

GAS GEOECONOMICS IN EUROPE

Using Strategic Investments to Promote Market Liberalization, Counterbalance Russian Revanchism, and Enhance European Energy Security

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"Gas Geoeconomics in Europe: Using Strategic Investments to Promote Market Liberalization, Counterbalance Russian Revanchism, and Enhance European Energy Security"

Introduction

“We agree that Russian gas can and should remain a part of the diversified energy mix for Europe, but our priority is helping Europe minimize dependency on any one single supplier, and really working towards diversification that will support energy security.”

—The Honorable Mary Burce Warlick, Acting US Special Envoy for International Energy Affairs (June 2017)¹

Many European leaders recognize the strategic imperative to hedge against the risk that Moscow could use Russian gas as a tool to co-opt—and, in some cases, coerce—key political and private sector actors. Yet many countries in Europe have not been able to fully capitalize on increasingly ample gas supplies, seize the opportunity to liberalize their gas markets, and, by doing so, more fully assure gas supply security.

As Thierry Bros of the Oxford Institute for Energy Studies states, “A sort of schizophrenia exists between Europe’s diplomacy and its market. The market chooses the cheapest gas to produce and use in Europe, which is Russian gas. Europe is said to be too dependent but nothing has been done to change this.”² The issue is complex. First, European gas purchasers are not governments but commercial enterprises. Particularly in Western Europe, their decisions are driven by upfront economic costs and long-established commercial relationships with Russia. Not surprisingly, these importers are more likely to overlook Gazprom’s periodic role as an instrument through which the Kremlin concurrently exercises economic and political influence in some Central and Eastern European countries that have historically depended heavily on Russian gas.³

Second, Europe has pockets of liberalized gas trade—for instance, near the NBP and TTF hubs in Northwest Europe—but there is nothing continent-wide akin to the marketplace that exists in the US, for example. In particular, natural gas markets in Central and Eastern Europe (CEE) exhibit high levels of state control that governments justify on the basis of energy security considerations, usually related to Russia’s use

of energy supplies as a geopolitical tool. Lately, CEE governments have been much more focused on diversifying energy supplies, often effectively putting liberalization on the back burner.⁴ This omission matters because a well-supplied, liberalized gas market would provide a much better tool to ensure energy security and a powerful antidote to attempts by any supplier—even a large one like Russia—to use gas as a coercive or corrupting instrument.

Markets are incredibly adaptive and generally offer the best mechanism for responding to an acute energy supply crisis. However, markets also typically struggle to anticipate and allocate funding for (1) preemptive security responses or (2) responses to malign actions by the lowest-cost supplier of a key commodity; especially if the manipulations are not generally increasing the price of the commodity and the response requires the construction of institutional and physical infrastructure. In such cases, state-level funding and regulatory influence that “nudges” along the creation of infrastructure in key zones may provide a more effective policy response.

This paper seeks to spark a deeper conversation on the merits of geoeconomics—i.e., using “economic instruments to produce beneficial geopolitical results”⁵—as a potential source of new and scalable policy options for the US, as well as the EU and its individual member states, to bolster gas supply and national security across Europe. A gas geoeconomics approach could help address two core problems currently hamstringing a more comprehensive European approach to gas supply security:

1. Why would a private commercial entity pay for gas infrastructure intended to deal with broader national—and continental—security concerns?
2. How can policymakers potentially incentivize national decision-makers and monopoly gas distribution service providers in Europe to facilitate more rapid gas market liberalization?

We envision US-funded investments in strategic gas import infrastructure as a way to help surmount the barriers currently posed by local political-economic structures, friction between national security and commercial priorities, and the EU’s lack of authority to effectively and directly impose gas market reforms within member states. In a fully liberalized gas market environment, private capital would flow toward infrastructure opportunities that ultimately would help reduce Russia’s ability to use gas supplies as a coercive tool. But at present—particularly in the parts of Europe most vulnerable to Russian energy coercion—monopoly gas service providers and a lack of market liberalization effectively shut out private funds. The US government would find it neither financially nor politically sustainable to act as the sole or prime funder of strategic gas infrastructure in Europe. **Accordingly, the US financial backing we propose would be intended to facilitate the removal of barriers that currently repel private investment. Such funds would be most accurately thought of as “jump-start money” that can hopefully break through barriers and be multiplied by follow-on private investments.**⁶

What's more, our proposed targeted deployment of financial assets would be consistent with the current intensification of US energy diplomacy vis-à-vis Europe. Financial support would be contingent upon recipient countries taking concrete actions to foster gas market liberalization, including regulatory reforms, unbundling of production and transmission infrastructure, and codifying third-party access to pipeline capacity. This proposal is admittedly unorthodox, but we hope it will not only offer a set of near-term actionable ideas, but also stimulate the formulation of new ones and elevate the conversation on the critical topic of European gas and energy security.

The unconventional gas revolution offers the chance to rethink how the US applies power in Europe

Over the past 25 years, the US has frequently deployed its financial power reactively in the form of sanctions, at times with the intention of effecting change without resorting to military intervention. Yet in cases where more than mere political “signaling” is needed, sanctions have often proved insufficient to decisively influence the behavior of countries like Russia. A more thoughtful use of geoeconomics to achieve foreign policy objectives could be a tool that supports US sanctions and discourages military conflict while facilitating traditional goals of US diplomacy.

The US State Department's Bureau of Energy Resources (BER) has, for the past several years, engaged in significant energy diplomacy in Europe, “[working] with our allies... to support their efforts on energy diversification of fuel types, source countries, and delivery routes” and conducting these efforts as part of a larger global focus on “market-based energy solutions.”⁷ The US government has also displayed a limited willingness to fund efforts that signal support for the construction of new gas supply routes in Europe—such as a \$956,000 grant the US Trade and Development Agency awarded in 2015 for a feasibility study of Romanian state-owned firm Transgaz S.A.'s proposed pipeline expansion project in Romania.⁸ But the bully pulpit alone may prove insufficient to catalyze necessary changes in a timely manner, particularly if energy diplomacy efforts move less decisively than Russian efforts to sow discord within Europe, and between Washington and its European partners.

In this context, strategic pockets of catalytic financial support might be tied to a broader pro-liberalization policy in order to complement the EU's existing gas market policies. This, in turn, could help expedite the development of a truly competitive continent-wide natural gas marketplace in Europe. Market liberalization is rooted in the reality that deeper and more liquid markets “provide greater opportunities to trade thereby reducing the impact of unexpected market disturbances on the supply portfolio.”⁹ Creating a liberalized gas market requires significant political will and regulatory reforms, which is where diplomacy arguably matters most. But liberalization also requires the infrastructure for market participants to move molecules between

sources of supply, storage, and demand centers in response to market forces. Herein lie the advantages that could be realized through a gas geoeconomics strategy that couples traditional diplomacy with the actual deployment of significant financial incentives for accelerating market liberalization.

Geoeconomic investments should leverage seaborne gas supplies.

Adding new gas import channels that boost European gas supplies and connectivity would further shield European consumers from the potential Russian use of gas as an “energy weapon.” This strategy is cost-effective and complies with EU energy law. Also, if successful, it could potentially reduce Russian gas sector revenues, thus diminishing the pool of resources the Kremlin could otherwise use to fund destabilizing activities in Europe and further afield.¹⁰

Lately, Central and Eastern Europe (CEE) governments have been much more focused on diversifying energy supplies, often effectively putting liberalization on the back burner. This omission matters because a well-supplied, liberalized gas market would provide a much better tool to ensure energy security and a powerful antidote to attempts by any supplier—even a large one like Russia—to use gas as a coercive or corrupting instrument.

Opening more channels for alternative gas supplies to reach Europe would pose what Ken Medlock calls “a credible threat so dramatic that it could force a recalculation of all future Russian foreign policy moves vis-à-vis its western neighbors.”¹¹ Neither sanctions nor the gradually increasing NATO military presence in Eastern and Central Europe have so far been able to achieve such a recalibration on their own. Adding market forces amplified by strategic gas infrastructure investments as part of a broader containment and deterrence package could begin to more decisively influence Russian actions.

New infrastructure investments would capitalize on the growing global diversification of gas supplies and increasing availability of tradable seaborne LNG shipments. Data from Tellurian, an export-focused liquefied natural gas (LNG) project developer on the US Gulf

Coast, suggest that by 2020, the amount of gas loaded daily onto LNG tankers for seaborne transport could exceed the 2016 total daily gas production of Russia—the world’s second largest gas producer.¹² An increasing proportion of this seaborne gas is explicitly tradable and not tied to a specific destination. Boosting consumers’ access to the fungible and liquid LNG market—particularly in CEE—will help insulate Europe from coercion by any one single natural gas supplier.

