

Russia and the European Union: An Outlook for Collaboration and Competition in European Natural Gas Markets

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Abstract: In the aftermath of recent natural gas and oil supply disruptions to European markets, Russia's long-term supply stability and Europe's natural gas market developments are of utmost concern to both the producer and the consumer. As Europe's indigenous supply declines, it will rely more on gas imports. Concurrently, Russia's domestic gas consumption is growing, its infrastructure continues to age, and Gazprom will continue to rely on both Central Asian imports and growth from independent gas producers to meet its long-term supply commitments. This article discusses a medium-term outlook for Russia and the European Union and outlines the barriers that are inhibiting competition and collaboration in the energy sphere.

Keywords: competition, energy markets, energy security, European Union, natural gas, oil, Russia

In the past year, the security of natural gas supplies has emerged as one of the top issues of concern for countries in Europe, for the European Union (EU) and the North Atlantic Treaty Organization (NATO), and even for the United States. Concerns about natural gas security reflect uncertainty about available natural gas supplies, how supplies are delivered to the market (by pipeline or by liquefied natural gas tanker), and how much is paid for these supplies. In the aftermath of natural gas and oil supply shutoffs from Russia, Europe is trying to ensure its own security of supply through diversification and energy efficiency. Russia is trying to ensure energy security by diversifying its customer base, investing in the entire value chain (not only the upstream), and ensuring adequate investment levels both in its own energy supplies and those of its Central Asian neighbors.

The way in which the policies of regional and international organizations differ from the policies of individual states is hampering progress on energy market liberalization and energy efficiency programs, both of which are necessary to achieve stable market relationships between producers and consumers. To accurately frame the policy debate, one must understand the current and future role that natural gas plays for Europe's energy mix.

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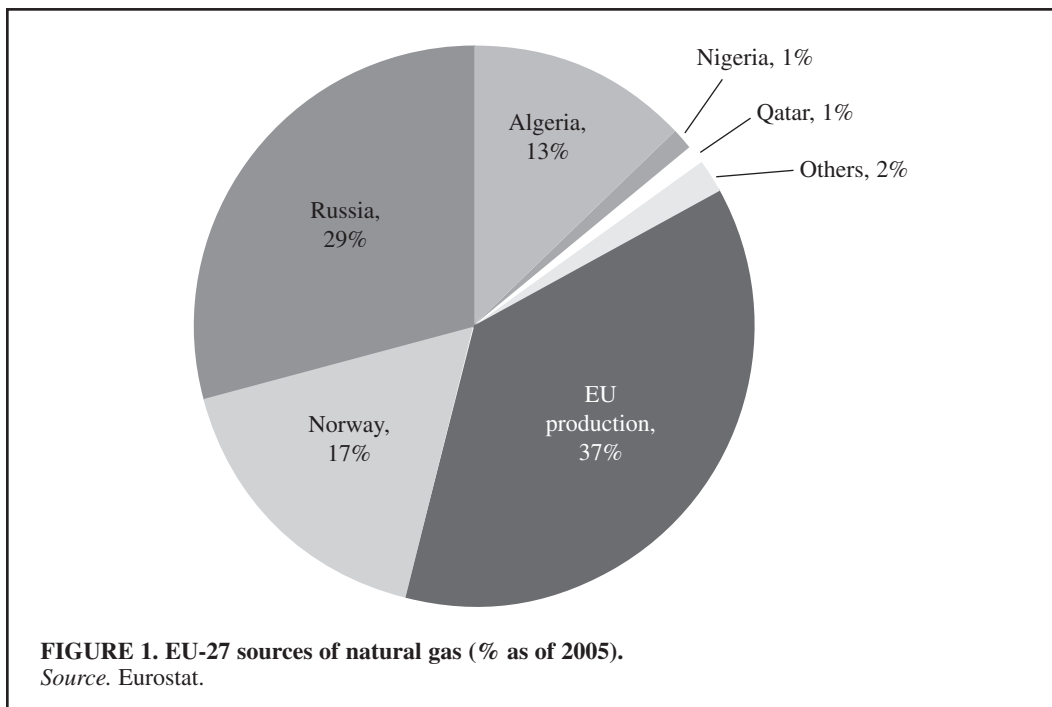
Europe's demand for natural gas is increasing and Russia is the region's main supplier. However, Russia's ability to invest in upstream natural gas development over the next several years will directly contribute to Russia's natural gas production growth and Europe's security of supply. In the meantime, several alternative energy sources and hedging instruments are expected to mitigate Europe's dependency. For the region to best take advantage of these options, continued regional natural gas market liberalization is necessary.

