weapon. While Germany has not back-pedaled on the deal with Gazprom, it is clear that sentiment has changed among some of their politicians. Mark Beunderman, "Merkel Presses Putin to Avoid Further EU Energy Irritation," January 22, 2007, http://www.ezilon.com/information/article_17544.shtml.

¹⁷³ The original variant of the NEP (as it was then known) was originally sanctioned by the EU. That version had the pipeline running through Finland across the Baltic Sea with branches to Sweden and Denmark. The current configuration is certainly not acceptable to Poland or the Baltic nations.

¹⁷⁴ The Polish reaction to the Nord Stream project has been characterized as "frantic" with some justification, seeing the pipeline as yet another in the saga of strategic maneuverings by the great powers to its east and west – Russia and Germany.

¹⁷⁵ [Supplement: *The Nord Stream Project is currently under way, and is expected to be completed in 2011/12. See <http://www.nord-stream.com/en/project/facts-figures.html> (accessed July 14, 2008).*]

¹⁷⁶ Such a pipeline proposal, "The Amber Pipeline," was made in 2004. Russia and Gazprom were not interested. Roland Gotz, "The North European Pipeline: Increasing Energy Security or Political Pressure?" *Stiftung Wissenschaft und Politik*, http://www.swp-berlin.org/de/common/get_document.php?asset_id=2439.

source of energy since political decisions are often formulated on numerous intangible factors, but a good basis to start from is for the EU not to increase the current level of dependence on Russia as it has already shown its negative implications in such examples as Nord Stream and the gas shut off to Ukraine on January 1, 2006.

A Trans Caspian Sea Gas Pipeline

The EU must push for the construction of Trans Caspian Sea pipeline that would ultimately connect to Austria through Azerbaijan, Georgia, Turkey, Bulgaria, Romania, and Hungary via the already proposed Nabucco Pipeline. The Nabucco line should be operational by 2012; ultimately the capacity of such a line could reach 31 billion m³/ year by 2020.¹⁷⁷ The Nabucco will be able to deliver gas from the Western Caspian region via Baku, but will not connect to Trans Caspian fields in Central Asia. The map below highlights the strategic importance of the line but also points out the need for a connection to Central Asian sources via a Trans Caspian route, as the seabed provides the only means of transit that avoids Russia and Iran.



Figure 3: Nabucco projected route – bolded, with possible gas input sources – arrows¹⁷⁸

As stated earlier, a Caspian Sea pipeline could be built for an estimated \$2-3 billion. To open non-Russian routes to Europe for Central Asian gas (especially if Turkmenistan is sitting on a 7 trillion m³ field) would make this investment money extremely well-spent. An additional source

¹⁷⁷ “Nabucco Gas Pipeline Project” <http://www.seerecon.org/infrastructure/sectors/energy/documents/031005gas/Nabucco%20Presentation%20Belgrad%20Oct%202005.pdf> and Corporate Website Nabucco Gas Pipeline International GmbH, “Project Timeline,” <http://www.nabucco-pipeline.com/project/project-timeline/index-kopie.html>.

¹⁷⁸ Corporate Website Nabucco Gas Pipeline International GmbH, “Markets for Nabucco,” <http://www.nabucco-pipeline.com/company/markets-sources-for-nabucco/index-kopie.html>.

of 30 billion m³/year flowing by pipeline into Southeastern Europe from non-Russian sources would have a dramatic effect on both Russia's price setting in the European natural gas markets and on their ability to dictate terms with Central Asian producers. Russia knows this fully well; soon after the Nabucco project was announced, Gazprom proposed to Hungary an extension from its Blue Stream Pipeline, which transits the Black Sea bed to Turkey. In June 2006 Zsolt Hernadi, the chairman of Mol, Hungary's oil and gas company, signed an agreement with Alexei Miller, chairman of Gazprom, to extend the Blue Stream pipeline up through the Balkans to western Hungary. The project, if undertaken, has been estimated at \$6.3 billion and would greatly undercut the validity of the Nabucco project.¹⁷⁹ Concurrent with the Blue Stream extension negotiations, Gazprom and Hungary looked into the possibility of increasing underground gas storage in Hungary. The clear Russian intent of this is to continue to dominate routes into southeast Europe, compete or even obviate the need for the Nabucco, and at the same time diversify transit routes to EU customers avoiding Ukraine.

With 80% of its European gas trade flowing through Ukraine,¹⁸⁰ Russia too has diversification issues to consider. The EU, if it acted with one voice, could likely get concessions from Russia on any objections to the use of the Caspian Sea bed. In return for concessions from EU members on economic zone infringements by the Nord Stream in the Baltic Sea, favorable terms from Russia for a Caspian Sea pipeline could be obtained.¹⁸¹ Hinging the success of one project to the other could give the EU the means to open an alternate route for Central Asian gas, leaving Russia totally out of the equation. Just as Germany acting unilaterally with Russia with the Nord Stream was not in the better interest of greater Europe, Hungary and their Balkan partners coordinating directly with Russia on an extension of the Blue Stream could undermine an excellent opportunity to diversify sources and routes of natural gas.¹⁸²

Andris Piebalgs, EU Energy Commissioner, has stated, "Nabucco promises to be the first great infrastructure project of the new century."¹⁸³ Without political solidarity on the part of EU members and a coordinated foreign policy, it will be nothing more than a promise. Later in the same speech, Piebalgs stated, "A gas infrastructure map of Eurasia is very instructive. Black lines symbolizing gas lines reach down from Russia into the European Union. There are no lines to other major markets."¹⁸⁴ Completion of the Nabucco pipeline and its connection to a Trans Caspian Sea pipeline are vitally critical to changing the current map of Europe's natural gas security.