Given the localization and setup of existing infrastructure and spheres of influence in addition to dependence on Russian gas within the EU, we view the Iberian Peninsula, Baltic Sea, and Adriatic Sea regions as key zones for new inbound pipeline and LNG regasification infrastructure (Figure 1). Gas markets in these zones are, generally speaking, much less integrated than those in Northwest Europe. Recent research from the Oxford Institute for Energy Studies notes that “the Polish and Spanish gas markets are not yet fully integrated with their neighboring markets,” and that “arbitrage forces are still not fully operating between the Italian PSV and the connected hubs.”¹³

Figure 1. Priority Zones for Goeconomic Gas Investments



Dependence on Russian gas



● Existing LNG terminals

Priority Zones

- | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <p>1 Boosting Baltic Sea LNG import capacity and enhancing pipeline connectivity, including north/south between Poland and its neighbors</p> | <p>2 Improving connectivity between Spain and the rest of Europe</p> | <p>3 Boosting Adriatic Sea LNG capacity and local connectivity into the Balkans and Greece</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|

Sources: BP Statistical Review of World Energy, GADM, Gas Infrastructure Europe, Gazprom

Gas trade is even less liberalized in the Baltics, the Balkans, and countries surrounding the Adriatic. Given that many of these markets are relatively small, highly dependent on Russian gas imports, and thus far lack diverse supply options, the strategic returns on gas geoeconomic investments could be high. For the Baltic region in particular, expanding reverse flow capacity between countries and investing in greater LNG import capacity could better tie these markets to Central Europe, diversifying supply options for both locales in the process.

Northwest Europe (including the UK) is already amply served by pipeline and LNG offtake infrastructure and hosts Europe's highest liquidity spot markets for gas. As such, geoeconomics-focused gas infrastructure investments in that region would not yield the types of benefits likely to accrue from investing in the areas shown in Figure 1, which tend to be less liberalized and have a lower degree of access to gas supplies from multiple producers.

What gas security initiatives has the EU taken to date, and how could US-backed investments mesh with these?

The European Union already invests in energy supply “projects of common interest” through the Connecting Europe Facility (CEF).¹⁴ The CEF aims to help fund projects that would match future demand for energy, ensure supply security, and/or support the deployment of renewables.¹⁵ Yet the CEF is severely underfunded relative to the continent's energy infrastructure investment needs, and only has about 892 million euros per year of committed investment between now and 2020 for both gas and electricity infrastructure projects. US financial support—whether through direct fund transfers, loans, subsidized debt, or another means of underwriting—could turbocharge the CEF.¹⁶

On the gas front, the CEF has been most active in supporting reverse flow projects that improve connectivity within the European gas market. In contrast, US-backed investments would focus primarily on increasing the net amount of gas that can be imported into the EU from an array of global sources. This could take the form of projects that boost pipeline capacity between Spain, France, and other portions of Europe and augment LNG import capacity, particularly in Southern and Eastern Europe, where current dependence on Russian gas is often extremely high. As such, the types of infrastructure projects we propose that the US government help finance are complementary to the ongoing EU-led investment program.

For instance, gas geoeconomics project funding could underwrite pipelines that improve Spain's connectivity with the broader European gas market and load-balancing storage to harness the roughly 33 billion cubic meters per year of LNG regas capacity that sits unused on the Iberian Peninsula, even on peak demand days. This volume of gas is equal to the entire annual consumption of the Netherlands in 2016.¹⁷ Spain currently has only two pipeline connections that allow gas to flow across the French border into the broader European marketplace: Larrau and Biriadou, which can only move about 7 billion cubic meters per year (less than a quarter of the available "spare" regas capacity on the Spanish coast).¹⁸

Likewise, the advent of floating storage and regasification units (FSRUs) for importing LNG opens an avenue for potential gas supply projects investments that would allow Washington to rapidly—and more cost-effectively—underwrite game-changing gas supply investments.

US involvement could potentially help surmount political resistance to market liberalization in Central and Eastern Europe.

Key US partners—particularly in Central and Eastern Europe—are likely to welcome a more assertive, financially backed US gas diplomacy approach. For instance, former Polish Minister of Foreign Affairs Witold Waszczykowski stated in September 2017 that Poland is "aiming for ... the ability to import natural gas from other directions, ones that are politically safe, and which will not expose us to any political and instrumental actions by Russia."¹⁹ He even posed the possibility that Poland could re-export natural gas imported from the US "if the US offers competitive prices."²⁰ Likewise, when Lithuania inaugurated the Klaipėda LNG Terminal in October 2014, President of Lithuania Dalia Grybauskaitė noted that "From now on, nobody will dictate us the price for gas—or buy our political will."²¹

Supply diversification should occur in tandem with gas market liberalization.

While top political leaders and officials handling gas security issues in Central and Eastern European countries broadly support the diversification of gas imports in general, domestic firms' willingness to facilitate gas market liberalization—which undermines their long-held monopolistic positions—remains less clear. More LNG imports are welcome when they displace Gazprom's supply monopoly. But the same local monopoly that welcomes imported LNG may be much more resistant to gas market liberalization that subjects its own longstanding privileged position to competition.

The process of gas market liberalization in Poland and other countries faces potential political complications, especially as relations between some CEE countries and EU authorities in Brussels have recently worsened.²² These politics matter because Brussels lacks the regulatory authority to coerce compliance with its policy directives.

Furthermore, corporate actors in Europe with monopolies or quasi-monopolies on gas import, transmission, and distribution infrastructure also may not be as enthusiastic about full market liberalization as they are about procuring access to alternative supplies that remain under their exclusive control.

We recognize that as structured, our proposal ties financial support for infrastructure to concrete steps toward liberalization. Such conditionality, coupled with an insistence on accountability in measuring progress, may be politically contentious in some countries. If that is the case, the investments would make less sense, as the capital deployments' core purpose is to help build the physical structures needed to help diversify gas sourcing and transport molecules in a reformed regulatory environment. Yet overall, the deteriorating relationship between Russia and a number of NATO and EU members is likely to make targeted US-backed gas infrastructure investments increasingly appealing to domestic political audiences despite the conditionality attached to them. And on a more positive note, many of the same parties experiencing conflict with Brussels have more constructive relationships with the US. Accordingly, if Washington includes domestic gas market reform as part of its broader geoeconomic approach, it could complement existing EU efforts by offering its own—perhaps more politically palatable—persuasion and funds.

Mitigating the Risk of Market Distortion

The fact that Europe's energy demand corridors and industrial clusters have been well-established for decades substantially reduces the risk that US government-backed gas infrastructure investments would adversely distort the geospatial orientation of gas market development. The risk of misjudging future growth corridors and making suboptimal infrastructure placements is much lower in Europe than it is in contemporary China, for instance, where ongoing and relatively rapid development makes it difficult to predict the best energy delivery routes and options.

Europe is also a much more mature market in terms of its potential for economic and demographic growth than the US was in 1978, when Congress passed the Natural Gas Act and jump-started liberalization. US gas market liberalization required nearly 25 years, during which the country's overall energy usage and population each rose by approximately 25%.²³ New demand corridors emerged as population shifts occurred, particularly as growth occurred in the South and West and as the power generation sector shifted more toward natural gas. We do not expect such dramatic shifts to occur in Europe and believe liberalization could be achieved in a much shorter time frame, if governments can develop the requisite political will.

How might the US government actually finance strategic gas import infrastructure in Europe?

US strategic financial engagement in Europe is not a new concept—this analysis adds the new angle of using the financial support to facilitate natural gas supply diversification and ultimately help underpin European consumers’ energy security. In fact, 2017 marked the 70th anniversary of the Marshall plan, the \$13.2 billion (\$142 billion in today’s dollars) aid package offered by the US to post-war Europe that helped stabilize the economic situation and contributed to two decades of robust growth in Western Europe.

The Marshall Plan was controversial when it was first suggested, as it cost nearly 10% of the total federal budget at the time and offered no assurance of a positive return.²⁴ The plan was not born of an abstract sense of American generosity, nor of a mercantilistic desire to obtain specific direct benefits for the US economy. Rather, it was a strategic investment to help America’s partners in Western Europe revive themselves economically and strengthen their ability to resist Russian influence and communism. When Gen. George C. Marshall announced the plan in a June 1947 speech, he pointedly noted, “This is the business of the Europeans.”²⁵ The plan was structured to simultaneously advance American and European interests. Equally important, the preconditions for its success already existed in post-war Western Europe, including a broad experience with, and willingness to rely upon, markets as a way of allocating goods and services. As De Long and Eichengreen put it, “The Marshall Plan only tipped the balance.”²⁶

In a similar spirit, the gas geoeconomics investment strategy outlined in this paper recognizes that nearly all the necessary preconditions exist in the European gas sector. First, consumers broadly accept the idea of a market for gas. Second, an increasing proportion of supply arrangements are priced on the basis of gas-on-gas competition, rather than antiquated oil-linked formulae. Third, substantial underutilized LNG capacity that could help diversify supplies in Central Europe sits in the Iberian Peninsula. And fourth, the Third Energy Package, Connecting Europe Facility, and other measures undertaken over the past decade demonstrate that European policymakers

We envision US-funded investments in strategic gas import infrastructure as a way to help surmount the barriers currently posed by local political-economic structures, friction between national security and commercial priorities, and the EU’s lack of authority to effectively and directly impose gas market reforms within member states.

recognize the importance of diversified, flexible, and competitively priced gas supplies to Europe's long-term energy security and environmental well-being.