Europe and Russia's Natural Gas Interdependence

In 2006, Europe depended on Russia for 34 percent of its natural gas imports, including European LNG imports (see figure 1). In contrast, Russia depended on Europe for 60 percent of its natural gas exports, sending the remainder via pipeline to the Commonwealth of Independent States (CIS), predominantly Ukraine and Belarus.¹ In evaluating Europe's true dependency on Russian natural gas imports, it is essential to understand the role that it plays in the total energy mix. In the decade after the mid-1990s, oil's share in Europe's primary energy consumption fell by around 3 percentage points while natural gas's share increased by twice this amount, to around 24 percent of final consumption.

On the one hand, Europe's natural gas consumption growth could slow in the future. Since the mid-1990s, EU demand for natural gas has been growing at a rate of around 4 percent per year.² The International Energy Agency (IEA) estimates that, over the next several years, the EU's demand for natural gas will grow at a slightly lower rate, by around 0.8 to 1 percent per year between 2004 and 2015.³

Even though the growth rate is expected to slow in the next several years, as figure 2 shows, Europe's natural gas import dependency is still more than 30 percent higher today than it was only a decade ago. This is partly a result of stagnating production growth from



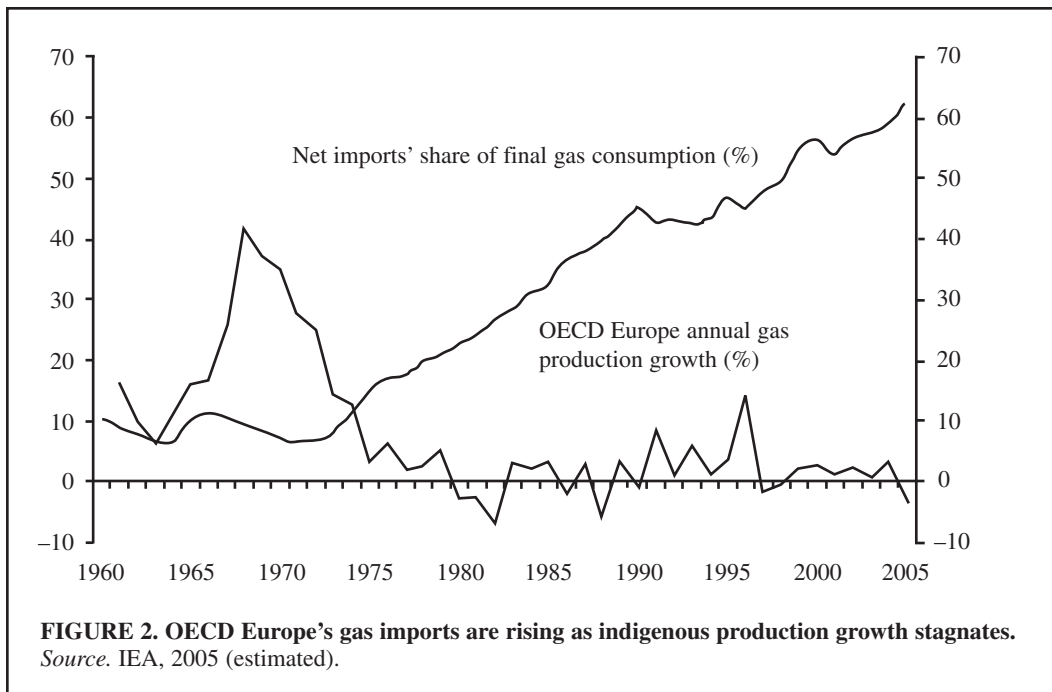


FIGURE 2. OECD Europe's gas imports are rising as indigenous production growth stagnates.
Source. IEA, 2005 (estimated).

indigenous natural gas fields, but it can also be attributed to the gradual deregulation and privatization of Europe's electricity industry. Natural gas-fired plants are in higher demand now with independent power producers (IPPs) because they are cheaper and easier for them to site and build than other types of generation. Also, IPPs prefer flexible contracts, which are better suited for natural gas than for other fuel sources. The growth in natural gas use for power generation will constitute the largest portion of total incremental gas use over the next several decades.⁴ Natural gas-fired generation is also less carbon intensive than coal- and oil-fired generation and is more economical than renewable energy.

