

*Working Paper*

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

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## Intro

*“...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.”*

—Amb. Mary Warlick, Acting U.S. Special Envoy for International Energy Affairs,  
June 2017<sup>1</sup>

Many European leaders recognize the strategic imperative to hedge against the risk that Moscow could feasibly use dependence on imported 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 and seize the opportunity to liberalize their gas markets and with it, more fully assure gas supply security.

As Thierry Bros of the Oxford Institute for Energy Studies insightfully puts it: “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.”<sup>2</sup> 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 conjunctively exercises economic and political influence in some Central and Eastern European countries that have historically depended heavily on Russian gas.<sup>3</sup>

Second, Europe has pockets of liberalized gas trade—for instance near the NBP and TTF hubs in Northwest Europe—but nothing Continent-wide akin to the marketplace which exists in the U.S., for example. In particular, natural gas markets in Central and Eastern Europe 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. In effect, governments in the CEE have been focused much more on diversification of its energy supplies, putting liberalization on the back burner. Paradoxically, at the level of diversification this region has

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<sup>1</sup> “Energy issues affecting Europe, including energy security and cooperation,” U.S. Department of State, teleconference hosted by The Brussels Hub, Belgium,  
<https://www.state.gov/r/pa/ime/useuropeanmediahub/271961.htm>

<sup>2</sup> “EU even more dependent on Russian gas,” The National (UAE), 14 January 2018,  
<https://www.thenational.ae/business/energy/eu-even-more-dependent-on-russian-gas-1.695131>

<sup>3</sup> For an in-depth analysis of past Russian use of energy exports as a coercive instrument, please see: Gabriel Collins. 2017. Russia’s Use of the “Energy Weapon” in Europe. Issue brief no. 07.18.17. Rice University’s Baker Institute for Public Policy, Houston, Texas.  
[https://www.bakerinstitute.org/media/files/files/ac785a2b/BI-Brief-071817-CES\\_Russia1.pdf](https://www.bakerinstitute.org/media/files/files/ac785a2b/BI-Brief-071817-CES_Russia1.pdf)

achieved to date, 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) pre-emptive 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<sup>4</sup>—using “economic instruments to produce beneficial geopolitical results”—as a potential source of new and scalable policy options for the U.S., 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-level—security concerns?
2. How can policymakers potentially incentivize national level decision makers and monopoly gas distribution service providers in Europe to facilitate more rapid gas market liberalization?

We envision U.S.-funded investments in strategic gas import infrastructure as a way to help bridge 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 the member states. In a fully liberalized gas market environment, private capital would flow towards 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 shuts out private funds. The U.S. 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 U.S. 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 help crack through walls and be multiplied by follow on private investments.**<sup>5</sup>

What’s more, our proposed targeted deployment of financial assets would be consistent with the current intensification of U.S. energy diplomacy in Europe. Financial support would be contingent upon recipient countries taking concrete actions to foster gas market liberalization, including

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<sup>4</sup> Amb. Robert Blackwill and Jennifer Harris, “War by Other Means: Geoeconomics and Statecraft,” Council on Foreign Relations, 2016, P.20

<sup>5</sup> The authors’ private conversations have yielded anecdotal evidence that at least some key industry participants would be willing to invest in infrastructure to enhance gas supply connectivity within the CEE region—if local political realities would allow such capital deployments.

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 new ones and elevate the conversation on the critical topic of European gas and energy security.

## **The Unconventional Gas Revolution Offers the Chance to Re-Think How the U.S. Applies Power in Europe**

Over the past 25 years, the U.S. has frequently deployed its financial power reactively in the form of sanctions, at times with the intention of affecting 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. 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 U.S. diplomacy.