The key missing piece of the puzzle is who will pay for the infrastructure needed to facilitate and accelerate the process of bolstering supply security and reducing Russian energy leverage over European governments. And on the back of this strategic question arises the relevant operational question of how these investments can be funded and executed in a timely fashion.

There are multiple pathways through which gas infrastructure in Europe could conceivably be funded with capital from the US federal government. The following section briefly explores several of these options, which are ordered from lowest to highest in terms of their likelihood of triggering legal claims in European courts, before the European Commission (EC), or in the WTO.

Option 1: Use "forgivable debt."

This option would entail providing loans backed by the US Treasury Department to support time charters of floating LNG regasification ships and the construction of essential associated connective infrastructure to get gas into local pipeline networks. The project operator would pay no interest for the first 2 years of operation and then pay a preferential interest rate, for instance 50 basis points above the London Interbank Offered Rate (LIBOR) (L+50bps). **If the host country adopted and implemented reforms aimed at fostering gas market liberalization within a pre-negotiated timeframe, US-backed debt could be forgiven.**

Implementation could be measured on the basis of a number of metrics, including, but not limited to: (1) lifting price controls; (2) the physical unbundling of gas production, storage, and transmission infrastructure; (3) the emergence of verified, market-based trading of pipeline capacity; (4) verified, non-discriminatory third-party access by non-Russian controlled entities to gas pipelines in the country; and (5) trading turnover rates at virtual transfer points or gas hubs associated with the host country's gas pipeline network.

Option 2: Directly finance strategic gas import and transport projects and reimburse FSRU vessel charter and operating costs.

In this case, construction firms would competitively bid for pipeline and associated infrastructure projects. For pipelines and infrastructure supporting LNG terminals' connectivity to the pipeline system, direct finance could be done on a "two-for-one" monetary basis. For each US dollar equivalent of investment or in-kind services supporting the project, the US government would provide two dollars of grant money.

For FSRU charters, official financial support would be provided on the basis of a benchmark linked to a trailing 3-month average of charter rates for FSRU vessels of similar size operating under similar contract length. The charter reimbursement would also need to be linked to a local or regional inflation index.

Option 3: The US government provides “assured payback” to private import project developers.

The initial investments would be made with private capital, but if a mutually established rate of return target were not met within five years, US funds could be used to compensate the developers for the difference between actual returns and the minimum return negotiated at the project’s inception.

Option 4: Capitalize on the fungibility of money.

Other types of US financial engagement, especially on the military front, could be designed to also facilitate desired gas geoeconomics outcomes. For instance, if a given country was originally slated to receive a certain amount of European Reassurance Initiative (ERI) funds, that amount could be increased by an additional sum tied to the investment of that amount of money in a gas supply diversification project. For instance, Country X that was going to receive \$100 million in ERI funding could instead get \$200 million, provided that it invested the local currency equivalent of \$100 million into LNG import facilities, interconnector pipelines, or other supply diversification activities. Contributions could be via financial or in-kind contributions, such as permitting assistance, tax breaks to local companies facilitating the projects, etc.

Option 5: Provide preferential project finance loans.

This could be done by subsidizing interest rates on loans and/or by allowing the US Export-Import Bank to take a larger lending role than is typically the case. Such an approach could be especially useful for projects aimed at initiating the liberalization process in a particular country and showing capital markets that the jurisdiction is being “de-risked” from a gas sector investment perspective.

The five basic options outlined above should generally comply with the WTO’s prohibition of subsidies that are contingent upon export performance.²⁷ Such subsidies are designed to incentivize or promote exports that might not otherwise have happened. Each option detailed here is designed not to promote exports of a specific country, but rather to promote a more diverse array of gas imports into Europe. Any financial support for strategically important gas infrastructure would be “molecule indifferent”—whether the gas passing through the system came from Norway, Qatar, Russia, the US, or another supplier would not matter. In fact, the primary precondition

is that the system would be openly accessible to all freely tradable gas cargoes. A secondary precondition would be that projects must be connected to pipeline networks capable of enabling the transnational movement of gas.

Washington could fund gas infrastructure investments in accordance with EU law.

Gas infrastructure expansions backed by US funds would very likely be found compliant with both EU and local laws that govern such activities. The concept of a non-EU member state investing in gas importation and transport infrastructure with the intention of increasing gas supply diversity *regardless* of gas molecules' country of origin is a novel one. Nevertheless, the legislative intent behind current EU laws and regulations governing foreign investments more broadly and gas pipeline infrastructure matters more specifically both very strongly suggest that a pro-diversification, anti-monopoly strategy of funding additional LNG import terminals and various interconnector pipelines almost certainly complies with both the letter and the spirit of relevant EU laws. Furthermore, under the applicable EU laws and regulations, member states retain significant authority to decide on investment in natural gas infrastructure within their national borders.

At the level of rules broadly governing investment, consider that Article 101 of the Treaty of the Functioning of the European Union (TFEU) prohibits undertakings and concerted practices that would negatively affect trade or distort/restrict completion within the EU. Article 102 regulates issues related to dominant position abuse, including unfair pricing, limiting production, and prejudice to consumers. The 2004 EU Merger Regulation (EC No. 139/2004) expanded the TFEU's guidelines to detail how the EU should be empowered to exercise oversight on corporate transactions that would "significantly impede effective competition in the internal market or in a substantial part of it, in particular as a result of the creation or strengthening of a dominant position." Additional gas import infrastructure—even if funded by a third-party state—would fundamentally support competition and benefit consumers.

Specifically focusing on gas pipeline investments, the 2009 EU Natural Gas Directive requires unbundling, as well as certification of a transmission system operator or owner controlled by a person or persons from a third country or countries.²⁸ In fall 2017, the EC proposed that the Gas Directive be amended to "clarify that the core principles of EU energy legislation (third-party access, tariff regulation, ownership unbundling and transparency) will apply to all gas pipelines to and from third countries up to the border of the EU's jurisdiction."²⁹

The 2009 Gas Directive includes several articles that could potentially apply to US-backed investments. This includes Article 11, which gives the authority to approve investment within each member state to specially designated, independent regulatory authorities (RAs). Involvement of the European Commission is expected when a third country acquires control over a transmission system operator or transmission system owner. In this case, the member states' regulatory authorities are responsible for requesting an opinion from the commission on whether this entity complies with unbundling requirements and whether certification of the project would negatively affect the security of energy supply to the EU. Member states have to take into account the commission's position, but can deviate from the commission's suggested course of action so long as they articulate in writing their reasons for doing so.

The laws and regulations identified here share the common purpose of furthering the creation of a liberalized, common EU gas market with fair competition, high interconnectivity, secure supplies, and the maximization of consumer well-being. Accordingly, infrastructure built as part of a U.S.-backed gas geoeconomics strategy could easily be made fully compliant with such rules, since the motivations behind the proposed Gas Directive amendments and a hypothetical set of American-backed gas import corridors are the same: maximizing competition, minimizing certain parties' ability to use gas as a tool for coercion, and protecting consumers in Europe.

US-funded gas infrastructure diversification projects would not only comply with federal-level EU laws and regulations, but would also benefit from individual EU members' substantial authority to approve gas infrastructure projects within their national jurisdiction. EU federal rules apply indirectly because they must first be incorporated into the national law of a member state.

Even current measures such as the newly proposed "Regulation of the European Parliament and of the Council" that establish a framework for screening foreign direct investments in the European Union still do not supersede national decision-making authority on energy infrastructure projects. Rather, the proposed regulation would empower the EC to provide more guidance to member states with respect to foreign investment and to give nonbinding opinions, in addition to allowing governments to raise concerns about investment in other state(s). Yet notwithstanding those powers, the EC would still not have the authority to block projects in member countries.

Strategic pockets of catalytic financial support might be tied to a broader pro-liberalization policy in order to complement the EU's existing gas market policies. This, in turn, could help expedite the development of a truly competitive continent-wide natural gas marketplace in Europe.

