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# Taming the bear: American liquified natural gas (LNG) exports and the negation of Russian influence in Europe

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**ABSTRACT**

The rapid growth of US LNG exports is promoted by the US government in Europe as a viable substitute for Russian gas. But is American LNG actually the "game-changer" that some officials claim it to be? At one level it is not, simply because LNG is more expensive than Russian gas and plays a relatively small role in the overall energy mixture used in Europe. Taking a broader perspective, however, American LNG acts as an underwriter of European energy security and deprives the Russian government of the ability to use Europe's energy dependence to Russia's political advantage; any attempt by Russia to cut supply or raise prices would be neutralized by increased LNG imports. A combination of EU -level planning, national government measures, and American LNG export essentially force Russia to behave as a normal commercial partner.

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## Introduction

European reliance on Russia for natural gas dates back to the depths of the Cold War. Between 1968 and 1976, major NATO members such as West Germany, Italy and France began to import significant amounts of natural gas from the Soviet Union, a trend that increased dramatically in the 1980s (Hogselius, 2013, p. 4). The assumption that such economic exchange created an interdependence that the Soviet Union would not threaten out of consideration of its own economic self-interest ameliorated fears that Russia's gas exports to Europe were a strategic vulnerability (The Soviet Gas Pipeline in Perspective, 1982). Energy interdependence with the Soviet Union became an issue of contention between the US and its European allies as pipelines were built to bring Soviet gas to Germany, but the Soviet Union did not actually attempt to use its position as a major energy supplier for political purposes (Davis, 1982). It was a commercial relationship that provided an important source of export earnings for the Soviet Union, and tensions in other aspects of the Soviet relationship with European states did not affect the energy trade.

A series of moves by the Russian government in the 2000s, however, brought into question the assumption that the gas flow from Russia would remain free of political considerations. Despite the existing contracts, Russia attempted to raise the gas price it demanded

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from Ukraine beginning in the depths of the winter of 2005. Ukraine is, of course, the main transhipper of Russian gas and receives payments for this service as well as inexpensive gas. Thus, this threatened gas supplies in much of Europe, not just Ukraine. When negotiations failed, Russian energy giant Gazprom stopped supplying Ukraine with gas in January 2006 and again in January 2009. On both occasions, Ukraine diverted to domestic use some of the gas intended for Gazprom's European customers to pressure Russia. While this brought the crisis to an end quickly in 2006, a standoff ensued in 2009, leading to the complete shutdown of the Ukrainian gas transit corridor for two weeks (Noel, 2019).

The gas crises of January 2006 and 2009 may be viewed as being caused by Ukrainian as well as Russian actions. Ukraine was paying less than one-third of the market value for gas at the time, and Russia was seeking to take advantage of rising prices for gas. In addition, corruption and mismanagement in Ukraine siphoned off gas earmarked for the European market for domestic use (Pirani, Stern, & Yafimava, 2009; Stern, 2006). But there is little question that Russia's provoking of a crisis leading to the shut off of Russian gas for two weeks in the middle of winter was designed to weaken the Western-oriented government in Ukraine at the time and its standing in Western Europe. These situations and other attempts to extend Russian influence in Europe raised more fears that the gas trade could be held hostage to Russian demands, and the European Union (EU) began to draft an energy security strategy with an explicit focus on ensuring energy flows to Europe in the event of Russian supply disruptions. Concerns over Russia's strategic intentions only deepened with the Russian invasion of Georgia in 2008 and its seizure of Crimea in 2014. The latter event triggered EU sanctions that blocked EU investments or loans for the Russian energy sector, as well as specific sanctions on key officials, some with important ties to the gas industry (Silva & Selden, 2019). Although these sanctions only affect EU investments and do not necessarily block investment by private entities, the sanctions set off a wave of Russian counter-sanctions aimed at EU exports to Russia.

The gas crises sparked a wave of analysis regarding the degree to which the EU-Russia energy relationship can be viewed through a geopolitical or security lens, the utility or even existence of an "energy weapon", and how the EU and the member states have responded to the initial shocks to the system. Scholars from a variety of disciplines argue that the EU-Russia relationship is one of highly complex interdependence that cannot be viewed through a simple geopolitical lens. It is a "close and developing strategic partnership", but economic cooperation is paired with a tense political relationship (Judge, Maltby, & Sharples, 2016, p. 751). That complexity is coloured by the fact that there are many different stakeholders involved in the energy trade including consumers, regulators and private companies, which makes it impossible to reduce the EU-Russia energy relationship to one simply between intergovernmental actors focused on security and "high" politics (Casier, 2016). Even within individual states, there are multiple centres of influence with different priorities. Tatiana Romanova disputes the notion that the EU approach to energy is market-based while Russia's approach is geopolitical and seeks to use Russian energy first and foremost for political influence. Both parties can be seen as having a mixed approach and, although Russia's approach is mainly driven by geopolitical concerns, Russia is not a unitary actor and profit-maximization is often the clear focus (Romanova, 2016). In a similar vein, Tim Boersma argues that, "The notion that Gazprom's and the Kremlin's objectives are one and the same in all situation, also has to

be questioned. The Russian energy weapon against Europe, in short, barely exists, and arguably never did" (Boersma, 2015).

