

European Gas Supply Security and Geopolitics

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Introduction

Natural gas plays an important role in the world's energy portfolio, and IEA forecasts an increase of its share in coming years. There are several reasons for this. Among them the most important are:

- Natural gas is an environmentally clean fuel and it gives less carbon emissions than coal,
- The global reserves of natural gas are more abundant than oil, this makes it cheaper and calls for the substitution of gas for oil in heating (mostly accomplished) and transport (just starting).

Europe depends on natural gas less than on oil, but due to depletion of domestic reserves (in Netherlands gas production will decline while in Norway it will stay on a plateau at 110-120 bcm/y in the next decade before eventual decline) its dependence on imports will increase.

In 2011 Europe imported 248 bcm of natural gas (47% of its demand); in 2020 it is projected to import 288 bcm or 56% of demand, while in 2035 the projection is for imports of 390 bcm or 87% of demand.

One of the reasons for less optimism about the EU's future gas consumption is failure of the program for a rapid substitution of gas-fired for coal-fired electricity plants. At present, the market for carbon dioxide has collapsed in Europe, and policy makers did not provide any subsidy for it while providing much larger subsidies for renewable energies, especially photovoltaics.

We see that gas demand in Europe is shrinking comparing to the previous forecasts. While this is mostly a middle term phenomenon of a 10 year horizon, demand can be driven by other than economic factors. The goal of this paper is to study to what extent geopolitical concerns and energy security reasons can be the drivers of such an outcome.

Economic Perspectives for Future Gas Supply

Indeed, there is no global shortage of natural gas in the coming several decades, contrary to oil, where the production peak (at least for conventional oil) either has already occurred or will come soon. Iran and Qatar hold 15% and 14% of world reserves, and their reserve/production ratio stays well above the global average. This means that they can substantially increase natural gas exports in the coming decades. It is expected that between 2011 and 2035 Iran will increase its production by 56 bcm, while the increase in Qatar is 86 bcm (WEO2013). The growth of Russian production can be even more substantial – by 135 bcm. Most of this gas will go for exports. Additionally more gas for export can come from Algeria, Nigeria and Venezuela and other countries. Yegorov and Wirl (2011) argue that based on purely economic reasoning (cost optimization and reserve-to-production-ratio) the future conventional gas market will be dominated by Russia, Iran and Qatar, while countries with lower fractions of global reserves (like Algeria and Nigeria) will be important suppliers only in the middle run, before their reserves are depleted.

Should then Europe care about a gas shortage? While global demand is uncertain (mostly because of fast growth in China), it is clear that it is easy to satisfy European growth in demand for gas imports. If the question has a purely economic origin, the answer would be a clear “no”.

The Role of Geopolitics

In economic literature it is common to find purely economic rationality for all decisions. However, in the case of natural gas the role of geopolitics is very high. Several case studies have been presented in the book edited by Victor, Jaffe & Hayes (2006) while the theoretical analysis was developed by Yegorov & Wirl (2010).

Briefly, transport costs and especially fixed costs of investment in infrastructure are very important for natural gas. That is why geographic location plays a very important role. In some cases, especially for land locked countries, a pipeline (the only way of gas delivery) is either never built (like a pipeline crossing Afghanistan) or built with delay (the export route from Turkmenistan to China).

If we look at those countries that have the largest reserves and thus will dominate future gas export, we can easily see that many of them are considered politically non-secure. This presents a complex issue.

If there would be no sanctions over Iran, Europe could have included it as potential supplier to the Nabucco project to keep it alive. Given recent tensions in Iraq, there is a chance of cooperation between the U.S. and Iran on this issue, and lifting of sanctions can happen sooner rather than later. In this case Iran can become a substantial competitor of Russia in the European gas market. This is

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See footnote at end of text.

a medium term perspective, since the development of additional capacities for Iran (especially in gas transportation) requires substantial investment and time.

However, if these options become realistic, Europe could revise its future forecast for natural gas consumption. If Russian gas exports to EU would remain constant, an additional 50-100 bcm from Iran could allow Europe to make more gas for coal substitution. The gas from Iran is likely to be even cheaper than shale gas from the USA after liquefaction, and thus will be competitive and not allow gas prices in Europe to rise.