¹⁷⁹ There is the possibility that Nabucco could still proceed even if Hungary consented to a Blue Stream Extension, but it would depend on Hungary's willingness to partially finance both and the future amount of diversification away from coal in Central Europe. Less reliance on coal burning could create demand sufficient for both pipelines. Judy Dempsey, "Gazprom's Grip on Western Europe Tightens with Pipelines to Hungary," *International Herald Tribune*, June 22, 2006, <http://www.iht.com/articles/2006/06/22/business/gas.php>.

¹⁸⁰ Jonathan Stern, "The Russian-Ukrainian Gas Crisis of 2006," http://www.oxfordenergy.org/pdfs/comment_010_6.pdf.

¹⁸¹ In the simplest terms, the quid pro quo for allowing Russia to build the Nord Stream without objection would be similar terms from Russia on the usage of the Caspian Sea, which as an inland sea does not fall neatly under the terms of International Law. The EU should use this bargaining chip now, as it will no longer exist if it fails to act and simply allows the Russian-German consortium to build without objection.

¹⁸² Hungary is simultaneously a partner country of the Nabucco Pipeline consortium, but its government is giving mixed signals as to whom they will ultimately support. Hungary already relies on Russia for 64% of its natural gas, a decision by Hungary to support Gazprom exclusively would bring the country further under Moscow's influence and could greatly undermine the Nabucco pipeline. See note 180 as well.

¹⁸³ Speech commemorating the agreement to build the pipeline in Vienna on June 26, 2006: Andris Piebalgs, "Nabucco Pipeline – Searching for Alternate Routes for our Gas Supply," <http://europa.eu/rapid/pressReleases>Action.do?reference=SPEECH/06/413&format=PDF&aged=1&language=EN&guiLanguage=en>.

¹⁸⁴ Ibid.

In addition to support for a Trans Caspian Sea and Nabucco pipelines is the need for investment in Azerbaijan's gas producing capability. The Caspian Sea region off Azerbaijan's coast is rated at 1.4 trillion m³ of natural gas.¹⁸⁵ This represents the largest verified reserve of gas near the Eastern European region, which could offset Russian dominance. However, Azerbaijan has been a net importer of gas, as it has a high per capita consumption rate. 2007 stands to be the year in which Azerbaijan becomes a net exporter of natural gas. With proper investment, technology, and sufficient pipeline capacity, estimates are that Azerbaijan could be exporting 20 billion m³/year by 2012; this number could perhaps increase by another 50-100% within a decade.¹⁸⁶ This level of production is far above their current production levels,¹⁸⁷ but given the existing reserves, these figures are achievable with foreign investment. While the potential for gas from Azerbaijan is only about 10 to 20% of the annual exports that Russia can send to Europe, such endeavors will create more competition. Diversification of suppliers and increased available volume can only have a positive effect on prices for the European consumer. In this regard, key elements of a sound EU strategy for energy security involve the investment in the Nabucco Pipeline, a Trans Caspian Pipeline, and the extraction infrastructure in Azerbaijan.

Pipelines from North Africa

There are currently two major pipelines connecting Algerian gas fields to European markets: the Maghreb-Europe Line, which runs across the Strait of Gibraltar to the hub at Cordoba, Spain, and the Trans Med Line, which runs from Algeria, through Tunisia, along the Mediterranean Sea floor to Sicily and on to the rest of Italy. Two other pipelines connecting Algeria to Europe, the Medgaz Pipeline to Spain and the Galsi Pipeline to Sardinia and then to Italy, are expected to be completed in 2009 and 2010 respectively.¹⁸⁸ These four pipelines together will have an annual transport capacity of 51 billion m³, with further expansion capability if demand requires it.¹⁸⁹ In 2005, Algeria exported 65 billion m³ of natural gas to Europe,¹⁹⁰ of which 26 billion m³ were shipped via LNG.¹⁹¹ This new pipeline capacity, combined with Algeria's ongoing LNG expansion, will allow approximately 90 billion m³ of natural gas per year to be delivered to European markets. This is equivalent to 57% of Russia's 2005 exports to the EU.¹⁹² Clearly, even with this on-going expansion, the EU's level of dependency on Algerian gas reaches nowhere near the Russian level. Despite this, Spain, France, and Italy would all be wise to look for LNG shipments from sources other than Algeria, as they all have a much higher percentage of dependency on Algerian gas than the overall EU.

¹⁸⁵ *BP Statistical Review of World Energy 2006: Natural Gas*, p. 22, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2006/STAGING/local_assets/downloads/pdf/natural_gas_section_2006.pdf.

¹⁸⁶ "US Official-Azerbaijan Eyes 20 bcm Gas Exports," <http://www.bakutoday.net/view.php?id=33513>.

¹⁸⁷ [*Supplement: Information on production only available as recent as 2006*, <http://www.eia.doe.gov/cabs/Azerbaijan/NaturalGas.html> (accessed July 14, 2008).]

¹⁸⁸ Medgaz Corporate Website, "FAQs," <http://www.medgaz.com/medgaz/pages/faqs-eng.htm> and Sonatrach Corporate Website, "Galsi, the New Route for Algerian Gas to Italy and Europe," www.sonatrach-dz.com/presentations/session3-2/poti.pdf.

¹⁸⁹ Ibid.

¹⁹⁰ "Algeria Sets a Gas Export Target of 85 bcm by 2010," *Middle East Economic Survey*, www.zawya.com/story.cfm/sidv49n27-1TS04.

¹⁹¹ Energy Information Administration, "LNG Exporters," <http://www.eia.doe.gov/oiaf/analysispaper/global/exporters.html>.

¹⁹² Algeria's 2010-2011 target of 90 billion m³/year equals 57% of Russia's exports to the EO of 156 billion m³.

In all, there will be five major gas pipelines traversing the Mediterranean, linking African fields to Europe by 2009.¹⁹³ With 16% of the current total EU gas import structure coming from Algerian supplies, sufficient pipelines from Africa exist or are under construction. In order to maintain a well-diversified energy strategy, any additional import capacity from North Africa should be met with LNG facilities (see discussion below). This would allow for North African gas to be spread more evenly throughout the EU, while simultaneously bolstering the regional LNG market, which should ultimately be beneficial for price comparisons of long term LNG and pipeline contracts.