Considering the above, any involvement of the US government (via funding or otherwise) in building and expanding natural gas infrastructure would have to be bilaterally (or multilaterally) negotiated and approved directly by EU member states according to their respective laws on foreign investment (and possibly other existing applicable national laws). Focused squarely on improving accessibility to the EU market and based on the principle of unimpeded and equal access to infrastructure, US projects would be consistent with EU rules and facilitate the EU's goals of diversity of supply, competition, and energy security. It is very likely that US-funded projects would be compliant with the unbundling principle from the outset and thus would not require exemptions to EU unbundling rules. Most importantly, the fundamental compatibility of US-backed gas import infrastructure projects with the core goals of EU/EC regulations on corporate transactions and gas infrastructure means that such projects should be able to survive legal challenges brought under EU law.

Potential Consequences for Russia

Greater competition from non-Russian gas supplies would force Gazprom to defend its market share in Europe, which is likely to reduce Gazprom's inframarginal rents (i.e., the margin between the company's cost of supply and the actual market price it realizes in various European destinations). Greater competition between gas sources could also reduce Russian state revenues through other channels. For instance, the recently inaugurated Yamal LNG project enjoys a 12-year holiday from Russia's mineral extraction tax, does not pay an export duty on its LNG shipments, and enjoys the use of subsidized port facilities.³⁰ These measures have helped keep the \$27 billion project on track despite sanctions and lower LNG prices globally, yet the subsidies come at a steep cost to the Russian treasury. Because the country is so dependent on oil and gas exports as a source of overall revenue, tax breaks are effectively foregone treasury income.³¹ This also suggests that sanctions would complement a gas geoeconomics approach aimed at bolstering supply diversity and promoting market liberalization in Europe, and each would multiply the other's effects.

If Russia turns more toward Asian gas markets, the subsidy burden could become much larger. The Power of Siberia project could cost as much as \$55 billion just to build, and tens of billions of dollars in additional capital expenditures to develop gas fields to feed the pipelines.³² Every billion US dollars per year that the Russian government spends to subsidize gas export projects is financially equivalent to reducing crude oil exports by nearly 180 thousand barrels per day (bpd)—roughly 3.5% of the volume exported in 2016—assuming oil export duties at January 2018 levels.³³ And Gazprom's quest to build Asia-facing gas export infrastructure still has a long way to go. As of year end 2017, the company had built approximately 1,300 km of the Power of Siberia pipeline system—slightly less than half of the system's total anticipated length.³⁴

Quantifying the Economic Benefits of Diversifying Away from Single-source Reliance on Russian Gas Supplies

Recent academic research strongly suggests that natural gas prices in a gas-importing European country tend to decrease when that country reduces its dependence on gas supplied from Russia.³⁵ The biggest pricing benefit comes from the initial diversification away from reliance on a single gas supplier. And from a geoeconomic perspective, funding of new LNG-focused import projects and supporting infrastructure that allows gas to penetrate deep into markets in Northeast and Central Europe can be tied to domestic and regional reforms aimed at enhancing gas market liberalization.

Lithuania tested this theory in 2014 when it acquired an FSRU—aptly named *Independence*—and secured a contract for LNG supplied by Statoil of Norway.³⁶ The terminal has also imported at least one LNG shipment from the US Gulf Coast, indicating an intent to access gas supplies on a truly global basis when commercial conditions make it favorable to do so. Lithuania’s decision to break Gazprom’s supply monopoly seems to reflect the national spirit that ushered Lithuanians into the streets more than 25 years ago, when the state became the first Soviet republic to seek independence from Moscow.

Prior to its lease of the *Independence*, Lithuania obtained all of its gas from Russia via Gazprom. The same year Lithuania imported its first shipment of Norwegian LNG, it negotiated a 23% price decrease with Gazprom.³⁷ In 2016, the discount grew to 46% off of 2014 prices.³⁸ Some of this price reduction can be explained by the falling price of crude oil, as most Russian contracts are indexed to the price of crude. Yet research by Hinchey (2018) finds that a substantial portion of Lithuania’s discounted price can also be explained by its diversification efforts. In fact, Hinchey’s model suggests that more than 130 million euros (USD 144 million) of Lithuania’s savings on gas purchases in 2016 are directly attributable to its decreased reliance on Gazprom as its natural gas supplier. To put that number in perspective, Lithuania’s current account deficit decreased by approximately USD 600 million between 2015 and 2016, going from -\$977 million to -\$379 million.³⁹ As such, nearly one quarter of the reduction in Lithuania’s current account deficit potentially came from more favorable gas purchase terms, which in turn were substantially facilitated by access to non-Russian gas imports. This suggests that investments aimed at creating greater competition between gas importers could yield similar benefits elsewhere in Eastern and Central Europe, where legacy infrastructure has generally given Gazprom a privileged market position.

Competitive Dynamics Between Major Gas Suppliers to Europe

Strategic investments in new and geographically targeted gas import and transmission infrastructure in key parts of Europe could introduce a significant increase of competition between suppliers. This competition would play out along at least

three important dimensions: (1) the willingness and capacity of various gas sellers to withstand variable cost pressures in the short term and full-cycle capital costs over the longer term; (2) the willingness of key importers to pay a “security premium” for gas in some cases; and (3) the evolution of demand in Asia, particularly in China and India, where demand growth could potentially absorb seaborne gas supplies that could otherwise drive down European prices.

Natural gas traded in regional and, increasingly, global markets is a fundamentally undifferentiated commodity product. Methane molecules are the same whether they come from the Permian Basin, Siberia, or Qatar’s North Field. The real differentiating factor is the availability of infrastructure linking producers and consumers. This is the pressure point through which geoeconomic tools can impact major gas flow patterns and prices. Price impacts in the form of foregone revenues would fall heavily on Russia. Yet an effective gas geoeconomics strategy would not impact the Russian treasury alone; it may also adversely affect key US allies such as Qatar and Norway, whose proportional reliance on natural gas export revenues is many times higher than that of the United States. Accordingly, if Washington chooses to employ gas geoeconomics strategies such as those we describe in this analysis, it will also need to intensively engage gas-exporting allies on the diplomatic front.

Key Dynamic 1: US LNG Exports and “Sunk Cost Logic”

US LNG supplies will play an increasingly important role in the European gas market due to their scale, gas-based pricing, and freely tradable nature. US exporters already operate at approximately 20 billion cubic meters (bcm) per year (around 15 million tonnes per annum [mtpa]) of liquefaction capacity, and another 73 bcm per year (around 54 mtpa) is poised to come online by 2020 as projects now under construction begin to enter service in late 2018, according to consulting firm Charles River Associates.⁴⁰ To put these volumes in a European perspective, they amount to nearly half the gas volume Gazprom sold to customers in Western Europe and Turkey during 2017, a record year for Russian gas exports.⁴¹

The present crop of US LNG plants—which are primarily located on the Gulf Coast—sell cargoes globally, but they are best situated to serve markets in the Atlantic Basin. Europe in particular offers a large and liquid gas marketplace ideal for trading spot cargoes, and is also located within two weeks’ sailing time of the US LNG export facilities.⁴² Geographical proximity matters, because flexible US supplies can respond quickly to price-driving events in various parts of Europe in half the time required to reach markets in East Asia.

Gazprom, Russia’s single largest gas supplier, offers a conflicting narrative on US LNG supplies’ ability to influence gas pricing in Europe. On one hand, there are pessimistic assessments such as that offered by Valery Nemov, deputy head of contract structuring and price formation at Gazprom Export, who in 2016 characterized US

LNG exports as sure to lose money during the next 20 years.⁴³ Yet Nemov’s statement contrasts sharply with more recent concrete actions, such as the Russian Energy Ministry’s decision to allow Gazprom to sell gas slated for LNG exports at unregulated prices rather than regulated domestic rates, as was previously the case.⁴⁴ The switch is arguably geared toward helping Gazprom’s planned Baltic LNG project near St. Petersburg compete with US shipments to Europe.⁴⁵ Ultimately, Gazprom’s broader patterns of statements and actions suggest its management is deeply unsettled by the prospect of larger and, potentially, more sustained flows of US LNG into Europe.