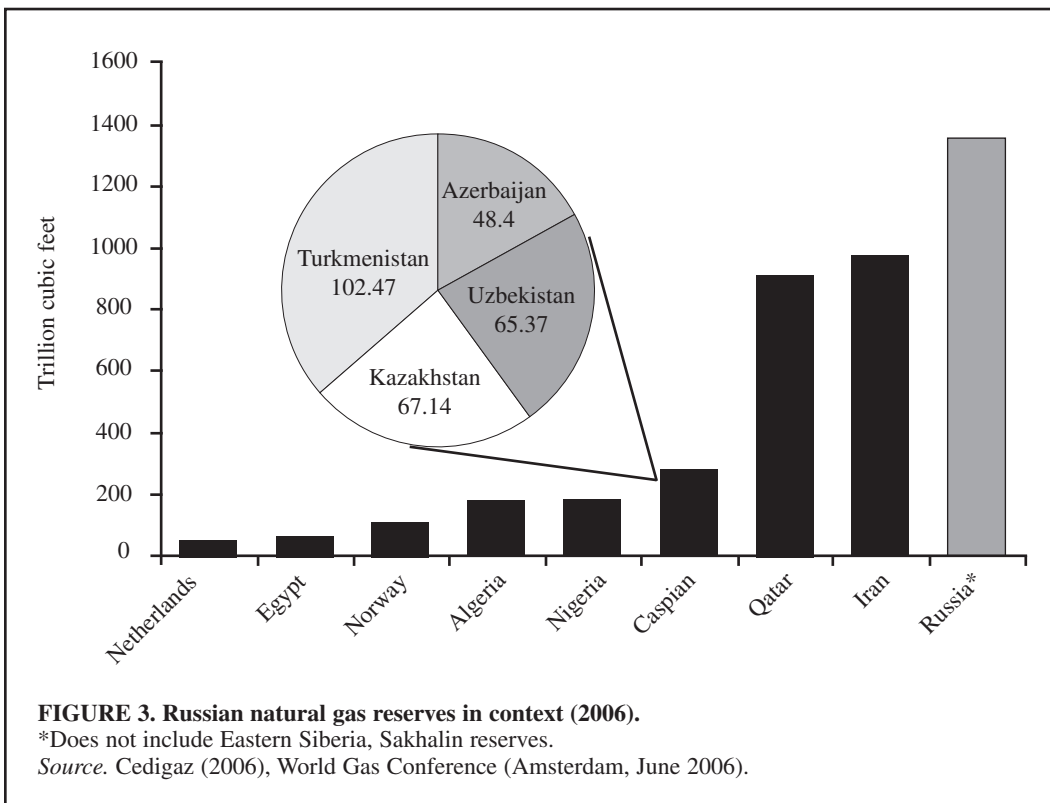
Russia's Midterm Energy Balance and Its Implications

Looking forward, rising demand not only in Europe but also in Russia is expected to continue. Russia's natural gas consumption is growing in part because of lingering inefficiencies in the natural gas transmission network and in part because of the power sector's shift away from oil as a primary fuel. The IEA estimates that, in 2004, roughly 70 billion cubic meters (or one-third of Russia's exports) either leaked in the form of methane in the course of transmission or distribution, were used as fuel natural gas for transmission, or were flared by oil companies. More than half of this amount is being used at compressor stations to transport the gas in the transmission system.⁵ Consulting firms, including Cambridge Energy Research Associates, estimate that the volume of flaring at oil fields is roughly 15 to 20 billion cubic meters (bcm), near official Russian estimates. Although the amount of energy spent on moving the gas is commensurate with the size of the transmission system, significant efficiency gains could be achieved by reforming the infrastructure.⁶ The balance of Russian natural gas exports available to serve both growing European and Russian demand is a key variable in framing the policy debate about European energy security.

Based on available reserves (see figure 3) and economics, Europe will spend the next several years closely managing its energy relationship with Russia. Russia's reserves are larger than any other country, and it is the world's largest producer.