Figure 4: Three completed North African Pipelines and Two under Construction¹⁹⁴

Diversification of Gas Imports – LNG

As the LNG market continues to grow worldwide, it will provide significant offsets to pipeline natural gas. It currently accounts for 22% of the gas that is traded internationally, but for the EU 27 it comprises only 11% of total imports, at 47.6 billion m³ in 2005.¹⁹⁵ Of all the EU countries, only Spain relied upon LNG for a majority share of their imported natural gas, at 65% of total

¹⁹³ In addition to these four Algerian pipelines, the Green Stream connection from Libya to Italy via Sicily went to full capacity in 2006, delivering 8 billion m³. “ENI CEO ‘Optimistic’ Italy Will Have Sufficient Gas Supply for Winter,” *International Herald Tribune*, October 17, 2006, http://www.iht.com/articles/ap/2006/10/17/business/EU_FIN_Italy_Gas.php.

¹⁹⁴ Jonathan Stern, “UK Pipeline Gas and LNG Supplies from the UK Middle East, Africa, Caspian, and Russia: Prospects and Consequences,” Power Point Presentation by the Oxford Institute for Energy Studies, London, July 13, 2006, p. 18.

¹⁹⁵ *BP Statistical Review of World Energy 2006: Natural Gas*, p. 22, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2006/STAGING/local_assets/downloads/pdf/natural_gas_section_2006.pdf.

imports. Basic geography, in particular Spain's extreme distance from Russian fields, clearly explains why Spain relies significantly on LNG for its natural gas.¹⁹⁶ LNG provides a large opportunity for the EU to diversify from Russian gas, although it will require considerable infrastructure investment.

There are currently 14 LNG Regasification Terminals in greater Europe with a combined annual output capacity of 89.6 billion m³. While they ran at only slightly over 50% capacity in 2005,¹⁹⁷ nine of the terminals are currently undergoing expansion projects and another six new terminals are being built. When this expansion and construction are completed over the next three years, greater Europe's optimal annual LNG regasification capacity will stand at an impressive 183 billion m³.¹⁹⁸ However, this extra capacity is being added almost exclusively in the United Kingdom, France, Spain, and Italy. The United Kingdom, in particular, is undertaking an enormous LNG infrastructure expansion. Realizing that domestic sources of production are being depleted and the country is predicting to be reliant on imports for 80% of its gas by 2020, they are taking action now to diversify supply to LNG from North Africa and the Middle East.

Conspicuously absent from the roles of European LNG importers are the Baltic Sea littoral states of Germany, Poland, Finland, Estonia, Latvia, and Lithuania and all of the Mediterranean coastline countries of the former Yugoslavia. For obvious reasons, the land-locked countries of Central Europe will have to rely upon littoral states if they are to receive offsets to pipeline gas. Correspondingly, these non-LNG importing countries all rely upon Russian gas for a much higher percentage of their energy mix and could reduce their levels of pipeline gas dependence with the construction of LNG regasification terminals. While there are proposals for LNG terminals (in Wilhelmshaven, Germany;

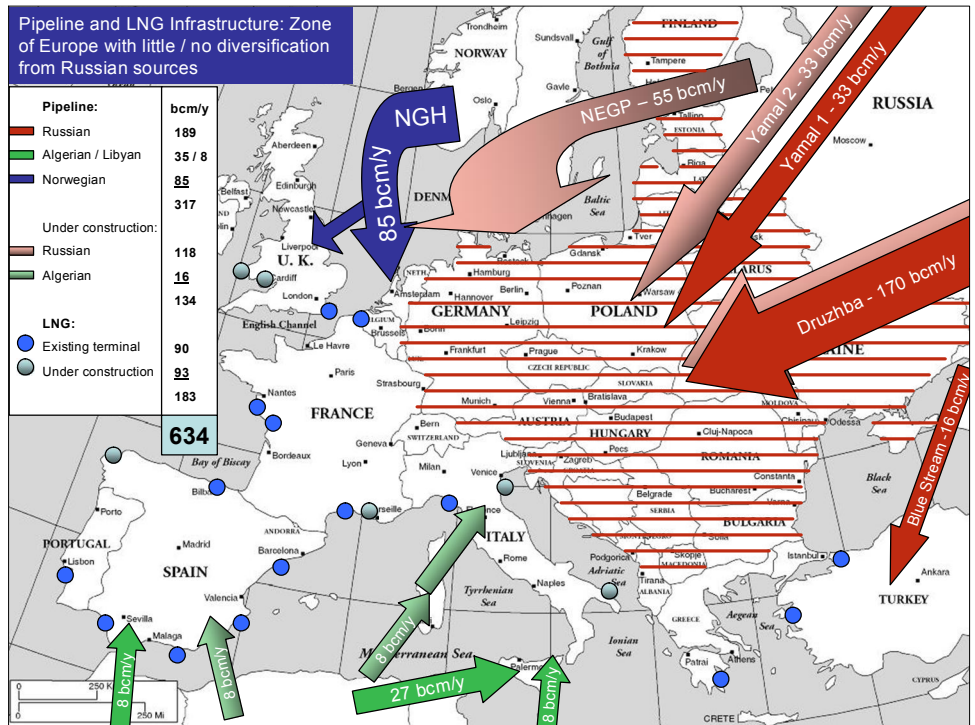


Figure 5: Existing Natural Gas Import Infrastructure and Zone of Europe (red lines) without Significant Capability for Diversification from Russian Gas (Figure by Author)

¹⁹⁶ With only one operational pipeline from Algeria, Spain relies almost exclusively on three suppliers in North Africa (Algeria, Nigeria, and Egypt) and two in the Middle East (Qatar and Oman) for natural gas in the form of LNG.