This complex interdependence may make it difficult, if not impossible, for Russia to use the "energy weapon". Andreas Goldthau argues that the point of the Ukraine crises was to increase profits, not weaken the Ukrainian political leadership of the time (Goldthau, 2008). But more to the point are the enormous sunk costs borne by both the EU and Russia in the gas infrastructure that neither can afford to abandon. Thus, the two sides are locked together in a somewhat contradictory relationship with both progressive and regressive elements operating simultaneously (Hadfield, 2016). When and how Russia chose to engage in profit maximization raises questions about political intent, but even if Russia did attempt to use energy as tool of foreign policy, the EU is not a helpless actor. Despite its distinct lack of "hard" power, the EU has considerable soft power and a well-developed regulatory structure that makes it a significant actor in the international energy market. As Goldthau and Sitter note,

> the EU's ability to exert more than mere soft power is a consequence of its attractiveness as a USD 17.3 trillion economy and the world's largest single market, and it is brought to bear by a policy entrepreneur with a well-stocked regulatory toolbox: the European Commission. (Goldthau & Sitter, 2015, p. 942)

It is also worth noting that existing views of Russia in different EU member states can have an effect on policy outcomes, regardless of the degree of national dependence on Russian energy. National identities, and the ensuing conception of Russia that flows from that identity, are significant in understanding policy difference between EU member states such as Poland and Germany (Siddi, 2019). This raises a broader question regarding how the issue of energy security can be conceptualized, and the critical issue is how, "energy security is constructed and contested by multiple actors who all have some claim to be able to 'speak security' within a state" (Kama, 2016).

The argument presented here does not dispute much of the existing literature and attempts to build upon it to explore the transatlantic energy relationship. The EU-Russia energy trade is indeed a complex interdependent relationship that is unlikely to fade for many of the reasons elaborated on above. What is missing from the preceding discussion, however, is a more complete consideration of the potential impact of US LNG exports on European energy security. In the last few years much has changed in the global LNG market and the huge growth in LNG can be leveraged to ensure a consistent flow of energy to Europe even under the most extreme circumstances. The role of US LNG, therefore, is to act as a strategic backstop. Ironically, despite the US government's tendency to view the EU-Russia energy relationship in geopolitical terms, US LNG negates the geopolitical aspects of that relationship and enables a market-based approach where energy resources flow based on, "of transparent legal conditions, market principles and clearly defined institutions" (Romanova, 2016, p. 858).

Despite the tensions in the EU-Russia relationship, EU sanctions on Russia, and Russian counter-sanctions on the EU, the proportion of Europe's gas that comes from Russia remains close to 40 percent and is expected to increase significantly with the completion of the Nord Stream 2 pipeline connecting Russia to Germany under the Baltic Sea (Noack, 2018). The US and many Eastern European states view the German government's position on Nord Stream 2 as naïve at best under the circumstances, and the US is

promoting its natural gas exports as an alternative to Russian gas, going as far as to label it, "freedom gas" (Rueb, 2019). The US gas production boom has indeed made a significant impact on global gas supply and the United States' transformation from gas importer to major exporter in less than a decade is a remarkable story in its own right. But is the US gas production and export boom destined to become a significant factor in the transatlantic relationship? Given the fact that US gas exports will likely remain more expensive than Russian gas because of transportation and regassification costs, it seems highly unlikely that the US or any other LNG producer can displace Russia's position as the predominant source of imported gas in Europe under normal conditions. Russia remains the single largest supplier of natural gas to Europe and that is unlikely to change in the near future for the simple reason that Russian gas is cheaper to bring to market in Europe than from almost any other source. For the most part, the pipeline infrastructure has been in place for decades, and the cost of production is relatively low in Russia. That may shift upward in the longer term, however, as old gas fields become tapped out and infrastructure ages. Western companies are reluctant to invest in Russia given the questionable at best legal protections on such investments, and sanctions complicate the ability of Russia to upgrade its gas infrastructure (Analyst: Western Energy Companies, 2014). Given the current state of affairs, time does not play in Russia's favour, but it would appear at first analysis that Russia's existing predominance in the European gas market continues to give it an ability to use that position to exert increasing political pressure on Europe in the future.

In light of this, President Trump can promote American LNG and, "urge our friends in Europe to use America's vast supply and achieve true energy security" (Trump Urges Europe, 2020), but as numerous analysts point out, this encouragement does not mesh with the current economic reality (Eckert, Vukmanovic, & Zawaski, 2018; Shiryaevskaya, Mazneva, & Carr, 2018). Demand for gas may increase in Europe, but geographically closer suppliers such as Norway and Russia are filling current European demand, are capable of expanding supply, and can bring their product to market at a lower cost than American LNG producers. Therefore, "President Donald Trump's vision of Europe becoming a 'massive buyer' of US liquified natural gas is likely to crash into the reality that Russia is a cheaper supplier for now" (Shiryaevskaya et al., 2018).