However, geopolitics today seems to play a negative role for Europe, forcing it to lock in economically inferior outcomes. While gas supply from Russia and Iran to EU could be abundant in the future, non-economic reasons (like sanctions) limit those future flows of natural gas from Russia (the country that has set contracts with China in 2014 to supply 68 bcm of gas via 2 pipelines to be constructed) and Iran (which can supply cheap gas from the world's largest South Pars deposit).

European Energy Security: Different Views

It became common to use the term "European energy security" after the gas conflict between Russia and Ukraine in January 2009, resulted in a temporary termination of the physical flow of imports to the EU. Balkan countries were exposed to even larger losses. Energy security in gas supplies necessitates broader diversification of import sources, construction of additional gas pipelines between EU countries and more storage capacities.

From purely economic perspectives (based on an assumption of a rational consumer) the acceptable level of security has to be chosen based on the analysis of different scenarios for losses and the choice of measures to divert them that would have minimal cost.

We know that Nabucco has been one of the projects of that type. However, the capacities of Azerbaijan have been insufficient to make it economically viable, while Iraq is still not secure, and Iran is out of consideration because of U.S. sanctions.

If one minimizes transport cost, energy security cannot be guaranteed. As we can see from Figure 1,

transit routes from Russia to EU today have to pass either transit countries, or to use more expensive transit over the bottom of the sea.

The Case of Ukrainian Gas Transit

Historically, most natural gas transit routes from Russia to EU were through Ukraine. This did not matter in the time of the USSR, but became very important in recent years. While Russia has proven to be a reliable gas supplier to Europe, Ukraine was not rich enough to sustain the European price for natural gas. For political reasons, it had been subsidized by Russia for many years. But when Russia wanted to raise prices (either to lift the subsidy for political reasons or to move toward market prices), Ukraine bargained very hard (often beyond what is accepted in an economic world). This has resulted in several so called gas wars (2006, 2009) with temporary cuts in transit and with the EU being the loser.

This has raised the issue of European gas security, and resulted in steps to limit dependence on Russia, which supplies about 1/3 of EU gas imports. However, at present this is impossible without a substantial raise in gas prices. After the Fukushima tragedy, Japan has increased its demand for gas. Besides that, Chinese gas demand is growing, pushing most of the flexible gas supply in the form of LNG away



Figure 1. Transit routes for natural gas.

Source: http://en.wikipedia.org/wiki/Russia%E2%80%93Ukraine_gas_disputes

from Europe and towards Asia.

Russia paid attention to European concerns and started two projects – North Stream and South Stream – with the latter (apart from a potential increase in export volume) to bypass Ukraine and thus make gas supply to EU more secure. Both projects can be extended to a capacity of 60 bcm/y. North Stream is already functioning, while South Stream is only planned.

The highest transit over Ukraine was at the level of 137 bcm/y in 2004, just before the Orange revo-

lution. After the construction of North Stream in 2011 it dropped to about 85 bcm/y in 2012 and 2013 (Source: Naftogaz). At present, 16% of the natural gas consumed by Europe flows through Ukraine¹. The share of Ukrainian transit gas in imports is very high for Southern and Central Europe. In particular, Austria, Bulgaria, Croatia, Hungary, Romania, Slovakia and Slovenia are 100% dependent on this transit for their imports. Gas import dependency for those countries is also high. The share of Russian gas in gas consumption is the highest for Bulgaria, at 83.3%, and the lowest for Romania, at 24.3% (Sharpley & Jugde, 2014).

In 2013, 82.3 bcm of EU imported gas (57.6%) came via Ukraine, 37 bcm (25.9%) via Belarus and 23.5 bcm (16.5%) via North Stream. In 2012, all imported gas to Austria, Bulgaria, Croatia, Hungary, Romania, Slovakia and Slovenia came via Ukraine, while Italy, Poland and Czech Republic have between 40% and 50% dependency on this route. (Sharpley & Jugde, 2014).