The State Department’s Bureau of Energy Resources (“BER”) has, for several years and running, engaged in significant energy diplomacy in Europe where the Bureau “works with our allies...to support their efforts on energy diversification of fuel types, source countries, and delivery routes” and conducts these efforts as part of a larger global focus on “market-based energy solutions.”<sup>6</sup> The U.S. government has also displayed a limited willingness to fund efforts that signal support for construction of new gas supply routes in Europe—such as a \$956,000 grant the U.S. Trade and Development Agency awarded in 2015 for a feasibility study of Transgaz S.A.’s, proposed pipeline expansion project in Romania.<sup>7</sup> 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. Energy security solutions that emphasize market liberalization are 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.”<sup>8</sup> 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 lies the advantages that could be realized through a gas

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<sup>6</sup> Bureau of Energy Resources, U.S. Department of State, <https://www.state.gov/e/enr/>

<sup>7</sup> “USTDA Strengthens Support For Energy Security In Romania,” U.S. Embassy in Romania, 24 September 2015, <https://ro.usembassy.gov/ustda-strengthens-support-energy-security-romania/>. The feasibility study aimed to improve and confirm the technical design and economic and financial specifications of a transnational gas interconnector project, namely, for building the Romanian section of the Bulgaria-Romania-Hungary-Austria Connector (BHRA) and the Black Sea-Shore-Podisor Connector.

<sup>8</sup> <https://www.bakerinstitute.org/media/files/files/c125a407/testimony-medlock-senr-020818.pdf>

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 potential Russian use of gas as an “energy weapon.”<sup>9</sup> The strategy is cost-effective and complies with EU energy law. Also, if successful, it could potentially reduce Russian gas sector revenues, thus reducing the pool of resources the Kremlin could otherwise use to fund destabilizing activities in Europe and further afield.<sup>10</sup>

Opening more channels for alternative gas supplies into 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.”<sup>11</sup> Neither sanctions nor the NATO military presence 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 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 total daily gas production of Russia in 2016—the world’s second largest gas producer.<sup>12</sup> 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 the Continent’s East and Center—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 and dependence on Russian gas within the EU, we see the Iberian Peninsula, Baltic Sea, and Adriatic area as the key zones for new inbound pipeline and LNG regasification infrastructure (**Exhibit 1**). 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.”<sup>13</sup>

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<sup>9</sup> For an in-depth analysis of past Russian use of energy exports as a coercive instrument, please see: Gabriel Collins. 2017. Russia’s Use of the “Energy Weapon” in Europe. Issue brief no. 07.18.17. Rice University’s Baker Institute for Public Policy, Houston, Texas.

[https://www.bakerinstitute.org/media/files/ac785a2b/BI-Brief-071817-CES\\_Russia1.pdf](https://www.bakerinstitute.org/media/files/ac785a2b/BI-Brief-071817-CES_Russia1.pdf)

<sup>10</sup> For a detailed discussion of such subversion efforts, please see “Putin’s Asymmetrical Assault on Democracy in Russia and Europe: Implications for U.S. National Security,” United States Senate Minority Staff Report, 10 January 2018, [https://www.foreign.senate.gov/imo/media/doc/SPrt\\_115-21.pdf](https://www.foreign.senate.gov/imo/media/doc/SPrt_115-21.pdf)