"For now", however, is an important qualifier that requires some additional consideration. The same economic logic that relegates US LNG to a relatively minor role in European energy supply under current conditions could mean a much larger role for it if Russian gas supply were disrupted. If Russia attempts to significantly increase prices, it will simply make LNG from the US and other suppliers more competitive in the short-term. If Russia attempts to cut supply, it will not only make LNG more competitive, it will lose market share as more reliable suppliers, including US LNG producers, fill the gap between supply and demand. America's growing LNG export capacity effectively neutralizes Russia's ability to use gas exports for political leverage in Europe. Therefore, America's current and projected future gas production means that projects that increase Europe's reliance on Russian gas, such as Nord Stream 2, are essentially safe investments that cannot be exploited by Russia for political purposes without causing significant long-term economic self-harm. This is fundamentally different from the previous gas crises in which Russia held the dominant position because Europe could not diversify its supply on short notice.

In sum, American LNG production effectively ensures that Russia must behave as a normal supplier and underwrites European energy security. This is made possible by a combination of several factors including EU initiatives to ensure multidirectional gas flow in Europe, increased LNG import capacity in Europe, and US LNG production. It is an emerging area of transatlantic cooperation that has significant ramifications for European security. The following sections detail the current state of Europe's energy supply, the steps taken in Europe to improve energy security since 2006, the effects of the US gas boom, and a brief analysis of how these factors could interrelate to mitigate even an extreme crisis in Russian gas supply.

## The state of European energy supply

Europe relies heavily on imported natural gas; approximately 70 percent of European gas usage is imported. The percentage of imported gas from the top suppliers was relatively constant from 2007 to 2018 with Russia (38%), Norway (25%), and Algeria (22%) as the top three (EU Imports of Energy Products, 2020). LNG imports made up a relatively small share over this period at approximately 15% on average per year. Reliance on imported gas varies considerably across Europe as does the relative level of reliance on Russian exports. The United Kingdom is a significant producer of natural gas and imports relatively little by comparison to most of the rest of the continent (Where does UK Gas, 2020). Eastern European states such as Bulgaria, Poland and the Baltic states are heavily dependent on Russian gas. Germany and Italy stand out as two Western European member states that import significant amounts of Russian gas relative to their total consumption (Communication from the Commission, 2014). Finland is also highly dependent on Russian gas, although it recently opened a pipeline to Estonia that can take advantage of Estonia's LNG import capacity (Noack, 2018). But among the Eastern European states most dependent on Russia for gas, the proportion of gas used in the national energy mix is relatively low. Poland, for example, generates most of its electricity from coal, and gas accounts for only about 10% of its electrical production (Georges, 2018). Despite this wide level of variation across Europe, gas is a critical component of the energy mixture and generates 40percent of the electricity used in the EU member states (Georges, 2018).

The members of the EU also differ widely on their political attitudes regarding energy security and the role of Russia gas in their national energy supply. Germany regards its gas imports from Russia as a purely commercial relationship and tends to downplay any potential vulnerabilities flagged by the US and other NATO allies concerned about the potential leverage this could give Russia over Germany. In fact, the amount of gas exported from Russia to Germany is expected to double with the completion of the new Nord Stream 2 pipeline, which is an indicator of the German government's confidence in the relationship and the expectation that significant portions of the additional gas are to be used outside of Germany (Noack, 2018). Given the interconnected nature of the European pipeline structure, some of the gas from the new pipeline will likely be shipped to other EU member states closely connected to the German grid. Arguably, Nord Stream 2 could even improve European energy security. Assuming that European gas demand remains relatively constant, the increased flows through Nord Stream 2 could reduce transit through Ukrainian channels and reduce any risk to European supply caused by further disputes between Russia and Ukraine.

Poland, however, takes a very different view of the situation, as do Estonia, Latvia and Lithuania. Polish President Andrej Duda called Germany's increased reliance on Russia a, "huge threat", and Estonian Foreign Minister Sven Mikser said it was, "in contradiction with the principles of the EU's energy policy" and could give Russia leverage, "to intervene in European politics" (Noack, 2018). The US has sided with the Eastern European allies on this issue and in 2018 President Trump caused a diplomatic furor when he described Germany as, "captive to Russia", because of its energy dependence (Korte, 2018). But American officials continued to press the point, and US Secretary of Energy Rick Perry stated in 2019 that Nord Stream 2 would, "undermine European energy security" (Perry, 2019). This concern over Nord Stream 2 was not limited to the executive branch, and in a more substantive bipartisan move the United States' Congress imposed economic sanctions through the National Defense Authorization in December 2019 on companies working on the pipeline project, causing the Swiss company working on the final sections of the project to suspend operations (Elliott, 2019; Ellyatt, 2019). This move, in turn, sparked indignation in Germany and the EU over what European officials argue is undue interference in an internal matter (Germany, EU Fume, 2019). The new pipeline would, of course, allow Russia to export gas without transiting Ukraine, which would deny the Ukrainian government billions of dollars in transit fee revenue (Chow, 2017, p. 4). But that is a separate issue from the concerns evidenced by American and Eastern European officials who stress the vulnerability to the EU opened by this increased energy dependence on Russia.