Figure 2. Illustration of How Sunk Cost Logic Can Influence Whether to Liquefy and Ship Gas (USD/MMBtu)

	Liquefaction fee			
	Treated as a variable cost		Treated as a sunk cost	
	Liquefy	Don't Liquefy	Liquefy	Don't Liquefy
Costs and realized pricing				
Feed gas purchase price (Henry Hub)	\$3.0	\$3.0	\$3.0	\$3.0
Liquefaction fee	\$2.5	\$2.5	\$2.5	\$2.5
Transportation fee	\$1.0	\$1.0	\$1.0	\$1.0
Regas fee	\$0.5	\$0.5	\$0.5	\$0.5
Destination gas price	\$5.5	\$5.5	\$5.5	\$5.5
Potential profitability				
Gross revenues	\$5.5	\$0.0	\$5.5	\$0.0
Variable costs	-\$7.0	\$0.0	-\$4.5	\$0.0
Fixed (i.e. "sunk") costs	liquefaction cost priced in	liquefaction cost priced in	liquefaction cost ignored in short-term	liquefaction cost ignored in short-term
Profit/loss (pre-tax)	-\$1.5	\$0.0	\$1.0	\$0.0
Economically rational to export LNG?				
	No	No	Yes	No

Sources: S&P Global Platts, Authors' analysis

A logical question at this point is why the world's largest single gas reserve holder and one of its lowest cost suppliers—endowed with an extensive and largely amortized pipeline system—would have such fear of a higher-cost gas producer. One key factor is how price and production economics risk are spread out between parties in the US market, and how this translates into practical decisions on whether or not to liquefy and export gas. These export decisions by US firms, in turn, have significant consequences for how much profit Gazprom can make on its exports to Western Europe, which underpin the company's balance sheet.

Natural gas traded in regional and, increasingly, global markets is a fundamentally undifferentiated commodity product. Methane molecules are the same whether they come from the Permian Basin, Siberia, or Qatar's North Field. The real differentiating factor is the availability of infrastructure linking producers and consumers.

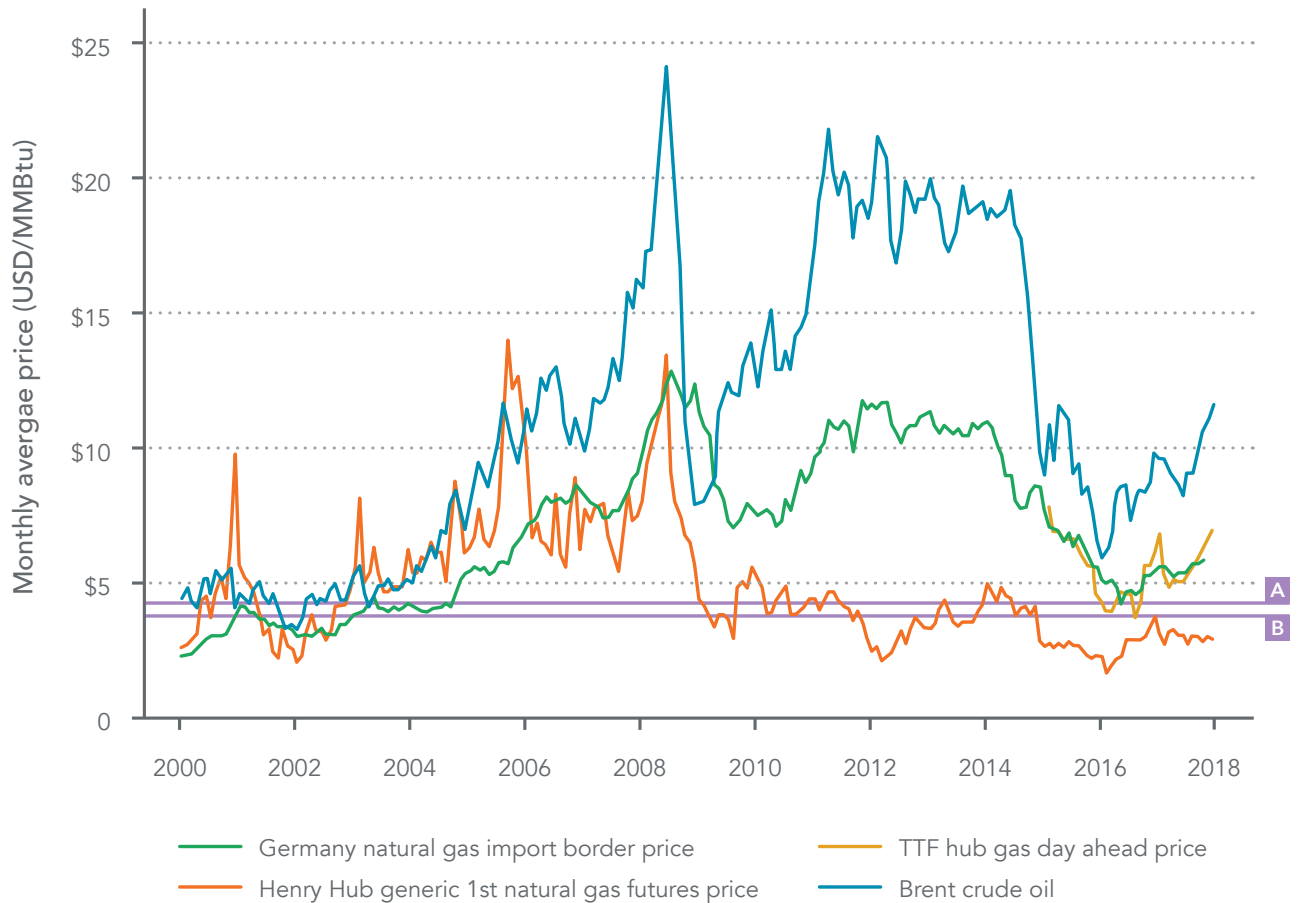
US producers' liquefaction decisions are presently made primarily on the basis of variable costs—in other words, the market price of feed gas, as well as transportation and regasification costs. This approach—which Platts dubs “sunk cost logic”—means that while LNG producers must bear the fixed costs of financing a multibillion dollar liquefaction plant, their transactions are driven by the margin they can make aside from those sunk costs.⁴⁶

Consider the following simplified example: An LNG plant can procure gas at the Henry Hub spot price of \$3/MMBtu. Liquefying the gas costs \$3/MMBtu, shipping it to a customer in Europe costs \$1/MMBtu, and regasifying it when the cargo arrives costs \$0.50/MMBtu. The trader thus faces

\$4.50/MMBtu in variable costs. If spot gas is trading for \$5.50/MMBtu at the landing point in Europe, this means the trader makes a margin of \$1/MMBtu on the transaction. Thinking about the trade in this way disregards the fixed price of liquefaction. The major reason for this is if the facility is already built, the owner is better off obtaining a “contribution margin” that at least partially covers fixed costs than to simply have the facility sit idle and be exposed to the full fixed cost repayment burden, without any offsetting income.

The long-term durability of gas trades based on “sunk cost logic” is fair to question, as Gazprom officials have done repeatedly. But for years to come, a substantial portion of US LNG exports are likely to flow to Europe, exerting downward pressure on local gas prices and, by extension, Russian gas revenues, as well as customers' willingness to enter into long-term oil-linked supply agreements.

Figure 3. Minimum Delivery Cost of Qatari LNG and Russian Pipeline Gas vs. Recent European Prices



Minimum likely delivery cost

A \$4.38/MMBtu

Russia (to German border)

Includes export tariff; investment and maintenance costs, transport, and production and severance tax

B \$3.50/MMBtu

Qatar (to Spain)

Includes costs for regas, shipping, and production and liquefaction

Note: All prices are monthly averages; oil prices converted at the rate of 5.8 MMBtu per barrel
Sources: Bloomberg, Gazprom, Kommersant, IHS Markit

US LNG producers have to date committed to long-term deals with take-or-pay obligations that cover about 80% of their terminals' outbound capacity.⁴⁷ Charles River Associates describes the resulting situation as one in which "liquefaction fees are effectively unavoidable costs until this capacity is utilized."⁴⁸ Consequently, liquefaction capacity owners are likely to decide they "might as well" run their plants to at least bring some revenue in the door to offset costs, as described above. Sunk cost logic also means that until the LNG trains are utilizing the roughly 80% of capacity referenced above, terminal operators have incentives to ship LNG cargoes so long as the spread between the destination price and variable costs exceeds zero and allows contribution toward the fixed costs of liquefaction.

There is still meaningful headroom until the 80% threshold is reached. For instance, Cheniere, which owns all currently operational US LNG export capacity and a significant portion of that under construction, ran its Sabine Pass facility at an implied annual capacity utilization rate of approximately 66% in the third quarter of 2017, the latest date for which data are currently available.⁴⁹ Taking 80% of the entire US LNG sector's roughly 90 bcm of operational and soon-to-be operational capacity suggests more than 70 bcm/year of gas would potentially be subject to trading decisions rooted in sunk cost logic. To put that number in context, it represents a volume of gas larger than what the Netherlands (Continental Europe's largest producer) produced at its near-term peak in 2010, and roughly 1.5 times the country's 2016 production. In short, the volumes of US LNG that are reaching the market will have real potential to offer stiff competition to gas from other suppliers in multiple regions of Europe.