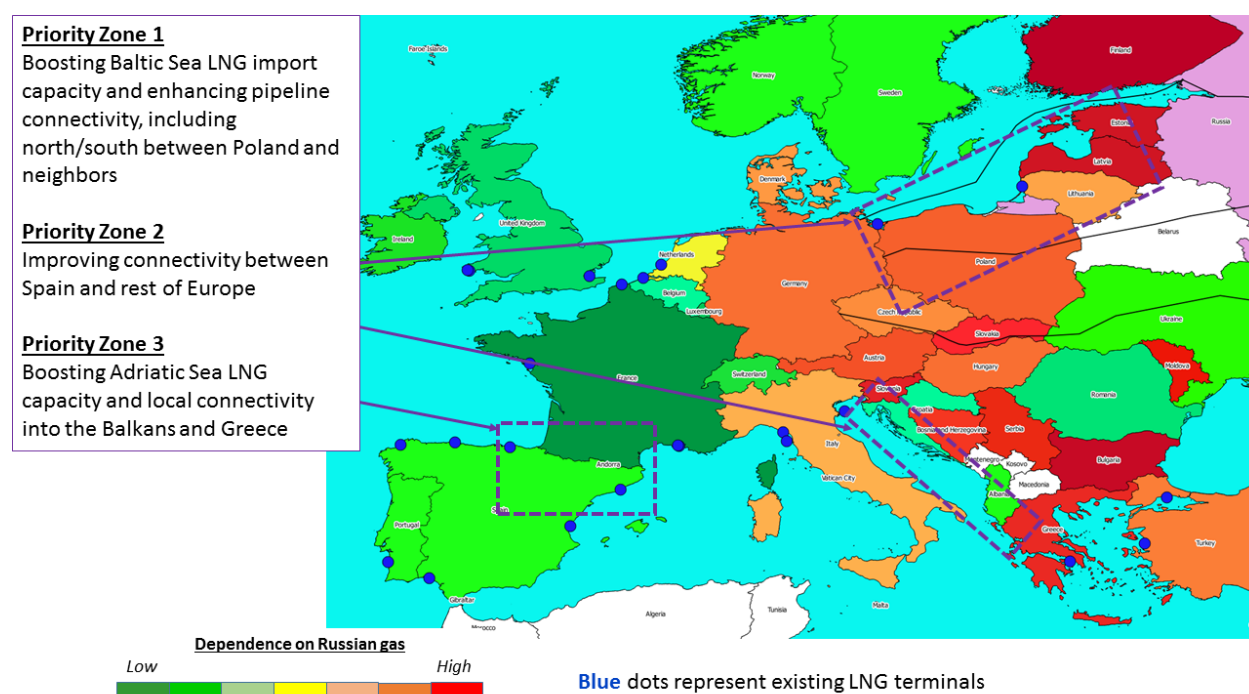
<sup>11</sup> Ken Medlock and Kelly Miller, “A “Credible Threat” Approach to Long Run Deterrence of Russian-European Hegemony,” <https://www.forbes.com/sites/thebakersinstitute/2014/03/10/a-credible-threat-approach-to-long-run-deterrence-of-russian-european-hegemony/#380f6efd5072>

<sup>12</sup> Tellurian January 2018 Corporate Presentation, <https://ir.tellurianinc.com/presentations>; Data from BP Statistical Review of World Energy, 2017

<sup>13</sup> Patrick Heather and Beatrice Petrovich, “European traded gas hubs: an updated analysis on liquidity, maturity and barriers to market integration,” The Oxford Institute for Energy Studies, May 2017,

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

### Exhibit 1: Priority Zones for Geo-Economic Gas Investments



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

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 **Exhibit 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 U.S.-Backed Investments Mesh With These?

The European Union already invests in energy supply "projects of common interest" through the "Connecting Europe Facility" (CEF).<sup>14</sup> The CEF aims to help fund projects that would match future

<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/05/European-traded-gas-hubs-an-updated-analysis-on-liquidity-maturity-and-barriers-to-market-integration-OIES-Energy-Insight.pdf> (P.28)

<sup>14</sup> "Connecting Europe Facility," The European Commission, <https://ec.europa.eu/inea/en/connecting-europe-facility> (accessed 9 April 2018)



demand for energy, ensure supply security, and/or support deployment of renewables.<sup>15</sup> 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. U.S. financial support—whether through direct fund transfers, loans, subsidized debt, or other means of underwriting—could turbocharge the CEF.

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, U.S.-backed investments would focus primarily on increasing the net amount of gas that can be imported into 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 the U.S. government help finance are in fact 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 re-gas 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.<sup>16</sup> Spain currently has only two pipeline connections that allow gas to flow across the French border into the broader European marketplace: Larrau and Biriattou, 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).<sup>17</sup>

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.

### **U.S. Involvement Could Potentially Help Surmount Political Resistance to Market Liberalization in Central and Eastern Europe**

Key U.S. partners –particularly in Central and Eastern Europe—are likely to welcome a more assertive, financially-backed U.S. 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.*"<sup>18</sup> The Minister even posed the possibility that Poland could re-export natural gas imported from the U.S. "*if the U.S. offers*

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<sup>15</sup> Ibid.

<sup>16</sup> BP Statistical Review of World Energy, 2017.