Thus, there is a curious paradox at work: even though Europe is in a far better position regarding its energy security today compared to 2010, the issue is still highly divisive at times between members of the EU and between certain EU members and the US. Much of Europe's improved energy security can be attributed to actions taken by the EU. The disruptions that occurred in 2006 and 2009 prompted a reconsideration of the European energy security situation at the EU level and led to the drafting of several strategic documents. The most recent significant iteration regarding Russia is the 2014 European Energy Security Strategy (ESS). The ESS focuses on a range of energy-related issues including climate change and the role of renewable energy, but an obvious factor is the role of Russia as the predominant gas supplier to Europe. The opening paragraphs of the document state that, "in the winters of 2006 and 2009, temporary disruptions of gas supplies strongly hit EU citizens in some of the eastern Member States. This was a stark 'wake-up call' pointing to the need for a common European energy policy". The European Commission's press release on the ESS emphasizes that it is based on stress tests that took into account scenarios involving a complete halt of Russian gas exports to Europe for a period of one to six months (Communication from the Commission, 2015). The EU takes a relatively market-oriented approach to ensuring energy security across the continent, but certain actions taken at the EU level have increased Europe's energy security against Russian disruptions. The most significant move was to ensure that pipelines in Europe can flow west-east as well as east-west. In 2006 and 2009 this was not the case and gas could only go from east to west, but it was in fact the Eastern members of the EU that were most threatened by Russia's actions. Even if there was an abundance of gas in Western Europe, it was not possible to move it through the existing infrastructure to the Eastern member states. Today gas in Germany, the Netherlands or France could flow east if needed to fill demand in Bulgaria, Poland or the Baltic States.

This ability to move gas bidirectionally is particularly relevant to the injection of LNG into the European energy mix. The states most concerned about Russia's reliability as a supplier have constructed LNG import facilities, and Poland and the Baltic states have new LNG facilities that could supply a significant amount of their energy needs in the event of a reduction from Russian sources (Georges, 2018). The completion of the Swinoujscie LNG Terminal in Poland, the Klaipeda terminal in Lithuania, the Finland-Estonia Interconnector, and the bidirectional Poland-Lithuania pipeline have increased gas flows throughout Central and Eastern Europe. Changes in the Austrian gas network connect the Czech Republic, Slovakia and Poland to western European gas supplies. There are now reverse flow plans from Germany to the Czech Republic and Poland, and the existing pipeline infrastructure can now manage reverse flows to Ukraine (Harrison & Princova, 2015). As a result of these alterations in the pipeline networks, there is a truly integrated gas market across Europe and gas prices have converged between Western and Eastern Europe (Harrison & Princova, 2015).

These changes in the gas network take on a particular significance when combined with the large amount of underutilized LNG import capacity in a number of Western European countries, particularly Spain and France. In combination with the relatively new ability of pipelines to move gas bidirectionally, this underused capacity could play a major role in the energy supply and energy security of Europe in the event of a crisis that reduces or halts Russian gas exports. LNG tankers offloading in Western Europe could inject new supply into the system that could flow to the most vulnerable members of the EU, something that could not have occurred during the previous gas crises.

Russia attempted to exploit its position as the dominant supplier of energy to Europe in 2006 and 2009 but doing so raised threat perceptions in Europe with long-term consequences for Russia's ability to leverage European energy dependence for its political goals. The changes in the European gas transport network, often planned and funded with EU assistance, allow for supply diversification and transport flexibility that render Europe far more integrated in gas markets and less vulnerable to supply disruptions from Russia. It should be stressed that this is a critical point of economic and security integration, and European Union institutions played a major role in this transformation. In particular, it was the European Commission that implemented the stress tests on the gas transit system to identify problems in infrastructure, and created regional infrastructure roadmaps that led to specific improvements and means of supply diversification. The end result is that Europe is far more secure in its energy supply, but a significant and growing part of that improved situation is closely related to the surge in American gas production and export.

## The US gas boom and its effects on global markets

The rapid growth in US gas production since 2015 is extraordinary by any measure. Although hydraulic fracturing is not new, advancements in applying that technology and rapidly declining costs associated with this non-traditional technique sparked a boom in US gas production that is unlikely to fade in the near term (see Figure 1). A significant portion of the gas extracted in the United States is used in North America, but the huge growth in supply has generated investment in LNG export facilities along the Gulf Coast of the US. In 2019 the US was the largest producer of natural gas in the world