¹⁹⁷ Figure computed by a survey of all 14 existing terminals and their expansion and the six terminals under construction. Primary source "LNG in Europe: An Overview of European Import Terminals," Law Firm of King and Spalding, http://www.kslaw.com/library/pdf/LNG_in_Europe.pdf.

¹⁹⁸ Figure computed by a survey of all 14 existing terminals and their expansion and the six terminals under construction. Primary source "LNG in Europe: An Overview of European Import Terminals," Law Firm of King and Spalding, http://www.kslaw.com/library/pdf/LNG_in_Europe.pdf.

Gdansk, Poland; Omisalj, Croatia; and Fieri, Albania), none of them are currently underway.¹⁹⁹ This represents perhaps the greatest weakness in the EU and greater European natural gas source diversification strategy; ubiquitous LNG access would rival a Trans Caspian pipeline in level of importance.

Despite the seemingly large figure of 183 billion m³/year of LNG capacity within several years, there are several problems with relying on this capacity. The first issue to consider is the physical fact of nature that pipelines cannot simultaneously flow in two ways. With the preponderance of LNG terminals in Western and Southern Europe, most of this gas cannot be shipped east as it would go against the flow of the lines. While switching direction is theoretically possible, that would shut off the flow from the east, creating an even greater problem, even if it were done only temporarily. The second problem is that European consumption rates are expected to grow while domestic production falters,²⁰⁰ which means as demand is increasing, so will reliance on external sources. While some countries, such as Norway, will be producing natural gas for several decades to come, most European sources will be depleted in the next decade. Based on this, European consumption could easily absorb another 100 billion m³/year annual LNG output by 2020.

Terminals with a capacity of 10 billion m³/year are fairly common and a good planning figure for a recommendation for LNG infrastructure expansion. Europe could easily make use of another 10-12 such facilities at a minimum, and will probably need such an amount if it wishes to keep Russian imports at close to their current levels or at least not increase their total percentage of the energy mix. A comprehensive energy strategy would include the construction of three or four terminals on Germany's coast, the same number for Poland, and one or two in the former Soviet Baltic states. Again, the farther east these terminals are located, the greater the ease with which they can link into existing pipeline networks, which is especially critical if diversification from pipeline gas is to happen for landlocked Central Europe. Similarly, several LNG terminals on the Romanian, Bulgarian, and Ukrainian coastline of the Black Sea would provide LNG that could power Central Europe via the proposed Nabucco Pipeline.

LNG terminal costs throughout Europe have varied widely, from as low as \$300 million to as high as a projected \$800 million, depending on a variety of factors such as existing port facilities and infrastructure to local labor and materials costs. \$600 million as a rough planning figure per terminal is a reasonable average.²⁰¹ Accordingly, for an investment of \$6 billion dollars, EU states could build ten terminals and increase their annual import volume of natural gas through LNG by approximately 100 billion m³/year. Ironically, the Nord Stream from Russia to Germany will cost approximately \$5 billion and ultimately provide 55 billion m³/year. Thus, almost twice the capacity as the Nord Stream could be obtained by terminals at a similar price. What remains to be seen, of course, is the future price of LNG versus pipeline gas. In this regard, Germany may still be making a good investment, but they will not be helping any of their EU neighbors to their

¹⁹⁹ [Supplement: Information current as of April 2008. http://www.energy.ca.gov/lng/worldwide_western_europe.html (accessed July 14, 2008).]

²⁰⁰ The average ratios of proven reserves to production (R/P) for greater Europe is 12.9 years. *BP Statistical Review of World Energy 2006: Natural Gas*, p. 24, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2006/STAGING/local_assets/downloads/pdf/natural_gas_section_2006.pdf.

²⁰¹ A rough average based on the prices of the existing terminals and estimates of the on-going projects as stated in "LNG in Europe: An Overview of European Import Terminals," Law Firm of King and Spalding, http://www.kslaw.com/library/pdf/LNG_in_Europe.pdf.

east. Also, while difficult to predict short-term price action, it is fairly reasonable to assume that, over longer term, LNG will become more of a globally traded commodity, especially being produced in facilities with larger economies of scale, making it more competitive with the price of pipeline gas.

Based on this, the EU states should plan to build at a minimum 10 additional LNG facilities over the next decade. With this increased regasification capacity, the EU could and should plan to increase LNG imports to 100 billion m³/y in the next several years, by 2015 m³/y set a target of 175 billion m³/y, by 2020 225 billion m³/y, and in 2025 275 billion m³/y. Given the rapid expansion in LNG gasification trains and tanker fleets worldwide, such targets would be achievable with the appropriate business arrangements with upstream LNG producing countries. These targets would meet increased energy needs without increasing the aggregate amount of imports from Russia;²⁰² the Russian percentage share of the EU gas market would actually decrease with such a strategy.