<sup>17</sup> <https://www.ft.com/content/056e89b0-19b1-11e5-a130-2e7db721f996>

<sup>18</sup> <https://www.tvp.info/34096576/waszczykowski-po-2022-r-chcemy-uniezaleznic-sie-od-dostaw-rosyjskiego-gazu>



*competitive prices.*"<sup>19</sup> Likewise, when Lithuania inaugurated the Klaipeda LNG Terminal in October 2014, President Dalia Grybauskaitė noted that *"From now on, nobody will dictate us the price for gas – or buy our political will."*<sup>20</sup>

#### **A. Supply Diversification Should Occur in Tandem With Gas Market Liberalization**

While top political leaders and officials handling gas security issues in the Central and Eastern European countries generally broadly support diversification of gas imports, the willingness of domestic firms to facilitate gas market liberalization that undermines their long-held monopoly 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 long-standing privileged position to competition.

The process of gas market liberalization in Poland and other countries faces potential political complications, especially as the relationships between some CEE countries and the EU authorities in Brussels have recently worsened.<sup>21</sup> These politics matter because Brussels lacks the comprehensive regulatory powers of, for example, the U.S. federal government. Furthermore, corporate actors in Europe who have 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 were to be the case, the investments would make less sense, as the capital deployments' core purpose is to help build the physical backbones needed to help diversify gas sourcing and move molecules around 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 U.S.-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 U.S. 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 palatable persuasion and funds.

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<sup>19</sup> <https://www.tvp.info/34096576/waszczykowski-po-2022-r-chcemy-uniezaleznic-sie-od-dostaw-rosyjskiego-gazu>

<sup>20</sup> Simon Hoellerbauer, "Baltic Energy Sources: Diversifying Away from Russia," 14 June 2017, <https://www.fpri.org/article/2017/06/baltic-energy-sources-diversifying-away-russia/>

<sup>21</sup> See, for instance: Simon Nixon, "EU Skeptics Come to Life Over Poland's Tangles With Brussels," The Wall Street Journal, 17 January 2018, <https://www.wsj.com/articles/eu-skeptics-come-to-life-over-polands-tangles-with-brussels-1516220742>

### **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 U.S. 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, for instance, in contemporary China where continuing and relatively rapid development makes it fraught 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 U.S. was in 1978 when Congress passed the Natural Gas Act and jump started liberalization. U.S. gas market liberalization required nearly 25 years, during which the country's overall energy usage and population each rose by approximately 25%.<sup>22</sup> New demand corridors emerged as population shifts began, particularly with growth in the South and West and as the power generation sector shifted more towards natural gas. We do not expect such a dramatic shift to occur in Europe and therefore believe liberalization could be achieved in a much shorter time frame if governments can develop the requisite political will.

### **How Might the U.S. Government Actually Finance Strategic Gas Import Infrastructure in Europe?**

U.S. strategic financial engagement in Europe is not a new concept—this analysis simply advocates doing so with the additional wrinkle that the financial support facilitates natural gas supply diversification and ultimately helps underpin European consumers' energy security. In fact, 2017 marked the 70<sup>th</sup> anniversary of the Marshall plan, a \$13.2 billion (\$142 billion in today's dollars) aid package offered by the U.S. 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 first suggested, with a cost equal to nearly 10% of the total Federal budget at the time and no promise of a positive return.<sup>23</sup> The plan was not borne of an abstract sense of American generosity, nor a mercantilistic desire to obtain specific direct benefits for the U.S. economy. Rather, it was a strategic investment to help America's partners in Western Europe revive themselves economically and strengthen their ability to resist malign Russian influence and communism.

When General Marshall announced the plan in a June 1947 speech, he pointedly noted that: "*This is the business of the Europeans.*"<sup>24</sup> The plan was structured to simultaneously advance American

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<sup>22</sup> Data from BP Statistical Review of World Energy, 2017 and U.S. Census Bureau.