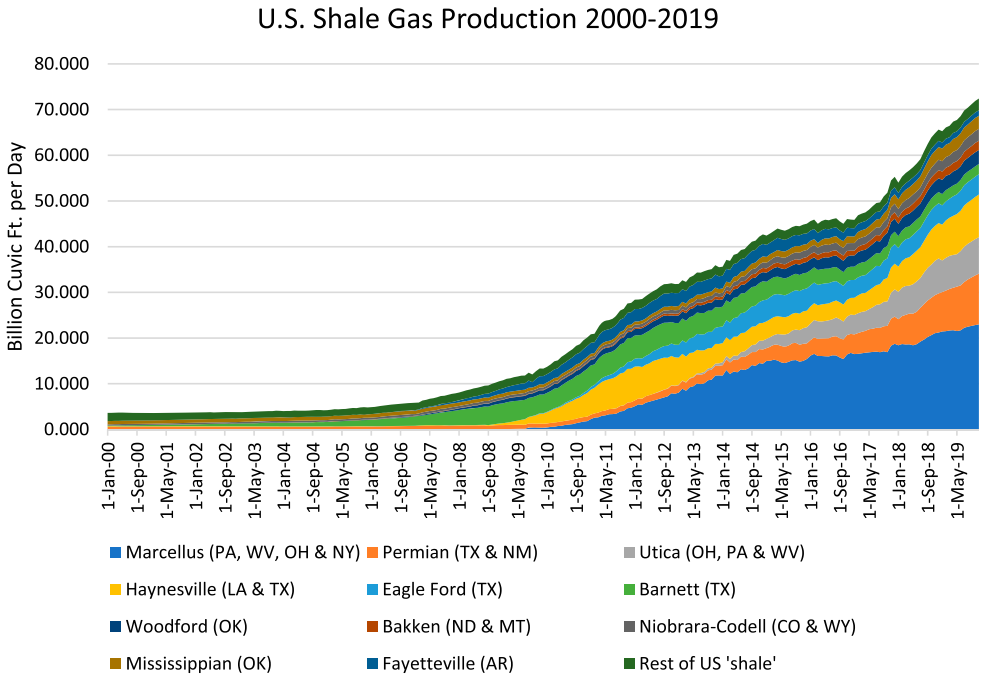


**Figure 1.** Growth in American Shale Gas Production. Source: US Energy Information Agency.

and one of the largest exporters, second only to Qatar (Paraskova, 2019). The US exported an average of 4.8 billion cubic feet (BCF) per day in 2019, and that is projected to increase to 6.9 BCF per day in 2020 (195 million cubic metres) (US LNG Exports, 2019).[1] Baring a major global recession or other event that weakens energy demand and drives the price of gas to sustained historic lows, the US is slated to be among the top exporters of gas in the world for years to come.[2] The question, remains, however, can this be used to promote American strategic interests, particularly in terms of ensuring European energy security and weakening Russian influence over Europe? US officials often speak in these terms. In May 2019 Under Secretary of Energy Mark W. Menezes said that, "increasing export capacity from the Freeport LNG project is critical to spreading freedom gas throughout the world by giving America's allies a diverse and affordable source of clean energy" (Mufson, 2019). Other US officials speak to the specific effects on Europe and how American gas exports can reduce dependence on Russia, despite the price differential between Russian gas and American LNG. As Dan Brouillette, Deputy Secretary of the Department of Energy said during a 2018 meeting in Denmark, "What price freedom? That's an important concept. We're talking energy security and not so much economics here" (Shiryaevskaya & Krukowska, 2018).

This drive to reduce Russian leverage in Europe and elsewhere fits with the current US National Security Strategy that specifically names Russia as a strategic competitor (National Security Strategy, 2017). Despite the rhetoric of President Trump that often appears to downplay the US strategic interest in Europe and the American commitment to its allies, the current administration has actually increased the US deterrent presence in Europe. It augmented an Obama-era policy of reassurance in Poland and the Baltic states,

increased training activities in the region, and demonstrated the ability of the US military to move heavy armored vehicles rapidly to the region in the largest exercise of its kind since the Cold War (Schmitt, 2018; Sprenger, 2018). It also stepped up military aid to Ukraine to include weapons such as the Javelin anti-tank system and built a maritime operations centre on the Ukrainian Black Sea coast close to the main Russia naval base in Crimea (Bowen, 2017; Seabees Break Ground, 2017). The National Security Strategy specifically focuses on Russian energy production as a tool of its influence in Europe and on the strategic importance to the United States of reducing the leverage that Russia could theoretically employ through its gas exports (National Security Strategy, 2017, p. 38). Even more directly to the point, US Secretary of Energy Rick Perry bluntly stated in 2019 that, "Russian gas can and should remain part Europe's energy mix. But our goal is to support European efforts to minimize dependency on any one supplier and the ability of that supplier to use this leverage for political advantage" (Perry, 2019). The Trump administration's more confrontational tone on long-stranding American complaints in the US-EU trade relationship may alienate some potential consumers of US LNG in Europe, but the two sides remain each other's most significant trade partners and energy may become a larger part of the relationship.

Using American energy production to blunt Russian influence is a clear security priority of the US, but it is one that is difficult to put into effect as a tool of government policy. Unlike Russia where gas companies are closely tied to the government and can serve as a tool of state policy, US gas production is entirely in private hands and driven by market forces. The US government can encourage or discourage gas development through taxes and regulation, and the current administration has taken steps on the regulatory front to enable the rapid growth in US gas production and export. But the US government cannot direct where and when gas is sold, and most American LNG is exported to Asia and Latin America for the simple reason that this is where it finds the highest price. The costs associated with cooling the gas into liquid form, shipping, and regassification at the destination mean that US producers must secure a price of $6-7 per million British Thermal Unit (mBTU) to be profitable. Russian gas is marginally profitable at $5 per mBTU (1 mBTU = 28.5 cubic metres) (Why America Struggles, 2018). Where existing pipelines can bring cheaper Russian gas, US LNG is not commercially viable. Thus, US LNG flows to higher-cost markets in Asia and Latin America that depend on LNG from a variety of sources. That said, however, there is a considerable amount of variability depending on demand and the spot price. For example, less than 10% of US LNG exports went to Europe in September 2018, but that jumped to more than 40% in January 2019 as a cold winter increased demand for gas in Europe compared to China, which was experiencing a relatively mild winter (Kravtsova & Zawadzki, 2019). As demand in Asia slows and the spot price in Asia declines, US LNG exports tend to shift toward Europe where the lower average transportation cost from the US makes Europe a preferred destination for US suppliers even though the LNG would still bring a higher nominal price in Asia (U.S. LNG exports to Europe, 2019). The surge in US LNG exports to Europe in late 2019 may not be a long-term trend, but it demonstrates the ability of US LNG producers and exporters to rapidly respond to price shifts, and for European LNG terminals to manage the additional volume.