Nevertheless, the long-term sustainability of Russian natural gas supply is in question. Although Gazprom sells around 30 percent of its natural gas exports to Europe, these sales represent almost 60 percent of its total natural gas export revenues. Twice as much of Gazprom's sales (by volume) are to the domestic market at below-market prices, hurting Gazprom and other natural gas companies' incentives to invest.⁷ The eventual increase of domestic Russian natural gas prices to market parity has a number of different ramifications for Europe. First, it will mean that Russia will finally have incentives to invest in energy efficiency, reduce flaring, and turn over aging capital stock. In combination with years of relatively low sales prices to CIS countries, domestic sales at below-market prices have hurt Gazprom's profits and have reduced its ability to invest in the upstream. Second, increasing prices in the domestic market will help Gazprom replace its declining west Siberian fields with new ones in the Yamal Peninsula and will also help build new storage and transportation facilities.

European countries criticize Gazprom for not investing in developing new fields such as those in the Yamal Peninsula and for not including foreign investors in developing the offshore Shtokman field in the Barents Sea. Instead, in 2007, much of Gazprom's expenditures will go into acquiring new assets in Europe and Russia, expanding its transportation network in northwest Russia, and planning for the expansion of international natural gas export routes. In 2007 fewer than 20 percent of Gazprom's investment has gone toward



upstream projects.⁸ The Yamal and Shtokman fields will challenge Gazprom's project management and technological capabilities. Although Gazprom has ruled out equity participation for foreign companies in Shtokman's development, it is highly unlikely it will be able to develop the field on its own.

Shtokman, located almost four hundred miles north of land, in water that is one thousand feet deep, and well within the iceberg region of the Barents Sea, could require \$12 to \$24 billion in investment.⁹ Developing the Yamal field could require up to \$80 billion, more than half of which would be needed to build infrastructure to transport the natural gas into the rest of the Russian natural gas transmission system.¹⁰ From a business standpoint, Gazprom's predominantly state-owned financial structure means that the company's decision making is tightly connected to the financial and political stability of Russia itself, which represents added business risk for the predominantly privately owned companies that are seeking to participate.

Although Gazprom now has access to foreign debt to fund its capital expenditures, high levels of debt and continued uncertainty about natural gas market liberalization in its two primary markets, Russia and Europe, have hampered its investments. Reformation of the natural gas price in Russia is politically problematic because of the integrated nature of the natural gas and electricity sectors. The electricity sector depends on cheap natural gas, which removes incentives to reform inefficient, Soviet-era energy infrastructure.

Investment challenges mean that substantial, medium-term gains may not be able to stem the decline from Russia's mature producing regions. When these new frontier regions of Shtokman and the Yamal Peninsula come on line, Russia will work to lessen its own transport dependency on Ukraine and Belarus, through which almost 90 percent of its current natural gas exports flow. Gazprom's proposed Nord Stream pipeline to Germany and the Blue Stream pipeline expansion to Turkey will essentially encircle Europe from the north and south and will help diversify Russia's export routes, but will do nothing to help Europe lessen its dependency on Russia. Finally, by the time these routes are operational (Blue Stream expansion around 2010 and Nord Stream around 2012), Russia's natural gas prices will hopefully be closer to parity with Europe's, lessening Russia's incentive to export natural gas thousands of miles away for little incremental profit.¹¹

Russia will also work to lessen its own dependency on Central Asian natural gas imports, a crucial component in Russia's supply balance. This year Russia expects to buy 55.7 bcm of Central Asian gas from Uzbekistan, Kazakhstan, and Turkmenistan. By 2008–9, Russia expects to obtain around 70–80 bcm per year at prices of around \$100 per thousand cubic meters (mcm). Most of Turkmenistan's natural gas is sold to Ukraine via intermediaries for around \$130/mcm, still well below market value and at levels that only barely cover the cost of purchasing plus transport costs. Gazprom needs to ensure secure supply from Turkmenistan after its current gas contract with the country expires at the end

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of 2009, otherwise Chinese customers could begin competing for Turkmen gas.¹² According to a draft program released by Gazprom in April 2007, Gazprom's own production is expected to increase from 556 bcm per year to between 633 bcm and 656 bcm per year by 2030, while independent producers are expected to increase their output at a faster pace, doubling output to as much as 194 bcm per year. Still, to meet forecast domestic demand of 495 bcm per year and export contracts of more than 400 bcm per year, around 70 bcm per year will also need to continue to be purchased from Central Asia.¹³