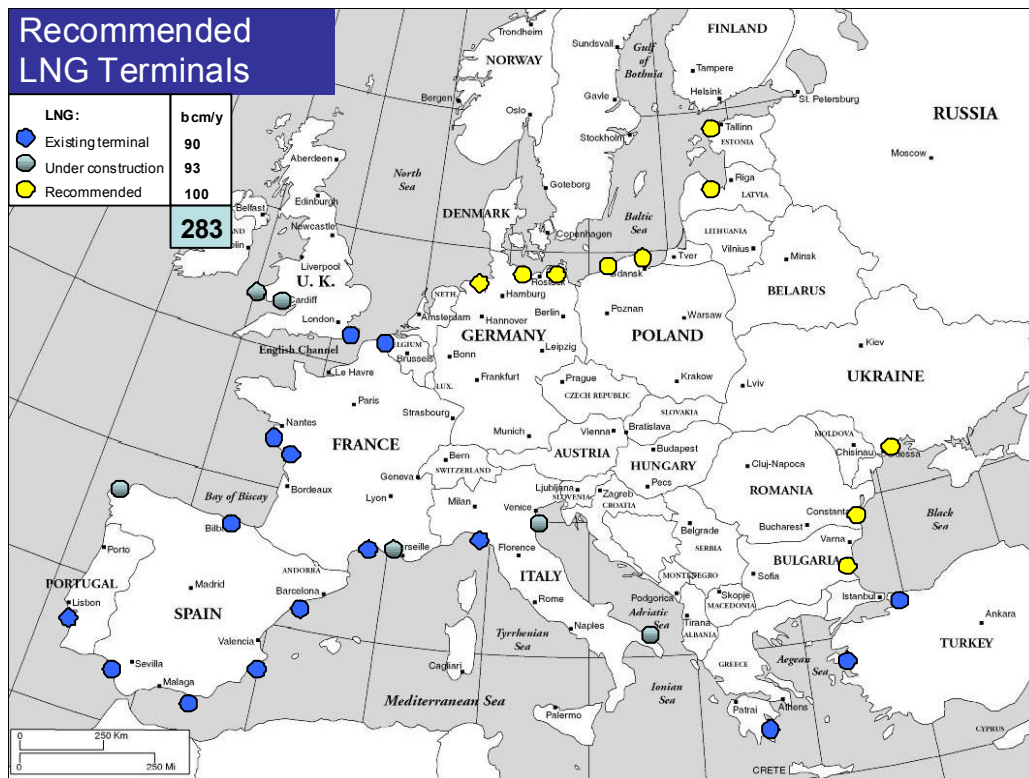


Figure 6: Existing and Recommended European LNG Terminals in 2007 (Figure by Author)

²⁰² These targets would increase LNG imports by 227 billion m³/year over their current levels. Estimates of this increase are derived from several factors. EU 27 consumption in 2005 was 471 billion m³. Using estimates from models predicting the share of gas as a percentage of the EU mix in 2025-2030, the increase from 24% (percentage in 2005) is estimated to be 33-34%. Using the lower of these figures would indicate an aggregate consumption of both domestic and imported gas of 647 billion m³/year. That alone would require an increase of imports by 176 billion m³, but at the same time, domestic fields within the EU 27 will be reaching depletion. EU 27 production was 199 billion m³ in 2005. Domestic production will be far lower in 20 years, especially given that the EU27's R/P is 12.9 years; as a matter of fact, it may be approaching zero. These targets compensate for increased overall consumption, domestic depletion, and also assume that some domestic depletion can be offset with additional pipeline gas from either North Africa or Central Asia.

In concert with an effort to increase LNG capacity in Eastern Europe, individual states must be wary of the further sale of natural gas distribution assets. Gazprom has minority ownership in almost every natural gas distribution company in Central and Eastern Europe. Majority ownership by Gazprom of a distribution network could ultimately give Russia the means to “veto” diversification plans as new LNG terminals would be worthless if the gas from them were not given access.²⁰³

A balanced approach should be taken with upstream producers so that no particular supplier gets more than approximately 20% of the EU’s overall LNG business so as to not create a situation where one supplier has too much of the market. This would require five or six producing states, all capable of delivering 40-50 billion m³ of LNG per year. For European consumers, the most likely sources are (in order): Qatar, Saudi Arabia, the United Arab Emirates, Algeria,²⁰⁴ Nigeria, and—depending on how their relationship with the west develops—Iran. Long-term contracts should be established now allowing additional liquefaction trains to be programmed and built based upon this projected consumption. As discussed earlier, European involvement in the upstream production of LNG will be critical, especially as Gazprom has been eager to get a share in as many of these projects as possible.

Diversification of Types of Energy

Realistically, a total diversification away from natural gas during this century is not possible. Even if revolutionary new energy technologies are discovered, the infrastructure to deliver those energies to industrial and domestic consumers would have to be built. As natural gas is used not only for large-scale electric power generation but also in domestic use, huge infrastructure exists throughout developed parts of the world that allows cooking and heating systems to operate on natural gas, and Europe is no exception. As long as natural gas remains available, there likely will be little economic impetus to build new lines of infrastructure to replace gas in domestic use.²⁰⁵

In addition to the existing infrastructure, making the argument for the continued use of natural gas until it is economically depleted is the fact that natural gas is not in danger of running out any time soon.²⁰⁶ As is the case with oil, ultimately the question of when natural gas will run out

²⁰³ Such a situation would be truly provocative if a Gazprom-owned distribution network lying outside the Russian Federation were to block access to LNG. This would clearly be a violation of the Energy Charter and the EU reaction would likely be severe.

²⁰⁴ Based on the levels of pipeline gas and LNG already being received from Algeria, as previously noted, discretion will be required here, as well, so as to not create another situation where one source represents too much of the energy mix. Factoring in market share growth over the next four to five years, imports from Algerian exports could rise to almost 60% of current imports from Russia.

²⁰⁵ In addition to the smaller gas lines rigging individual homes throughout the developed world, there are over a billion appliances – heaters, dryers, ovens, and stoves – that would have to be replaced if an alternate form of power were to be used. A total switch away from gas would involve hundreds of millions of end users, unlike a conversion to a new means of electric power generation, which affects only the generating station, with the consumer oblivious as to how the flow of electricity was produced.

²⁰⁶ At current ratios of proven reserves to production (R/P) natural gas would last another 65 years.²⁰⁶ This figure is useful only for comparisons because of at least two major but opposing reasons. First, consumption is predicted to rise dramatically globally, not just in Europe, with some estimates placing global consumption at almost twice its current level by 2030. Second, proven reserves will almost certainly dramatically increase. As exploration and extraction technologies improve, the amount of obtainable gas will go up. World proven reserves currently stand at 179 trillion m³ with U.S. Geological Survey estimates of another 119 trillion m³ yet to be discovered. Some of

is pure speculation. With two large unknown variables (future consumption rates and undiscovered reserves)—and only two known factors (current consumption and known reserves), reasonable estimates range from 65 years to almost double that length.²⁰⁷ Regardless, a natural gas crunch will not be a problem until at least two or three generations hence.