Russia will likely retain its position as the main supplier of gas to Europe, but the US gas boom has a twofold effect that weakens the Russian position and ability to exploit that

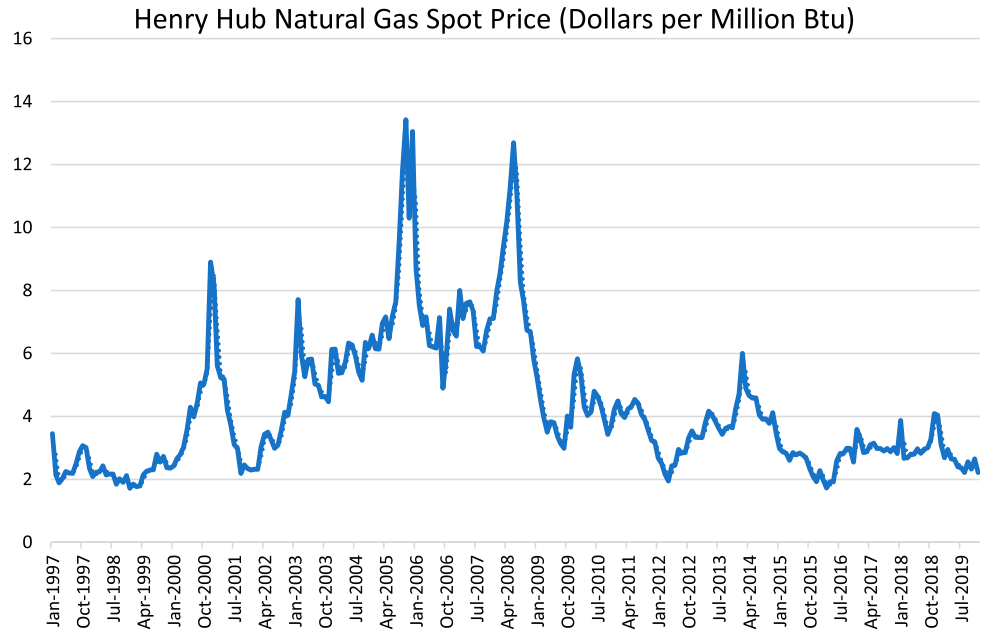


**Figure 2.** Natural Gas Spot Price, 1997–2019. Source: US Energy Information Agency.

relative dependence. First, US gas exports are a significant factor in keeping global gas prices at low levels. Natural gas prices in 2019 were lower than previous years and no change is expected in 2020 (see Figure 2). In addition, the increase in LNG in the global market has changed the pricing mechanism for gas. Instead of binding the price of gas to the price of oil in long-term contracts, gas is now mainly traded on the spot market (O'Sullivan, 2017). The end result is that pricing power has shifted away from Russia, and the price in the various spot markets around the world is considerably lower than what it was only a few years before. Given that Russia is highly dependent on gas and oil exports for its export earnings, and that Russian gas company Gazprom is, in the words of Dimitri Trenin, something of a "piggybank for the Kremlin", the mere existence of a large volume of US gas in the international market has a limiting effect on Russia, and deprives it of hard currency earnings that could be used to finance a range of activities that run counter to European security interests (Aron, 2006).

The second effect is that there is a distinct limit to how much Russia can manipulate the price or supply of gas for political purposes. As mentioned above, the difference in the price at which US LNG and Russian gas is marginally profitable is approximately $1 per mBTU. If Russian gas companies raise prices by any amount close to $1 per mBTU, more LNG will flow to Europe, especially from Persian Gulf producers that can export at a lower price than US LNG producers. With a rise in price above the $1 per mBTU threshold, US LNG becomes highly competitive and, given the rapid decrease in US production costs, this difference is likely to become smaller over time. Raising prices or cutting supply would not have the same impact as it did in 2006 or 2009, and Russian producers would lose market share.

This limiting effect on Russia is made possible by the EU effort to ensure that gas networks can push gas in both directions. LNG tankers docking in ports in Spain and

France where there is underused capacity could have their cargo injected into the supply chain and free up supply to reach customers in Eastern Europe who are normally dependent on Russia for gas. The end result is a taming of Russia to behave as a normal supplier because there is no other choice that does not do long term harm to its interests. US LNG may not be the largest part of the energy supply of Europe now or even in the near future, but it has a number of significant effects that greatly enhance European energy security.