<sup>23</sup> "Remarks by Treasury Secretary Robert E. Rubin on the 50th Anniversary of Marshall Plan ,George Washington University," U.S. Department of the Treasury, 2 June 1997, <https://www.treasury.gov/press-center/press-releases/Pages/rr1718.aspx>

<sup>24</sup> "Postwar Marshall Plan that rebuilt Europe marks 70th anniversary," U.S. Embassy and Consulates in France, 6 June 2017, <https://fr.usembassy.gov/postwar-marshall-plan-rebuilt-europe-marks-70th-anniversary/>

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 De Long and Eichengreen put it: “*The Marshall Plan only tipped the balance.*”<sup>25</sup>

In a similar spirit, the gas geoeconomics investment strategy outlined in this paper recognizes that nearly all of the necessary preconditions exist in the European gas sector. Consumers broadly accept the idea of a market for gas. An increasing proportion of supply arrangements are priced on the basis of gas-on-gas competition, rather than antiquated oil-linked formulae. Substantial underutilized LNG capacity that could help diversify supplies in Central Europe sits in the Iberian Peninsula. And of critical importance, the Third Energy Package, Connecting Europe Facility, and other measures undertaken over the past decade demonstrate European policymakers’ recognition of the importance of diversified, flexible, and competitively-priced gas supplies to Europe’s long-term energy security and environmental wellbeing.

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 can these investments 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 U.S. federal government. The following section briefly explores several of these options, which are ordered from lowest to highest based on their likelihood of triggering legal claims in European courts, before the European Commission, or in the WTO.

**Option 1: Use “forgivable debt.”** Provide U.S. Treasury Department-backed loans to support time charters of FSRUs and 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 project operation and then pay a preferential interest rate, for instance LIBOR + 50 basis points. **If within a pre-negotiated timeframe the host country adopted and implemented reforms aimed at fostering gas market liberalization, U.S.-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) 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

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<sup>25</sup> J. Bradford De Long, Barry Eichengreen, “The Marshall Plan: History’s Most Successful Structural Adjustment Program,” NBER Working Paper No. 3899, November 1991, <http://www.nber.org/papers/w3899> (P.57)

**Option 2: Directly finance strategic gas import and transport projects; 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 U.S. dollar equivalent of investment or "in-kind" services supporting the project, the U.S. government would provide two dollars of grant.

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 re-imburement would also need to be linked to a local or regional inflation index.

**Option 3: U.S. 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 was not met within 5 years, U.S. 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 U.S. 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 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 (at LIBOR or LIBOR + 50 basis points and/or, by allowing the U.S. EXIM 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.<sup>26</sup> 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**

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<sup>26</sup> "Agreement on Subsidies and Countervailing Measures ("SCM Agreement")," World Trade Organization, [https://www.wto.org/english/tratop\\_e/scm\\_e/subs\\_e.htm](https://www.wto.org/english/tratop_e/scm_e/subs_e.htm)

**system came from Norway, Qatar, Russia, the U.S., 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 transnational movement of gas.

### **Washington Could Fund Gas Infrastructure Investments in Accordance with EU law**

Gas infrastructure expansions backed by U.S. funds would very likely comply with both EU and local laws governing 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-diversity, anti-monopoly strategy of funding additional LNG import terminals and various interconnector pipelines almost certainly complies with both the letter and spirit of relevant EU laws. Furthermore, under the applicable EU laws and regulations, Member States retain significant authority to decide about investment in natural gas infrastructure within their national borders.

At the level of rules broadly governing investment, consider that the Treaty of the Functioning of the European Union (TFEU) Article 101 prohibits undertakings and concerted practices that would negatively affect trade or distort/restrict competition within the EU. Article 102 regulates issues related to abuse of dominant position, 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.<sup>27</sup> The European Commission proposed in the fall of 2017 that the Gas Directive be amended to "clarify that the core principles of EU energy

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<sup>27</sup> "Certification of transmission system operators" per art. 10 2009/73/EC (DIRECTIVE 2009/73/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC). Certification is regulated in detail by Art. 3,, REGULATION (EC) No 715/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005). Certificates are issued by applicable Member States' authorities and verify that the operator in question conforms with the unbundling requirements per Art. 9 2009/73/EC Directive (Unbundling of transmission systems and transmission system operators). If the operator is from outside of the EU Art. 11 Directive 2009/73/EC applies (Article 11. Certification in relation to third countries).