Alternative Sources of Supply for the EU

Besides Russia, continental Europe's major pipeline natural gas suppliers are the Netherlands, Norway, the United Kingdom, and Algeria. Although continental Europe recently began receiving Norwegian natural gas via the Langeled pipeline (20 bcm per year), sales to Europe are expected to increase by around 10 bcm per year until 2012 and then level off in the range of 125 to 140 bcm in the years following.¹⁴ In the United Kingdom investment in offshore natural gas fields is already declining by around 25 percent this year, while natural gas demand is expected to increase the most of any European country.¹⁵

One recently resurrected proposal is the Nabucco pipeline, which would entail the construction of a pipeline from the Caspian Sea region to Western Europe and would bypass Russia. The Nabucco project aims to transport natural gas from Iran, Azerbaijan, Turkmenistan, and Kazakhstan to the countries of Central and Eastern Europe. Iran has sizable natural gas reserves that are currently accessible to remote parts of Turkey via a small pipeline. The proposed Nabucco line will require coordination from EU members and at least five governments. The South Caucasus Pipeline (SCP), which began commercial operation in the last year, was proposed more than eight years ago and involved only three separate countries. Also, the Nabucco line may inevitably carry at least some Russian natural gas from an expanded Blue Stream pipeline for several reasons. First, the quantity of proven Azerbaijani reserves is small in comparison to other alternatives. Second, Iranian reserves might be more economical if they are exported to the south as liquefied natural gas (LNG). Third, exports of natural gas from Turkmenistan and/or Uzbekistan via non-Russian territory will require a trans-Caspian Sea pipeline. The latter is complicated by a lack of agreement among some Caspian Sea littoral states about the sea's delimitation. Finally, United States policy toward Iran could also complicate foreign investment in the project.

The development of LNG terminals, mostly in Spain and Italy, is another way Europe is diversifying its energy supply. LNG imports will increase the number of countries that can provide natural gas by increasing the liquidity of the market through short-term contracts and spot trades.¹⁶ Still, LNG-related infrastructure growth will compete in some countries with natural gas pipeline proposals, and Europe will be susceptible to rising LNG demand in Japan and South Korea. LNG imports currently represent only 10 percent (or 50 bcm) of European natural gas consumption, making natural gas supply security mostly a regional problem for now. Over the next couple decades, LNG imports will represent a larger share of Europe's energy import mix. For example, whereas LNG trade represented almost 30 percent of worldwide region-to-region natural gas trade in 2006, the IEA forecasts that by 2030 that figure will increase to around 50 percent.¹⁷

Finally, Europe is diversifying its energy supply by expanding its current pipeline transport agreements with Libya and Algeria. Libyan natural gas exports to Europe are increasing rapidly with the Western Libyan Gas Project (WLGP) and the \$6.6 billion, 32-