Given the assumption that natural gas will be readily available for several generations, some valid decisions still can be made now as to how most wisely use the resource in the longer term and how to diversify away from its use. For Europe, the diversification away from its use should consist broadly of finding alternate means of electric power generation. As was noted in Chapter 1, natural gas has important use in the manufacture of chemicals, pharmaceuticals, and fertilizers; this use should be first in priority for a longer term continued use of gas. For the above-cited infrastructure reasons, domestic use should remain the second priority. Given its characteristic of polluting far less than gasoline and diesel fuel, third priority should be given to natural gas usage in engines, particularly in the public transportation sector, where economies of scale warrant natural gas fueling stations. For Europe, this leaves alternate electric power generation as the primary method for diversification away from natural gas. With a quarter of natural gas used in non-industrial electric power generation, and this percentage increasing every year, even partial diversification could greatly reduce the reliance on imported gas.²⁰⁸

Renewables

At the Spring European Council in Brussels in March 2007, EU heads of state agreed to a commitment to make renewable energy sources such as wind, solar, and geo-thermal 20% of the Union's overall energy mix by 2020.²⁰⁹ The EU currently only obtains 6.5% of its energy from renewable sources²¹⁰ so this goal of increasing its percentage of the mix by 13.5% will be extremely challenging. At the same meeting, targets were set to increase biofuels to 10% of the petroleum and diesel mix and to cut overall greenhouse gas emissions by 20% by 2020.²¹¹ Renewables will be a key part of the strategy to reduce greenhouse gas emissions. Natural gas is also a key player in that strategy for many EU states such as Germany, which plans to go nuclear power free and substitute natural gas for much of its electricity production since gas produces far less emissions than other hydrocarbon sources. Some Eastern European members such as Poland and Czech Republic have stated these goals are unrealistic as renewables are too

this yet to be discovered natural gas will be recoverable and some will remain "stranded" reserves even with future technologies, in areas too remote or deep to make its recovery economically feasible. Energy Information Administration, "International Energy Outlook 2006," http://www.eia.doe.gov/oiaf/ieo/nat_gas.html.

²⁰⁷ Even estimates of over a hundred years may be too short. Scientists are not sure of the processes that occur to produce fossil fuels; there are even still debates as to whether or not hydrocarbons are even produced from organic matter. If they are the by-product of some reactions deeper in the earth's core, then the supply may actually renew itself. Dudley Herschbach, "The Bottomless Well," *Newsweek Special Edition: Breaking Out, Where Will the Energy Boom Lead Us?* December 2006, p. 72-73.

²⁰⁸ Electric power generation (non-industrial) accounts for 24% of the natural gas consumed by the EU. This proportion is expected to rise to 39% of natural gas consumption by 2030. When also factoring in industrial use of natural gas for electric power generation, it accounts for well over a third of its current consumption. Energy Information Administration, "International Energy Outlook 2006," http://www.eia.doe.gov/oiaf/ieo/excel/figure_42data.xls and http://www.naturalgas.org/overview/uses_industry.asp.

²⁰⁹ "EU Sets Target of 20% from Renewables by 2020," RenewableEnergyAccess.com, March 12, 2007, <http://www.renewableenergyaccess.com/rea/news/story?id=47722>.

²¹⁰ Ibid.

²¹¹ Ibid.

expensive for them and they will have to continue to rely upon coal for power generation.²¹² Some options may allow some states to exceed their targets and trade their emissions credits to other countries. The EU's binding commitment to reaching 20% renewables as part of the energy mix is a wise decision that will help to not only reduce emissions, but also stimulate alternatives to gas for power production. In this regard, the EU is on the right track, as only through binding commitments to internal sources of production can they reduce their dependence on external hydrocarbon suppliers.

Those states within the EU committed to meeting or exceeding their targets of 20% renewables and emission reductions must continue to pressure those who would not intend to meet their part of the agreement. The argument that renewable energy is too expensive is valid only when considering a short-term analysis of the cost of power production. There are many intangibles that make this statement far from being certain. It is next to impossible to put a price on a state's sovereignty; the level of dependence that many Eastern European countries already have on Russian gas should convince them that creating alternative sources is invaluable. It is also extremely difficult to put a price tag on the impact of pollution damage created by using hydrocarbons, but the effects are clear, from climate change to individual health.

Renewables also require large investments in the power grid. Each and every wind turbine or solar panel must be linked into the electric grid, which obviously requires far more lines than one massive coal or gas burning electric power station. However, when looking longer-term, once the infrastructure is established and only refurbishment is required, the savings of not having to continuously purchase fuels can be gained. A calculation that renewables are not economically viable in comparison to hydrocarbon energy is also based on the limited knowledge of current fuel prices. As has been pointed out, the easily obtained fossil fuels are being depleted. As in the case of Russia, there are vast remaining reserves of natural gas but they are in extremely hard to explore locations. This fact alone will tend to drive fuel prices up world wide as land-based resources are depleted and more and more drilling has to be done in ocean waters and arctic conditions.

Based on this, the EU's renewable and biofuel commitments will be extremely useful, not only for their stated reasons of saving the environment, but also from the perspective of reducing Russian natural gas dependency. The EU's solidarity to the commitment is crucial and an area to look to promote is investment within the newer EU counties to insure these targets are met. In particular, investment in alternate electric power production in countries such as Poland, the Czech Republic, Romania, Bulgaria, and the Baltic states is a far wiser choice for Western Europe than investing in additional pipelines to Russia. Incentives to stimulate renewable investment should be promoted on the EU's agenda so that all 27 states have a viable chance to meet the targets and reduce dependency.

Nuclear Power

Nuclear power currently accounts for 14% of the EU's overall energy mix. It and coal each produce about one-third of the EU's electric power.²¹³ As some states phase out their nuclear

²¹² Constant Brand, "EU to Make Renewable Energy Targets Binding," CNEWS, March 8, 2007, <http://cnews.canoe.ca/CNEWS/Science/2007/03/08/3715776-ap.html>.