Pirani et al (2014) analyzed the consequences of a potential interruption of gas transit via Ukraine, given the political situation in early March 2014. Although there have been many political changes since then, we are not aware of a more recent economic analysis. Moreover, most of the conclusions still hold. The authors have found that while gas imports by Ukraine has declined from 50.6 bcm in 2007 to 27.9 bcm in 2013, the value of those imports have risen from \$6.6 bln. to \$12 bln. The presence of outstanding debt for gas by Ukraine has become an issue. The debt was growing, along with payment date, and finally in June Ukraine not only violated debt payments, but also failed to agree on a price. Now the case is being considered by an arbitrator in Stockholm.

In 2014, Ukraine had accumulated about 16 bcm in storage but that is not sufficient for the normal functioning of transit (it requires about 20 bcm in winter). That is why Gazprom warned EU consumers, in the autumn, of the risk of the illegal use of part of the transit gas for domestic Ukraine consumption.

While the final agreement about gas supply from Russia to Ukraine was reached on October 31, 2014, there is still a danger of an interruption to Europe in the winter 2014/15. Much depends on the ability of Ukraine to pay for this gas with further complications likely if it is unable to do so (see gas transit game analysis in Wirl & Yegorov, 2009).

South Stream, Blue Stream and European Gas Security

The South Stream project has enough capacity (63 bcm) to bypass Ukrainian transit, and at the same time additional capacity to bring any gas from the south, including the Caspian area. Besides that, Russia was going to finance this project which obviously brings more energy security to Europe.

While it is clear that South Stream is vital for EU energy security, especially for Bulgaria, a final decision on its construction was blocked in June 2014, possibly following political pressure. Here we observe how political forces can prevent a country from making rational economic decision.

The formal reason for the blockage is the Third Energy package. According to it, there should be free access of third parties to the pipeline. If South Stream would be a joint investment project between Russia and EU and if there would be a clear partner that could fill it, that possibly would make sense for Russia. Given that it is a win-win project for Russia and EU, it is strange, that some formal EU legislation can block it.

While it is becoming clear (and the winter 2014/15 can only prove it again) that only the construction of South Stream can guarantee energy security to South-East and Central Europe, there have been continued attempts to block it and even political pressure on some EU countries (like Hungary) that had chosen to enhance their future energy security by supporting it. In fact, blocking finally became successful and on December 1, 2014, Gazprom took the decision to stop South Stream and to replace it by expansion of the Blue Stream to Turkey; the corresponding agreement between Russia and Turkey was signed the same day. While Russia has practically no losses from this substitution, EU energy security is not likely to increase because Turkey will have too much market power over transit even though the Third Energy package of EU, which should prevent this, is now formally ratified.

Conclusions and Policy Implications

Geopolitics plays a very important role in the natural gas industry and it happens on several levels. The first level comes from the importance of geography for gas supply routes. If the delivery is by pipeline, then a transit country becomes a local monopolist that can influence this supply and play rent-seeking games. In the case of LNG, geopolitics plays a lesser role (since there are many sea routes to connect two particular ports) but it can still play a role if control over some vital straits or channels can take a non-economic form.

In the year 2014 geopolitics became even more important. Before 2014 we saw it as a limit to Iranian

access to global markets for its natural gas (only Turkmenistan and Turkey had gas trade with Iran), while sanctions against Russia (following its policy regarding Ukraine) are bringing a threat to future gas trade between Russia and EU. The reason is far from economic; moreover, it contradicts all principles of free trade. Russia is already looking towards China, and two long term contracts (for 38 and 30 bcm/year) that will make China the largest buyer from Russia after construction of the related pipelines.

What will this imply for Europe? Despite widespread talk about plenty of cheap LNG from the USA soon, those volumes cannot substitute for Russian gas. The possibility of Norwegian gas supply are limited, and new LNG projects in Africa and Australia will supply gas at prices above current European rates, due to high transit costs. Meanwhile Germany pushes for too much expensive renewable energy with a lot of coal in electricity production, making its transition to a lower carbon world more expensive.

Footnote

¹ <http://www.eia.gov/todayinenergy/detail.cfm?id=15411>

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