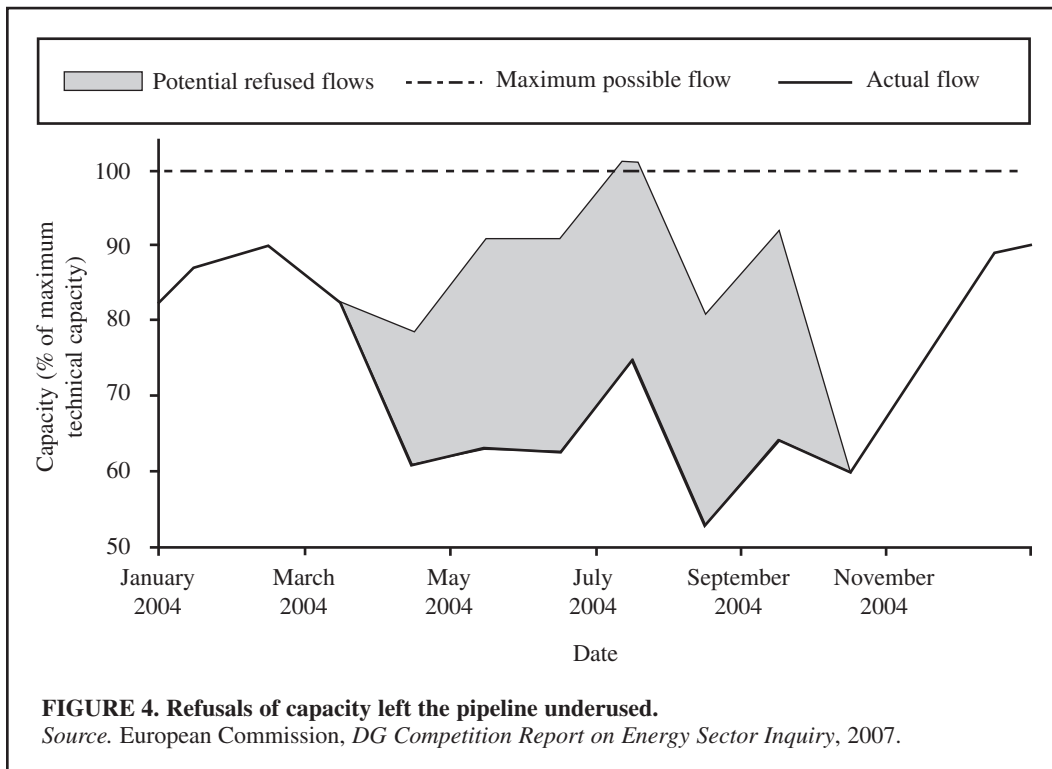
inch, 370-mile “Greenstream” underwater natural gas pipeline that came on line in October 2004. Previously, the only customer for Libyan natural gas was Spain’s Enagas. However, the WLGP has now expanded these exports to Italy and beyond. Currently, about 8 bcm per year is piped to southeastern Sicily. After that, the natural gas flows to the Italian mainland and then to the rest of Europe. Algeria also plans to increase natural gas exports with the Medgaz and Galsi pipelines, which, in combination, could add as much as 10 bcm to the natural gas supply.¹⁸

Supply Security and Inefficiency in Europe’s Natural Gas Market

As long as there is a perceived threat that Russia may someday repeat its stoppage of natural gas exports to its transport neighbors because of contractual or political disputes, efforts to curb Europe’s dependence on Russian natural gas imports will escalate. Gazprom’s natural gas supply cutoff to Ukraine jump-started the EU’s natural gas market liberalization process, and the threat of continued contractual disputes with more of Russia’s neighbors remains acute because contract negotiations occur each year.

The European Commission estimates that roughly \$300 billion must be spent on natural gas infrastructure in Europe in the next twenty-five years.¹⁹ Arguably, the ideal way to achieve this investment will be through efficient market mechanisms. Current inefficiencies in Europe’s pipeline system, cited in a recent European Commission report and illustrated in figure 4, indicate that uncoordinated management of natural gas flows and continued preferential access to capacity is leading to pipeline underutilization.²⁰

From a regulatory standpoint, although the European Commission has created a framework of guidelines to achieve a single EU natural gas market, governments will implement



EU directives differently. As the EU tries to diversify away from Russian natural gas, Hungary's prime minister has called the Nabucco pipeline a "dream" and supported the Blue Stream expansion.²¹ In the area of market liberalization, countries are apt to maintain their own national energy "champions." Without stronger regulation, independent processes could lead to divergent outcomes that might limit the ability of new participants to access the transmission system. Consequently, it may complicate third parties' ability to economically transport natural gas across international borders.

Additionally, each country in Europe has a different interpretation of how fast liberalization should occur. Today, the natural gas transmission company is a national monopolist instead

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of one that competes in a Europe-wide regional market. Competition between natural gas traders occurs only on a limited basis. Until a regional market develops, supply decisions on behalf of predominantly state-owned natural gas companies will continue to be unilateral, which may ensure long-term stability, but at a cost to economic efficiency. The uncertainty surrounding Russian natural gas supply has exacerbated reactions because of differences in each country's level of dependence, its geography, and its historical relationship with Russia.

Storage Capacity's Role in Natural Gas Markets

A more developed market will require that buyers and sellers have access to hedging instruments, one of which is natural gas storage. As production from indigenous fields declines and as natural gas imports (pipeline and LNG) increase, more dynamic storage capability will be needed. There are three main types of storage capacity: depleted oil or natural gas fields, aquifers, and salt caverns. Salt caverns are the most flexible because of their high performance attributes and because they are able to provide large supplies of natural gas relative to their holding capacity in peak demand situations. Currently, Europe has a little more than 10 percent of its working volume of this type; the majority of Europe's storage volumes are in depleted oil and natural gas fields, which are less flexible and cheaper to finance and develop.