Recent events in the oil market show that marginal supplies from the US shale boom can inflict multi-year price pain on the dominant global supplier, even if such supplies are entering the market under a production cost structure that is widely alleged to be "unsustainable" over the long term. It is highly conceivable that such a situation could arise in the gas markets as well, particularly since US exporters will need to be sending out nearly 75 bcm/year of gas before they have fulfilled the volumes they are contractually committed to under the take-or-pay agreements used to anchor financing for the plants.

Key Dynamic 2: How will the lowest cost global suppliers respond?

The competition for gas import market share in Europe over the next decade will most likely be between three core parties: (1) US-origin LNG as a marginal—but large—source of gas; (2) LNG from Qatar; and (3) pipeline gas from Norway and Russia competing for baseload market share volumes.⁵⁰

Russia has massive spare gas capacity, estimated by S&P Global Platts to be 170 bcm/year—more than twice the amount Germany consumed in 2016.⁵¹ But these supplies are likely to be constrained by the availability of export capacity. Most Russian gas travels to Europe by pipeline, and the combined capacity of its existing routes is

approximately 240 bcm/year (over 100 bcm/year via Brotherhood, 33 bcm/year via Yamal-Europe, 55 bcm/year via Nord Stream 1, and 16 bcm/year via Blue Stream into Turkey).⁵² With exports to the “far abroad” (i.e., non-former Soviet Union European countries and Turkey) equaling nearly 194 bcm in 2017, it appears that Gazprom has some “headroom” for additional exports in its existing pipes, but not by a massive amount—particularly given that the high-capacity Ukraine corridor now has elevated transit country risk, and Naftogaz of Ukraine is considering imposing steep transit fees on Russian gas.⁵³

Matters are further complicated by recently adopted US sanctions that give the US president authority to impose sanctions on any person who provides goods, services, technology, information, or other material support for energy export pipelines originating from the Russian Federation.⁵⁴ The sanctions are an implicit Sword of Damocles hanging over the head of service companies, engineering firms, and financiers who might otherwise be inclined to help Gazprom construct additional gas export routes, such as Nord Stream 2.

If Russian supplies indeed turn out to be constrained by non-geological factors, this leaves seaborne gas from the US and Qatar as the key potential sources of incremental supplies over the next five years. US LNG is explored above, and the ensuing discussion will focus on Qatari supplies and how they are likely to affect—and be affected by—a potential US-backed gas geoeconomics strategy in Europe. Qatar has lifted its moratorium on further development of the North Field and plans to expand LNG export capacity by an additional 23 million tpa (31 bcm/year).⁵⁵ Qatar has an advantage over other suppliers in terms of delivered gas cost, owing to its massively productive wells, liquids-rich production, relatively minor land use constraints on facility expansion, and first-mover advantage.

Qatar’s wells are extremely productive. Qatargas operates 208 wells in the North Field that deliver a total of 524 million cubic meters per day of gas, plus associated condensate and natural gas liquids.⁵⁶ With an average flow rate of 2.5 million cubic meters per day per well, these Qatari gas wells are roughly five times as productive per wellbore as those Novatek is using to feed the Yamal LNG project.⁵⁷ Furthermore, associated liquids enhance the economics of production from the North Field. To draw again on the Qatar vs. Novatek/Yamal LNG comparison, consider

Any financial support for strategically important gas infrastructure would be “molecule indifferent”—whether the gas passing through the system came from Norway, Qatar, Russia, the US, or another supplier would not matter. In fact, the primary precondition is that the system would be openly accessible to all freely tradable gas cargoes.

that Qatargas's Ras Laffan assets, which account for about half of Qatar's total LNG output, produce more than 5 times as much condensate and associated liquids per unit of dry gas as Novatek's Yamal LNG wells are projected to.⁵⁸ Liquids-rich gas confers substantial economic benefits because liquids sell at a significant premium relative to dry gas, especially in market environments characterized by intensive gas-on-gas competition. Extracting liquids from the gas stream and selling them costs less per unit of energy than the premium that they fetch on the market. For instance, separating liquids from raw natural gas and transporting them from the Permian Basin to the Gulf Coast costs approximately \$4.20/bbl or \$1.12/MMBtu, which likely offers a plausible approximation of what the process would cost in Qatar.⁵⁹

In a prolonged price/market share war with Russian gas in the European market, Qatar's low costs and offsetting revenues from liquids that are more valuable than gas per unit of energy would give it major staying power. We have constructed a simple model using data from Fattouh, Rogers, and Stewart⁶⁰ to estimate how low liquids and gas prices would need to drop before the net present value (NPV) would become negative for a new Qatari LNG train with a 25-year economic life. Even assuming a high 15% discount rate (i.e., minimum rate of return), such a facility could, while including debt service costs, still essentially break even with liquids at \$25/bbl and LNG selling for \$2.80/MMBtu in the European market *over the entire 25-year project life*—a price situation approximating market collapse (Figure 4).

Second, Qatar has a major frontrunner advantage over later entrants to the LNG space, as the bulk of Qatari capacity was built between 1994 and approximately 2010, when project costs tended to be much lower (Figure 5). This structural cost advantage will endure over time, particularly if a prolonged price war for European gas market share erupts as a result of strategic investments aimed at maximizing consumers' access to gas in previously underserved and under-diversified areas such as the Iberian Peninsula and the Baltic Sea and Adriatic Sea regions. To highlight the advantages conferred by legacy infrastructure capable of scaling up cost-effectively, consider that Qatari LNG facilities were built at a cost of \$600/tpa or less. In contrast, Russia's Yamal LNG project cost approximately \$1,636/tpa based on data from the project developer.

Qatar can also scale up production more rapidly and more cost-effectively than its competitors, including Russia. When Qatar announced in mid-2017 that it would expand LNG production by at least an additional 23 million tonnes per year, industry sources noted that approximately 10 million tonnes per year could be brought online quickly and at low cost by simply optimizing and upgrading *existing* facilities⁶¹ (for reference, 10 million tonnes of LNG is roughly equal to the combined annual gas demand of the Czech Republic and Slovakia in 2016).

Russia has massive volumes of gas (potentially equal to two-thirds of Qatar's total national production) that could theoretically be made available for export by

Figure 4. Economic Competitiveness of a Hypothetical 11 mtpa LNG Project in Qatar⁶²

Output	
LNG production, BCM/yr	15.2
LNG production, mtpa	11.2
Condensate and NGL production, bpd	128,000
LNG production, MMBtu/yr	542,640,000

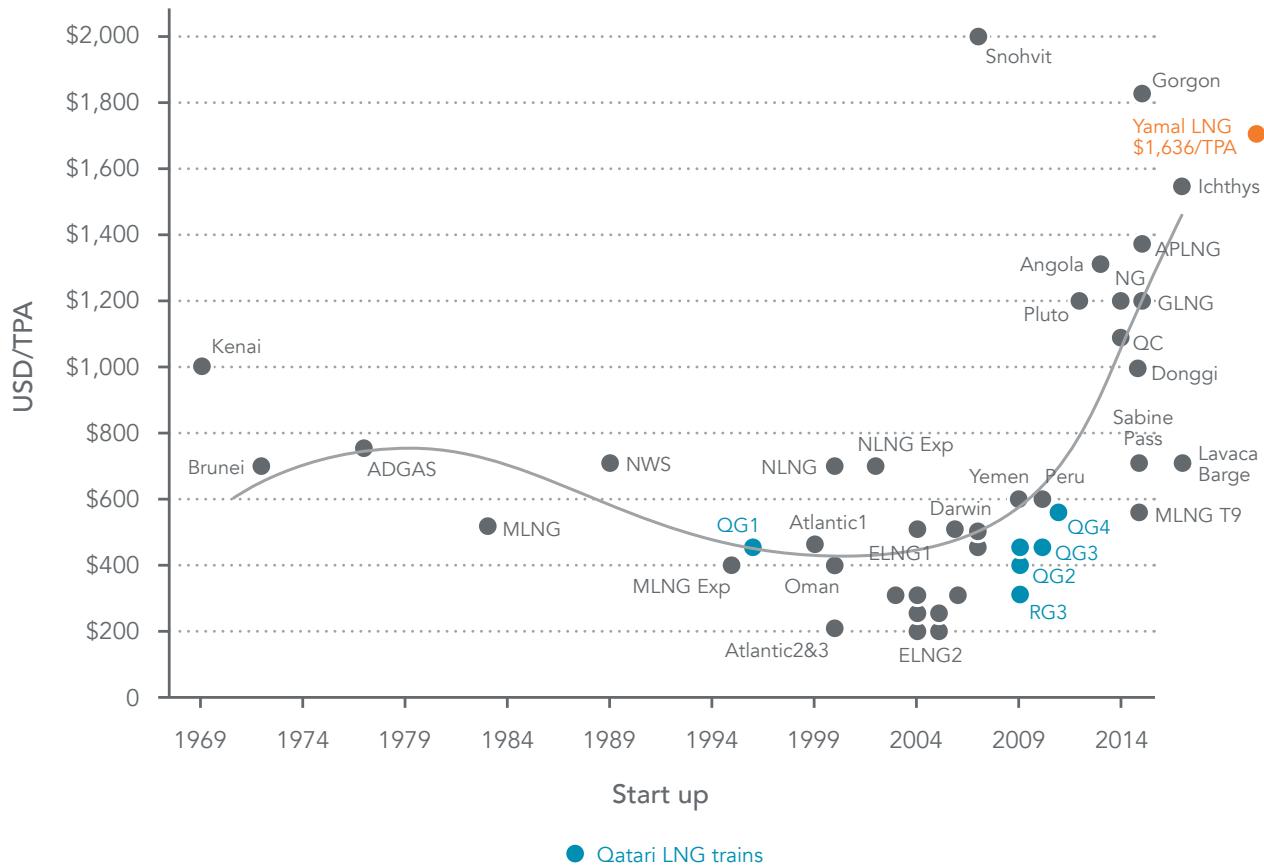
Costs and realized pricing (USD)	
Average liquids price per bb'	\$25.00
Liquids fractionation cost per bbl	\$4.00
LNG destination price per MMBtu	\$2.80
Gas production cost per MMBtu	\$0.22
LNG debt service cost per MMBtu (averaged)	\$0.57
LNG liquefaction cost per MMBtu	\$0.98
LNG transport cost per MMBtu	\$1.25
LNG regas cost per MMBtu	\$0.50
Net realized LNG price per MMBtu	-\$0.72