²¹³ "Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy," and Energy Information Administration, "International Energy Outlook 2006," p. 9.

power programs and others diversify away from coal, natural gas becomes the easiest solution in terms of both money and reduced emissions. In this regard, the attitude toward nuclear power is clearly one of the most inconsistent policy areas in the EU. While France whole-heartedly advocates nuclear power, countries such as Germany, Belgium, and Sweden plan to phase it out, with the result that their reliance on natural gas will grow significantly over the next decade.

The true main objection to nuclear power is the issue of dealing with its waste. Reactor safety and plant security are genuine concerns as well, but France's record demonstrates that these issues can be handled with impeccable results. In essence, those EU countries that are phasing out nuclear power in favor of gas power generation are simply trading one security issue for another – fears of waste or proliferation of materials versus losing some aspects of sovereignty to Russia. The chief concern with such a phase-out strategy for nuclear power is that it will be occurring simultaneously with the attempt to increase the percentage of the mix with renewables, which short-term will prove to be more expensive. This will tend to put additional pressure on governments to look for cheap sources of energy to replace nuclear power, since the renewable alternatives mandated by the EU agreement will cost more. It is easy to envision that politicians will look to keep their constituents energy bills as low as possible and Russian gas, at least near term, looks very inviting. This is a dangerous course of action to take and the EU members that are looking to phase out their nuclear power must reconsider it for at least the next several decades while alternatives become more affordable.

For the countries that have concerns about nuclear power plants creating materials useful for nuclear weapons, investing in the technology rather than renouncing it is the way to overcome this obstacle. There is significant evidence that nuclear reactors can be economically run on Thorium, rather than Uranium.²¹⁴ Thorium is naturally more abundant than Uranium and its by-products are not fissionable. Many scientists believe that investment in nuclear power technology can make it even safer - without the proliferation issues.²¹⁵ As nuclear power represents a source of basically emission-free energy, now is not the time for EU states to abandon it. To quote the chief finding of an interdisciplinary study done at The Massachusetts Institute of Technology, "Taking nuclear power off the table as a viable alternative will prevent the global community from achieving long-term gains in the control of carbon dioxide emissions."²¹⁶

"Clean Coal" and other New Technologies

While it is not the intent of this paper to discuss every new technology that is available in the energy sector, there is at least one alternative to increasing imports of natural gas that could greatly assist Europe while longer term transitions to renewable and perhaps fusion energy occurs. Coal is in great abundance throughout Europe and indeed much of the world.²¹⁷ The chief drawback is that coal is the worst emitter of CO₂ of all the hydrocarbons. A comprehensive report published by the Massachusetts Institute of Technology in March 2007 details how it is possible to sequester and store underground the CO₂ produced by coal burning, with currently

²¹⁴ Thomas Graham and Michael Howard, "The Lost Chance," *Newsweek Special Edition - "Breaking Out, Where Will the Energy Boom Lead Us?"*, Newsweek, Inc., New York, December 2006, p. 81.

²¹⁵ "The Future of Nuclear Power - An Interdisciplinary MIT Study," July 23, 2003, <http://web.mit.edu/nuclear/power/>.

²¹⁶ Ibid.

²¹⁷ World coal reserves are currently listed at 1 trillion tons, which at current P/R rates would last the world 180 years. Energy Information Administration, "World Coal Markets," <http://www.eia.doe.gov/oiaf/ieo/coal.html>.

existing technology.²¹⁸ Similar carbon capture and sequester (CCS) technologies can be used in the production of liquid coal, which can power cars at 30% less emissions.²¹⁹ What is needed to make investment in CCS technology a reality is government involvement, legislation that regulates future coal powered plants, and caps on emissions. Given the solidarity, the EU has recently demonstrated on the renewable energy front, it seems quite possible that agreements could be reached for implementing CCS technologies. This would be particularly useful for a diversification strategy for land-locked Central European countries for which LNG does not offer an easy alternative to Russian natural gas. Czech Republic and Poland, with their large reserves of coal, are prime candidates for the introduction of CSS technologies.²²⁰ As coal is the source of 24% of overall world energy and 13% in the EU,²²¹ investing in and ultimately switching to clean coal technologies could provide a significant domestic source of diversification.

Investment in Power Generation outside the EU

Finally, another area where the EU can help itself is in the investment in alternate (non-natural gas) power generation not only within its own borders, but abroad as well. Given the extremely high reliance upon hydrocarbon sources for power generation in virtually all the countries of the former Soviet Union and Eastern Europe (both EU and non-EU), a strategy that goes towards reducing overall regional consumption of natural gas would leave more gas available for export, make resources last longer, and also place negative pressure on prices.

Hydrocarbon usage is a zero-sum game; regardless of where they are used, the net effect is that they are forever exhausted. The former Soviet republics of Georgia, Kyrgyzstan, and Tajikistan all represent areas where there is vast hydroelectric power potential that is vastly under-utilized due to lack of investment.²²² Belarus, Ukraine, Moldova, Turkey, and the Balkans all lag far behind in the development of renewable energy sources. Throughout the states formerly behind the Iron Curtain, the use of natural gas for power generation and industrial applications such as metallurgy is extremely inefficient. Modernization of methods could save up to 35% of the imported hydrocarbon usage in Ukraine.²²³ Further investment in efficiency could conceivably save up to 25 billion m³/year²²⁴ of gas wasted by Ukraine, enough to meet more than the entire annual gas needs of Austria and the Czech Republic.

²¹⁸ While the potential for clean coal technologies appears to be very promising, it will be much more expensive than existing coal power generation. Accordingly, government intervention will be particularly critical to stimulate the technology's usage through legislation that taxes conventional coal usage. "The Future of Coal – An Interdisciplinary MIT Study," March 14, 2007, <http://web.mit.edu/coal/>.