## Is this Enough? Considering low probability/high impact scenarios

The above discussion assumes that the relationship between Russia and Europe remains stable and that nothing occurs to fundamentally disrupt trade. Because of the dynamics outlined above, the market-based approach to energy security adopted by the EU should be sufficient for almost any scenario. But any energy strategy must also take into account low-probability/high impact events and seek to minimize their consequences in a financially responsible manner. The most extreme scenario would factor in events that would completely disrupt the gas flow from Russia on short notice. The European Energy Security Strategy, in fact, attempts to mitigate the effects of a cutoff of Russian gas lasting one to six months. This would only come into play in the event of escalating conflict between Russia and NATO but, given the events of the past few years, it would be prudent to test any energy strategy against this unlikely hypothetical condition.

In 2015, planners at the RAND corporation conducted a wargame that involved a full-scale Russian military assault on Estonia and Latvia. NATO forces came out badly in the exercise, as the forward-based forces were quickly overwhelmed and resupply was effectively prevented by Russian mobile anti-aircraft and anti-ship missiles (Shlapak & Johnson, 2016). As a result, NATO's military presence in the Baltic states has been enhanced through the European Reassurance Initiative which adds a significant deterrent presence on the ground from the US, Germany and the UK in partnership with their Baltic allies (Schmitt, 2018). Such a direct military confrontation would clearly lead to a gas supply disruption, but there are many other scenarios below the level of full-scale combat that could also impact gas supply, and here what might be called the Narva scenario comes into play. Narva is an eastern Estonian city on the border with Russia with a majority ethnic Russian population. What would happen if Russia attempted to engage in similar activities as it did in Ukraine, but this time fundamentally challenging the security guarantees of NATO and the EU? It does not take much inventiveness to conceive of a situation where ethnic Russians in a town like Narva protest their perceived treatment by the Estonian government and Russian covert agents acting as provocateurs in the crowd instigate violence. The protests led by those agents then focus on taking control of a section of the border and pre-positioned Russian "volunteers" stream across to help their ethnic brethren. With their armed presence, ethnic Russians declare a part of Estonia to be a new sovereign state, which is quickly recognized by Russia. Such a series of events would bring into question the reliability of NATO. The alliance would be faced with a stark choice: either abandon an exposed member of the alliance or engage in operations that could lead to a violent conflict with Russia.

Such an event could lead to a complete cessation of gas exports from Russia with little or no warning. Under this extreme set of circumstances, market-based solutions would potentially leave a significant gap between the cutoff event and when substitute LNG

supplies could reach Europe. Although it is true that the resulting demand for gas would raise prices in Europe and supply would redirect itself there without government intervention, it would not happen immediately. Supply could be rapidly increased in the Persian Gulf states where excess capacity lies dormant, and in the US where gas producers respond quickly to price shifts. But even if production rapidly increases, bottlenecks would likely emerge in shipping. LNG tankers would have already been contracted to carry their cargoes to terminals in Asia and Latin America and would not be available to transport gas to Europe until those deliveries are completed. A sudden spike in the demand for LNG in Europe could require additional tankers to meet that demand, particularly if that demand peaks when both Europe and Asia are experiencing cold weather.

Given the current capacity of LNG ships, approximately an additional four tankers offloading in European terminals per day would make up for the shortfall in the event of complete cutoff of Russian gas.[3] This assumes that no additional gas would be coming through pipelines from Norway and Algeria. Some, perhaps a considerable amount, of the shortfall could be made up through those suppliers, so four tankers per day is a maximum estimate based on an extreme scenario. In addition, existing storage facilities could be expanded to provide an additional cushion in the event of an unanticipated cutoff. Thus, a solution to an extreme scenario can be envisioned with a handful of additional tanker dockings per day over a wide range of LNG ports across Europe where there is excess unused capacity. LNG tankers are, of course, huge ships costing approximately 230 million dollars to build, and no shipping company can afford to leave such vessels underused for long periods of time. Thus, the solution would be to increase potential storage in the EU to manage, at most, an additional 4 tanker loads per day for the weeks needed for production to increase and for supply to re-route to Europe. This could minimize the impact of a Russian supply disruption and allow for a switch to more a more LNG-based supply chain. In short, the gas is available, and producers have the ability meet increased demand from Europe in a brief period of time; the evidence is the jump in LNG imports into Europe that took place in the winter of 2019. The difference in this extreme scenario is one of scale that could be managed with a moderate increase in gas storage capacity.

Another means of reducing Europe's potential vulnerability is to minimize European dependence on gas imports altogether. The European Energy Strategy speaks to this point and increased investments in solar and wind power across Europe could make the EU less reliant on natural gas as a fuel source, as could new nuclear power plant construction, or "clean coal" technology. All of these options, however, are unlikely to yield substantial changes in the European energy supply mix in the near to medium term. Despite significant investments in solar and wind power, these forms of power generation meet only a small percentage of the total energy needs of Europe and at a significantly higher cost (Shellenberger, 2019). More importantly, they cannot be relied upon by themselves because the power must be used when it is generated and demand does not necessarily coincide with the times in which the sun is shining or the wind is blowing with sufficient force to generate the necessary power. As such, all solar and wind facilities must be backed up by more traditional forms of power generation, often gas (Barber, 2016). A technological breakthrough that allows for the efficient mass storage of solar and wind-generated power would truly change the global energy market, and potentially allow for a considerable reduction in the use of natural gas in the energy supply mixture. A

considerable amount of investment and effort is being devoted to improving the efficiency and storage of solar and wind energy. Despite some progress, however, there is no indication that such a technological breakthrough is imminent. None of this is to diminish the importance of continuing to explore means to increase the use of renewable fuels in Europe and elsewhere, but merely to underscore that for the foreseeable future natural gas will likely remain a critical component of electricity generation in Europe.