Revenue (USD)	
Annual net LNG revenue	-\$390,658,187
Annual net liquids revenue	\$981,120,000
Total annual net revenue	\$590,461,813

Cumulative financial outcome	
Economic life of project, years	25
Cumulative net revenue, USD	\$14,761,545,318
Discount rate	15.0%
Net present value (NPV), USD	\$389,797,256

Sources: Fattouh, Rogers, and Stewart; Authors' estimates

Figure 5. Qatari LNG Projects Enjoy Low Construction Costs and Lower Fixed Cost per Tonne of Liquefaction Capacity



Sources: Songhurst (2014),⁶³ Yamal LNG

reforming domestic prices and rationalizing residential and industrial usage. The most concrete estimate we have located to date of potential effects of domestic gas repricing on demand—and, implicitly, exportable gas supply—comes from a group of scholars at the Norwegian University of Life Sciences in Oslo.⁶⁴ Industrial users and electrical generation plants together account for approximately 60% of domestic gas use in Russia.

The Norwegian group’s models suggest that eliminating subsidies to these industrial consumers and electrical power plants could reduce domestic gas use by approximately 120 bcm/year relative to 2009 domestic gas demand levels.⁶⁵ Such a reduction would free up sufficient volumes of gas to easily supply Gazprom’s planned Altai and Power of Siberia projects (which together could theoretically supply nearly 70 bcm/year of gas to China, if operated at full capacity).

However, measures aimed at reducing domestic gas use would almost certainly rapidly run up against political concerns. The Russian government introduced plans in November 2006 to bring domestic prices to “netback” parity with what Russian exports fetched in Western European markets, minus transportation costs.⁶⁶ Gazprom data show that from 2007 to 2012, the company’s realized price for domestic gas sales more than doubled in terms of dollars (from \$53 per thousand cubic meters to \$112 per thousand cubic meters), but still significantly lagged behind netbacks from exports to Europe. However, pricing reform stalled after 2012 and basically stopped in 2014 as oil prices fell, the ruble devalued, and protection of domestic industries in the face of sanctions and macroeconomic shock became core policy priorities.

But current political and economic conditions in Russia make the probability of pricing reforms—and a rapid increase in exportable gas supplies—very low. Likewise, as analyzed above, US sanctions are likely to make it difficult and more costly for Russian firms to raise project finance capital for major export projects, especially pipelines.

Qatar, in contrast, is extremely motivated to increase gas production and exports in order to (1) maintain market share in the face of growing LNG exports from the US and other producers, (2) maintain national economic stability in the face of a Saudi-led blockade, and (3) maximize gas revenues before Iranian producers drain the shared North Field/South Pars gas deposit. These motivating factors, plus Qatar’s more streamlined and unified political leadership, make it very likely that Doha will actually deliver on its stated intent to boost gas output and LNG exports.

Key Dynamic 3: Gazprom’s Long-term Supply Contracts and the Move toward Gas-on-Gas Pricing in Europe

Gazprom’s supplies into Europe are anchored by long-term contracts, some of which have been in place for 40 years and counting. Perhaps the biggest impact the emergence of US shale gas has on Gazprom’s agreements comes from customers’ increasing insistence that their Russian gas supplies be priced not on the basis of linkage to oil products prices, but instead according to gas-on-gas competition at European hubs. Data from the International Gas Union show that 78% of gas consumed in Europe in 2005 was priced using oil-linked formulae, and only 15% was priced on a gas-on-gas basis. By 2016, 66% of gas was priced using the gas-on-gas approach, with only 30% of volumes priced based on oil products.

As the largest volume low-cost supplier into the European market, Gazprom can still collect the greatest rents even when its gas is priced against other gas sources. The company’s low marginal costs relative to most other suppliers—particularly the higher cost sources that set the market-clearing price—give it the ability to make money, despite the fact that contracts priced based on a gas hub may in fact yield a lower gas sales price than an oil-linked agreement would. By displacing higher-cost gas sources, increased gas infrastructure connectivity and access to LNG supplies—whether from

the US, Qatar, or another source—reduce the gap between the market clearing price and Gazprom’s marginal cost of supply.

As a result, Gazprom’s rents are reduced and, all else remaining equal, the company makes less money per unit of gas sold. This leaves it facing the decision to either (1) reduce gas supplies to bring prices back up (“defending the price”), or (2) send more gas into the market to drive out higher-cost suppliers and try to make back lost rents through higher sales volumes (“defending market share”). If other low-cost suppliers persist in maintaining high levels of supply—as happened with US shale in the global crude oil market over the past three and a half years—then a supply glut keeps prices low. And if a price war were to play out that way, Gazprom would effectively be trading against itself were it to increase supplies, as doing so would simply drive the market clearing price closer to the company’s marginal cost of supply.

Key Dynamic 4: Multiple Russian gas suppliers may end up competing with each other in Europe.

The intended result of the infrastructure buildup proposed in this analysis would be improved and freer access to the European natural gas market by *any* supplier of natural gas. This means the roster of potential suppliers who could avail themselves of the improved infrastructure connectivity is not just limited to Norway, Qatar, the US, and other LNG exporters; on the contrary, it also potentially includes Gazprom and other Russian suppliers. While Gazprom is currently the only Russian entity that is allowed to export natural gas via pipelines, Russia recently allowed other companies to export natural gas in the form of LNG following a strong push from domestic natural gas suppliers.⁶⁷

Until recently, this would have been of no consequence for the European market. The only Russian LNG exporter (prior to December 2017) was Sakhalin Energy, which is owned by Gazprom, Shell, Mitsui, and Mitsubishi and primarily supplies LNG to Japan, South Korea, and China.⁶⁸

However, on December 8, 2017, the new Yamal LNG terminal began to export natural gas.⁶⁹ The new operation is owned by Total S.A., the China National Petroleum Corporation (CNPC), China’s Silk Road Fund, and Novatek, Russia’s second-largest gas producer.⁷⁰ Yamal LNG is marketed as Russia’s opportunity to deliver natural gas to the Asian market. However, due to weather limitations, delivery to Asia will only be possible between July and December. During the remaining months—which include most of the winter, the season when natural gas is particularly sought after—harsh conditions make the route between Yamal LNG and Asia impenetrable, and Europe becomes the most natural export destination.⁷¹ This has important implications for Russia’s bargaining position with its European customers.

At first glance, Yamal LNG could potentially increase overall Russian gas supplies to European markets—and even more so if new, US-funded infrastructure allows for

easy regasification and transport. But the devil is in the details. Since Yamal LNG is run by Novatek, the LNG that reaches European shores effectively competes with pipeline supplies from Gazprom, which in turn likely amplifies the existing rivalry for the domestic gas market.⁷² This will tend to weaken Gazprom's bargaining power in Europe. In addition, it should negatively impact Russia's ability to use natural gas delivery to exert political influence, as the Russian government would first have to broker a compromise between Gazprom and Novatek, complicating its ability to use Gazprom as a lever to pressure entities in Europe.