²¹⁹ Emily Flynn Vincent, "The New Coal Car," *Newsweek Special Edition - "Breaking Out: Where Will the Energy Boom Lead Us?"*, Newsweek, Inc., New York, December 2006, p. 68.

²²⁰ Energy Information Administration, "World Estimated Recoverable Coal," <http://www.eia.doe.gov/pub/inter-national/iea2003/table82.xls>.

²²¹ Energy Information Administration, "Coal," www.eia.doe.gov/oiaf/ieo/coal.html.

²²² CIA Factbook, Country Reports on Georgia, Kyrgyzstan, and Tajikistan, <https://www.cia.gov/cia/publications/factbook/>.

²²³ "Energy Efficiency in Ukraine," *European Bank of Reconstruction and Development*, <http://www.ebrd.com/pubs/factsh/themes/eeukr.pdf>.

²²⁴ Investment projects in Ukraine, particularly in the metallurgical industries, where gas is horribly wasted have begun, but there is room for far more improvement and efficiency. 25 billion m³ is 35% of 73 billion m³, Ukraine's total natural gas consumption for 2005, as cited in *BP Statistical Review of World Energy 2006: Natural Gas*, p. 22, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2006/STAGING/local_assets/downloads/pdf/natural_gas_section_2006.pdf.

A phenomenon of globalization is that energy concerns are becoming more and more intertwined. Efforts to conserve in one region have the net effect of increasing supply and lower prices in another. In this regard, there are plenty of opportunities within the Russian-dominated Eurasian natural gas markets for investment in alternate energy usage that will benefit all consumers. The EU should therefore not limit itself to investing in renewables and efficiency within its own borders as investment in its neighbors will reap benefits at home, both economically and ecologically.

Conclusions

This article has argued that the European Union must take decisive action to diversify its future energy needs away from Russian natural gas. Paradoxically, the EU's energy policy is more strategically forward-thinking and global community-minded than that of any major power, while at the same time it is mired in the parochialism of the different views of its member states. Admirably, it is the world's spokesperson for a rational policy that concerns itself with not only global climate change, but also the need for a long-term gradual weaning from hydrocarbons to renewable sources of energy. Unfortunately, the strategy of some member states to meet energy needs over the next 30-40 years, during what will be a likely be a dramatic transition period in the evolution of energy technology, seems to be based on the premise that Russia is not only mutually dependent on its European partners, but also will continue to act in a reliable manner and not exploit its increasing monopoly position, particularly in the natural gas markets. This would be an unwise policy to follow, even if Russia were the most liberal of democracies. Given Russia's uncertain future, and the demonstrated fact that it has been systematically reorganizing the entire Eurasian gas market from production all the way down to local distribution under its state-controlled agent, Gazprom, it is totally unrealistic to expect benign treatment from such a monopoly.

The EU's current energy strategy has many worthy points that particularly the United States, China, and India should heed. While the strategy admits that it is overly dependent on Russia as a source of its energy, it offers virtually no definitive answers about how to reduce that dependency. Of course it will require political will, but this paper has demonstrated the specific ways in which the EU and the neighborhood of greater Europe can achieve higher energy security in their future by diversifying away from Russia, Incorporated – Gazprom.

Glossary of Terms and Acronyms

- Btu:** British Thermal Unit. A unit of energy measurement; equivalent to the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit.
- CCS:** Carbon Capture and Sequester. The process of trapping CO₂ after combustion of a hydrocarbon fuel source and then safely storing it, normally underground. While normally deemed a possible process for reducing greenhouse gas emissions from coal burning, it could be applied to natural gas as well.

- EU:** European Union 27.
- Gas:** Natural gas, a gaseous fossil fuel consisting primarily of methane but including significant quantities of ethane, butane, propane, carbon dioxide, nitrogen, helium, and hydrosulfide. Natural gas must undergo extensive processing to remove almost all materials other than methane can be used as a fuel.
- Greater Europe:** For the purpose of this article, all non-Russian Europe including Turkey. These countries account for more than 99% of Russia's current gas sales and are a convenient term of reference.
- kWh:** Kilowatt-hour. A unit of energy measure equal to 1,000 watt hours, the amount of energy expended for a one-watt load drawing power for one hour.
- LNG:** Liquefied Natural Gas. Natural gas that has been processed to remove valuable components such as helium, impurities such as water, and heavy hydrocarbons and then condensed into a liquid at almost atmospheric pressure by cooling it to approximately -260 degree Fahrenheit (-163 degrees Celsius).
- NATO:** North Atlantic Treaty Organization.
- NEGP:** Northern European Gas Pipeline. Also known as the Nord Stream.
- Neo-con:** Neo conservative. Term for ultra-conservative right wing Russian politicians.
- OPEC:** Organization of the Petroleum Exporting Countries. Frequently referred to as a cartel; an organization of 12 oil producing states concerned with stabilizing world oil prices through the coordination of activities, to include production quotas.
- Prirodnadzor:** Russian Ministry of the Environment.
- Proven Reserve:** Those quantities (of natural gas) that geological and engineering information indicate with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions.
- PSA:** Production Sharing Agreement. A contractual agreement between a state and investor(s) delineating the terms for the exploration and extraction of mineral resources.
- R/P:** Reserves-to-Production Ratio. The reserves remaining at the end of any year are divided by the production of that year; the result is the length of time that those remaining reserves would last if production were to continue at the level.
- Renewable:** Energy derived from resources that are regenerative or for all practical purposes cannot be depleted. Types of renewable energy resources include moving water (hydro, tidal and wave power), thermal gradients in ocean water, biomass, geothermal energy, solar energy, and wind energy.
- Rosnedra:** The Russian Federal Agency for Subsoil Use.
- Train:** Facility within a LNG plant for large-scale liquefaction of natural gas for transport by specially constructed container ship.
- UGS:** Unified Gas Transportation System. The entire system of natural gas distribution of the Russian Federation, consisting of 155,000 km long network of pipelines and gas compressor stations.

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