Nuclear power and coal-fired power plants could also reduce the need to import gas into Europe, but neither are likely candidates for expansion. Nuclear power plays a major role in providing for France's electricity needs as well as several other EU member states, but it is politically unpopular and seen as a distinct liability. In the wake of the Fukushima nuclear power plant disaster in 2015, Germany quickly moved to shut its remaining nuclear facilities and, while Finland and Hungary continue to invest in nuclear projects, it is unlikely that other EU members will construct new nuclear facilities. Coal is of course the form of power generation with the highest levels of environmental externalities, and its obvious drawbacks render it unpalatable in the current political environment. So-called "clean coal" technology makes the burning of coal far less damaging to the environment than previously, but it is still a relatively dirty form of power generation, particularly considering the variants of coal commonly mined in Europe. For the foreseeable future, therefore, natural gas will remain a significant part of the European energy mix. Any further measures taken to ensure European energy security against low probability/high impact scenarios will primarily involve gas and LNG in particular.

## Conclusion

The energy security situation in Europe is vastly improved compared to the mid-2000s when concerns about energy security prompted a range of actions. But it was precisely the response to those warning signs that created the more secure position Europe enjoys today. The improvement is a result of concerted planning and action on the part of the EU and national governments in Europe, as well as US gas production that serves as an important underwriter of Europe's energy security. In short, it is an example of the EU successfully implementing an important strategy to improve energy security in Europe, and an example of transatlantic cooperation based on common security goals. When combined with the emergence of the US as one of the largest exporters of natural gas in the world for years to come, Europe's position is even stronger relative to that of Russia. It can afford to be reliant on Russia for the plurality of its imported gas because the additional supply of LNG in the global market provided by the United States forces Russia to behave as a normal commercial partner. On a broader scale, the huge increase in global gas production has driven down prices and limited the funding the Russian government has to engage in behaviour that could destabilize European security or damage European interests.

Despite this, energy imports from Russia remain a point of disharmony both within the EU and in the transatlantic relationship. Yet, this dispute is both unnecessary and counterproductive in the context of the broader transatlantic relationship and the common goal of both the EU and NATO to minimize Russian interference in European affairs. A combination of moves by the EU, the American gas industry, and national governments on both sides of the Atlantic led to vast improvements in European energy security. It is by and

large a success story and one of noteworthy transatlantic cooperation, particularly in a period of relatively strained transatlantic relations. There is little need for the United States to argue with Germany over Nord Stream 2, or for Germany to quarrel with its eastern neighbours on this issue. German reliance on Russia gas will undoubtedly increase with the opening of the new pipeline, but that dependence is unlikely to result in increased Russian leverage over Germany or the EU in general. There is also little justification for the harsh exchanges between Germany and Italy on the one hand, and the Central and Eastern European states that view their increased gas imports as a form of disloyalty to the European ideals. Ironically, this divisiveness over energy issues can only strengthen Russia's hand in Europe, as a significant long-term goal of Russian foreign policy is to weaken the transatlantic link as well as EU member state solidarity. Instead, NATO and EU member states should appreciate the improved energy security situation in Europe and better understand how the combination of factors the led to it can be leveraged to neutralize Russia's ability to use energy supply as a tool of foreign policy, as well as ensure European energy supply against even the most extreme supply crisis scenarios.

## Notes

1. Unleashing US natural gas reserves through hydraulic fracturing raised environmental concerns about water contamination, seismic activity and excessive water use. Large scale studies at the federal and state level aliviated some of those concerns and validated others. In the most high-profile case where fracking was suspected of being responsible for groundwater contamination, a lengthy study found that the cause was an unrelated bacterial infection (Gruver, 2016). But the Environmental Protection Agency found other cases of improper dumping of fracking wastewater that led to groundwater issues (*Hydraulic Fracturing*, 2016). The disposal of wastewater is also linked to increased seismic activity in regions that typically have a limited history of earthquakes (Skoumal, Ries, Brudzin, Barbour, & Currie, 2018). In addition, fracking uses large amounts of water that can deplete the amount of water available for agriculture or other activities in regions where water is less plentiful. In short, the environmental impact of fracking relative to conventional gas drilling is potentially higher unless care is taken to properly manage the water used in the process and the management of the wastewater.
2. The pandemic of 2020 appears to be such an incident and at the time of this writing the outcome is unknown. However, the rapid recovery of stock markets indicates investor confidence in a broad and sharp economic recovery.
3. A modern tanker can carry 3 billion cubic feet of gas. 1 $m^3$ = 35.3 cubic feet. Annual demand was 458 million cubic meters. https://www.statista.com/statistics/265406/natural-gas-consumption-in-the-eu-in-cubic-meters/.

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No potential conflict of interest was reported by the author(s).

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