Storage capacity is also not a panacea to ensure stable supplies and prices during times of seasonal fluctuations and in times of contingencies. Storage capacity is usually privately owned. Therefore, under a market system, private companies (not governments and institutions) will need to weigh the costs and benefits of additional storage. As Europe's natural gas market is deregulated and as regional market hubs or prices develop, price signals will help clarify incentives to build new storage. Storage assets could theoretically be accessed by transmission and distribution companies outside the countries in which they are located. As Europe's continental market becomes more open to competition, accessibility to assets in nearby countries should increase.

Incentives to store are often reactions to short-term market signals and longer-term risk avoidance strategies. For example, a local distribution company, using storage to ensure

the reliability of its service, may continue to inject natural gas into storage even when prices are high—such as what occurred in the United States after hurricanes Katrina and Rita, for example—to have enough natural gas in storage to meet its obligations. During this same period, the strong price contango²² between futures contract prices on the New York Mercantile Exchange and the Henry Hub spot price provided economic incentives for commercial operators to either add to storage or minimize withdrawals.

Building storage stocks when supplies are short and prices are high may further raise prices for consumers and may make it harder to build new storage capacity. As the difference between summer and winter prices widens, revenues gained from storage will be high. However, according to William Ramsey of the IEA, the capital costs of building new natural gas storage tend to be higher under a high natural gas price environment and are five to ten times higher than building crude oil storage (on an energy-equivalent basis).²³ The current scenario, with lower seasonal differentials, means that revenues are lower and that profits could be insufficient to drive new investment.²⁴

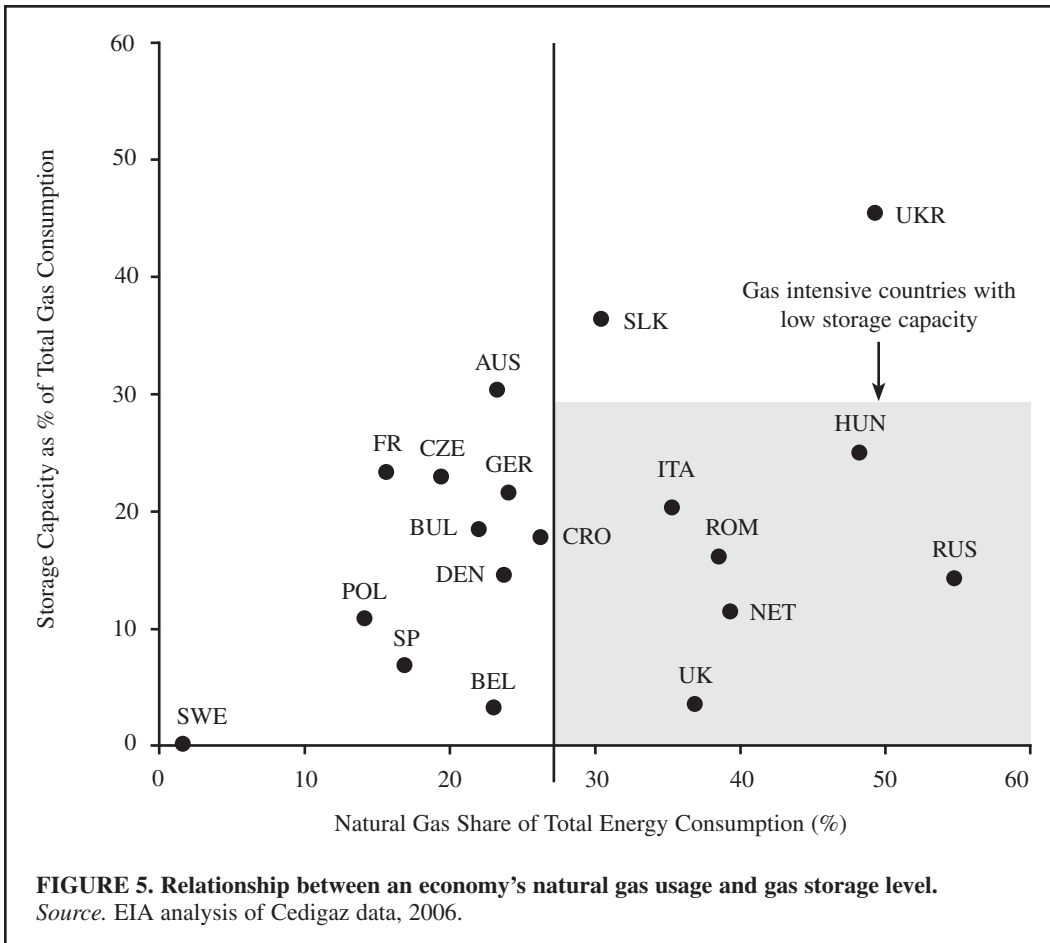
In the absence of market-driven incentives, limited government-owned or government-subsidized storage can be an option to stimulate the construction of adequate supplies during contingencies. However, the public sector runs the risk of distorting the price signal that would otherwise motivate the private sector to invest in storage capacity. In theory, as long as regional markets continue to develop, these signals will become more transparent. Without continued regional market liberalization, market decision making that concerns storage or supply contracts will not fully encapsulate the various supply and demand dynamics at play.