Key Dynamic 5: How Gas Price Competition Interacts with Sanctions against Russia

The same short-run marginal cost logic that currently governs US LNG export decisions can also be applied to Russian pipeline gas exports. It currently costs Gazprom around \$0.43/MMBtu to extract gas, with a gas severance tax of \$0.47/MMBtu on top of that. Pipeline transport to the far abroad cost \$1.63/MMBtu in 2016, according to company data. These numbers suggest Russian gas could be delivered to Europe for as little as \$2.53/MMBtu in short-run marginal costs, if export taxes and longer-term upstream development and infrastructure maintenance costs are not included. This estimate may be too low, as other estimates—for instance, Henderson et al. from the Oxford Institute for Energy Studies—see Gazprom's short-run marginal cost of gas delivered to Germany as just under \$4/MMBtu.⁷³ Regardless, Gazprom can deliver gas to Europe at a lower short-run marginal cost than that of any competitor besides Qatar.

But to sustain a price war, Gazprom would have to persuade the Kremlin to significantly reduce the tax burden it places on the company. And that would crimp inflows of badly needed foreign exchange into the Russian treasury. Perhaps equally important from a long-term strategic perspective, operating at or near short-run marginal cost places Gazprom in a tough position, because without surplus income from sales in Europe—the company's only consistently profitable marketplace—it will be hard-pressed to finance current and future projects. Sales to Western Europe and Turkey account for about half of Gazprom's sales volume but comprise nearly 75% of "post-tax revenues," a proxy for actual profits.⁷⁴

The cost would primarily fall upfront in the program's first few years, while its ability to hedge against Russian coercion and reduce Russia's profits from gas sales into Europe would last for decades as countries liberalize their markets, private capital flows into politically de-risked corridors, and non-Russian natural gas suppliers strengthen their positions in Europe.

As such, depressing prices in the far abroad when the company has no other market outlets capable of offsetting lost profits will make it much more difficult to cover capital expenditure requirements from cash flow—especially for China-focused projects, such as the Power of Siberia and Altai pipelines. This matters because as mentioned above, US sanctions aimed at energy exports out of Russia are likely to seriously hamper Gazprom’s ability to access international capital markets to help finance these projects, whose combined upstream and pipeline-related costs could exceed \$75 billion, according to a research analyst from consulting firm Wood Mackenzie.⁷⁵ Gazprom may ultimately secure financing from Chinese gas buyers, but the terms will likely be unfavorable and not particularly profitable. CNPC has already rebuffed Russia’s request for a \$25 billion prepayment for gas deliverable through the Power of Siberia line, and Gazprom is now forced to self-finance the project.⁷⁶

Two fundamental financial paths lie ahead as Gazprom seeks to access the Chinese gas market it has long coveted, while trying to reconcile its China ambitions with the reality that Europe is—and will remain—its core gas market. The first path is self-finance, which Gazprom is already doing on the Power of Siberia project. Self-financing would be more practical in a high oil and gas price environment akin to that of 2008, when Gazprom’s largely oil-linked European export prices were more than twice their 2016 level. But the growing presence of US LNG, Qatar’s expansion plans, and relatively flat European gas demand presage a future in which Gazprom will likely need major direct and indirect state assistance in order to self-finance essential capital investment for existing operating assets, as well as its expensive Asian export plans.

Self-financing Asian export pipelines is also likely to further erode Gazprom’s already tenuous long-term capital position. A recent analysis by the International Institute for Strategic Studies calculates that with Russia’s existing 30% tax on natural gas exports and a discount rate of 3.5% (as opposed to the 10% generally used for commercial projects), the Power of Siberia project would need oil prices to be around \$60/bbl to make its net present value (NPV) positive.⁷⁷

If the project was expected to meet more standard “commercial” expectations and maintain the Russian government’s desired 30% export tax, Brent oil prices would need to remain above \$100/bbl over the project’s lifetime in order for its NPV to be positive.⁷⁸ Lower oil prices would mean the project is destroying capital and would either (A) need to get higher prices for its gas, which China would almost certainly reject, or (B) the Russian government would need to step in, reduce taxes, and possibly provide supplementary financial assistance as well. Here it bears noting that the gas price of \$350/thousand cubic meters (\$9.80/MMBtu) implied in the 2014 agreement between Gazprom and CNPC may not stand the test of time amid continued low global gas prices.⁷⁹ A price of nearly \$10/MMBtu, plus an additional \$2.50/MMBtu to move the gas from the China-Russia border into the prime gas market zones on China’s east coast, makes the gas expensive, especially when for

the past three years, gas from Turkmenistan and other Central Asian suppliers likely had a city gate price in Shanghai of approximately \$10/MMBtu—a 25% discount relative to the expected price of the Power of Siberia gas at the Shanghai city gate. If CNPC consistently loses money on gas supplied through the Power of Siberia line, it may seek to renegotiate the pricing and/or volume terms of the contract between it and Gazprom. There is ample precedent for this from some of Gazprom's longest standing European customers, many of whom have succeeded in using arbitration and bilateral negotiations to force changes to long-term supply agreements, such as the adoption of hub-based pricing that reflects competition among gas suppliers.⁸⁰

The Kremlin can pull various financial levers to help Gazprom keep molecules flowing—and maybe even expand the volume and destinations of those flows—but doing so will come at the expense of Russia's broader economic base. Economic shortfalls can translate into restrictions on Russia's ability to exercise power at home and abroad. An enhanced ability on the part of European countries to procure responsive and low-cost LNG supplies through gas pipelines and floating LNG import capacity (as this paper advocates) would further intensify Russian leaders' financial dilemmas.

The second possible path for Gazprom is to try and raise capital externally. But with the threat of sanctions hanging overhead, any counterparty will drive a hard bargain. The entities most likely to consider financing future Gazprom projects—either the Altai pipeline or smaller ventures—would likely be from China. The “loans for gas” type of financial agreement likely to emerge from the negotiations would probably dramatically reduce the project's profitability to Gazprom. There are analogues from the oil industry that suggest such prepayment deals can be quite unfavorable to the commodity-producing recipients of Chinese funds who pledge commodity volumes as part of the loan repayment process. For instance, Ecuadorian sources claim that during fall 2017, PetroChina International was purchasing loan repayment oil from Petroecuador with discounts of up to 15% relative to spot market prices during that time.⁸¹

Conclusion

The policies discussed in this paper boil down to one core objective: increasing supply diversity and competition. The US should ultimately be indifferent to the source of Europe's gas molecules, so long as they come through enough channels to reduce any single supplier's ability to coerce consumers. Whether the gas comes from Sabine Pass, Qatar, Norway, or Russia-based LNG producers, it should be welcome from the US perspective, as long as it diversifies European gas supplies away from dependency on Russian-controlled pipeline supplies.

US-backed investments and other financial support for greater pipeline connectivity and LNG import capacity are a key first step in this process. The outcome is not

fully certain, and such geoeconomic investments should be viewed as “risk capital” that could be lost in part or entirely. It is important to be honest about this when discussing the idea with officials in Washington. But the upfront financial risk is worth taking in light of the potentially dire consequences that could result from Russian decisions to employ gas coercion more broadly in Europe. Furthermore, if sanctions are kept as is—or possibly tightened—the costs of even an ambitious plan of US-funded gas infrastructure investments in Europe are far lower on a proportionate basis for Washington than the costs that such an approach would likely inflict on Russia through the loss of inframarginal rents on gas and forced self-funding of export diversification projects.

The gas geoeconomics plan taps into strong sentiments by certain US political factions that Washington needs to get more involved with European energy security issues. It would also help offset Russia’s ability to use the planned Nord Stream 2 pipeline as a way to isolate and coerce countries in Central and Eastern Europe. Gas geoeconomics could potentially save American taxpayers money in the long term by harnessing the market to help constrain Russian revanchism and underpin European energy security.

Think about it this way: even a \$5 billion annual investment in Europe’s gas supply security would only equal 0.13% of the total U.S. federal budget for fiscal year 2018 and about 1% of anticipated defense spending in that year. And the cost would primarily fall upfront in the program’s first few years, while its ability to hedge against Russian coercion and reduce Russia’s profits from gas sales into Europe would last for decades as countries liberalize their markets, private capital flows into politically de-risked corridors, and non-Russian natural gas suppliers strengthen their positions in Europe. By stimulating such development, US jump-start money would be progressively “sunsetting” out as private funds take over and a more broadly liberalized gas marketplace bolsters European resilience in the face of potential gas coercion by Russia.

As Gen. Michael Hayden, former NSA director, recently told *The Atlantic*: “Sometimes you have successful covert operations that you wish hadn’t succeeded.”⁸² The ultimate collateral economic consequences for Russian interests of a more robust US-led gas geoeconomics strategy may make Russia’s leadership wish it had not launched the invasion of Crimea, stoked the war in eastern Ukraine, and knowingly supported influence operations against the 2016 US presidential election and democratic processes across Europe.

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