Today, many European countries already have relatively sufficient levels of storage capacity compared with their levels of natural gas intensity (see figure 5).²⁵ The shaded box in figure 5 shows some countries where storage capacity levels are relatively low given their consumption intensities. Notably, Italy and Hungary, both of which have made bilateral long-term supply agreements with Gazprom, fall into this category. Still, the concern is whether market signals are enough to provide incentives for sufficient levels, and for the right type of natural gas storage. Even if the economics for construction of new storage capacity is not justified today, natural gas transmission companies will eventually need the added flexibility that the combination of interruptible contracts, a spot market for natural gas, and natural gas storage will offer.

Conclusion

Europe's natural gas demand and natural gas imports are expected to increase in the next decade, in tandem with lower indigenous natural gas production. Russia's uncertain investment environment and its recent contract disputes have spurred fever-level dialogue in Europe about how to ensure its energy security. In the meantime, short- and long-term strategies are being proposed in Europe and Russia to ensure producer and consumer interdependence.

However, the slow implementation of the European Commission's natural gas liberalization directives creates uncertainty for market participants about the overall costs and benefits of transition. One can characterize the European market as one in which contract prices are pegged to other fuels, where prices are marked to one or more primary natural gas pricing hubs, and where there are several dominant market players with control of the upstream and downstream sectors. Suppliers are interested in and know how to supply these markets, with high liquidity and a few strong players. In contrast, a market with uncertain liquidity and numerous weaker market participants is more difficult to supply.²⁶



Gazprom is concerned about the evolution of natural gas markets in its primary market. Chairman Aleksei Miller has said, “Long-term contracts provide for an indispensable comfort in gas trading: constant gas supplies and predictable prices.”²⁷ Although deregulation often results in more market transparency, there is no substitute for the one operator’s ability to make long-term supply and demand decisions in its service area. It is possible that Russia’s efforts in the last year to make long-term supply contracts with France, Germany, Italy, and Austria for terms of up to twenty-five years are a result of a need to hedge against market liberalization in Europe. President Putin’s hints about the possibility of an OPEC-type cartel for natural gas, regardless of whether coordinated pricing is even possible, is another way Russia can promote more bilateral energy deals with individual countries.

The EU’s understanding that Russia desires to extract more economic rents from its existing natural gas supplies is a key influence on its interpretation of Russia’s actions. Likewise, Russia’s comprehension of how EU members define energy security will help it plan for the future. Russia and the EU have established a producer-consumer dialogue, and EU Energy Commissioner Andris Piebalgs recently met with Russian Energy Minister Viktor Khristenko to discuss an early-warning mechanism to avoid future energy disruptions.²⁸ Arguably, continued producer-consumer dialogue might lead to more European investment in the Russian energy sector. Unfortunately, if the EU does not have European

countries' authorization to make those commitments and to sign new contracts, real progress could be challenging.

Additionally, the gradual liberalization of Europe's energy markets will facilitate the entry of new natural gas from LNG and alternative pipeline routes, thus diversifying the region's energy supply. But the continued lack of muscle behind the European Commission's directives contributes to national energy policymaking at exactly the time when pan-European collaboration would be most effective in achieving energy security. Until the case can be made in Europe that the efficiency gains from competition will result in secure supply and lower prices, the cooperation needed to implement the EU's directives is unlikely to occur.

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