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."<sup>28</sup>

The 2009 Gas Directive includes several articles that could potentially to apply to U.S.-backed investments. This includes Article 11, which places authority to approve investment within each Member state in the hands of specially designated, independent Regulatory Authority (RA). Involvement of the European Commission (EC) is expected when a third country acquires control over transmission system operator or transmission system owner. In this case, the member states' regulatory authorities are responsible for requesting opinion from the EC on whether this entity complies with unbundling requirements and whether certification of the project would not negatively affect security of energy supply to the Community. Member States have to take into account the EC's position but can diverge. If so, an MS have to publish both, its decision and EC's opinion and include reasoning that justifies deviation from EC's suggested course of action.

The laws and regulations identified share a common purpose of furthering the creation of a liberalized common EU gas market with fair competition, high interconnectivity, secure supplies, and maximization of consumer wellbeing. Accordingly, infrastructure built as part of an American flavored 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 protection of consumers in Europe.

U.S.-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 establishing a framework for screening of foreign direct investments into the European Union (SWD(2017)297) still do not supersede national decisionmaking authority on energy infrastructure projects. Rather, the proposed regulation empowers the EC to provide more guidance to Member States with respect to foreign investment and would give the EC power to give nonbinding opinions and allow governments to raise concerns about investment in other state(s) underlines that EC has no power to block such investments. Yet notwithstanding those powers, the EC would still not have the authority to block projects in member countries.

Considering the above, any involvement of the U.S. 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, U.S. projects would be consistent with EU rules and facilitate its goals of diversity of supply, competition and energy security. It is very likely that U.S.-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 U.S.-

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<sup>28</sup> [http://europa.eu/rapid/press-release\\_IP-17-4401\\_en.htm](http://europa.eu/rapid/press-release_IP-17-4401_en.htm)



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 infra-marginal rents (i.e the margin between the company's cost of supply and the actual market price 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 the Mineral Extraction Tax, does not pay an export duty on its LNG shipments, and enjoys the use of subsidized port facilities.<sup>29</sup> 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 & gas exports as a source of overall revenue tax breaks are effectively foregone treasury income.<sup>30</sup> This also suggests that sanctions and a gas geoeconomics approach aimed at bolstering supply diversity and promoting market liberalization in Europe would be complementary and multiply each other's effect.

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.<sup>31</sup> Each 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 bpd (roughly 3.5% of the volume exported in 2016), assuming oil export duties at January 2018 levels.<sup>32</sup> 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.<sup>33</sup>

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<sup>29</sup> <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/03/Russian-LNG---Progress-and-delay-in-2017-OIES-Energy-Insight.pdfv>

<sup>30</sup> Between 2010 and 2014, oil and gas revenues accounted for roughly half of Russia's federal budget revenues and even with low commodity prices in 2016, the oil and gas sector still contributed approximately 36% of total budget revenue "Federal Budget of the Russian Federation," Ministry of Finance of the Russian Federation, [http://old.minfin.ru/en/statistics/fedbud/?id\\_38=25609](http://old.minfin.ru/en/statistics/fedbud/?id_38=25609) (accessed 22 January 2018)

<sup>31</sup> <https://www.vedomosti.ru/business/articles/2016/07/13/648963-stoimost-sili-sibiri>

<sup>32</sup> Экспортная пошлина на нефть в РФ с 1 января повышена до \$111,4 за тонну, Interfax, 1 January 2018, <http://www.interfax.ru/business/594194>. Assuming 7.3 bbl per tonne, this translates into an export duty of \$15.26/bbl. Dividing \$1 billion by \$15.26/bbl yields 65.5 million bbl, or 179.4 thousand bpd [65.5 million bbl ÷ 365 days]. 2016 Russia crude oil export figure of 5.2 million bpd obtained from the Energy Information Administration, "Russia exports most of its crude oil production, mainly to Europe," 14 November 2017, <https://www.eia.gov/todayinenergy/detail.php?id=33732>

<sup>33</sup> Газпром построит 1,38 тыс. км газопровода "Сила Сибири" до конца 2017 г., Metalinfo.ru, 27 December 2017, <http://metalinfo.ru/ru/news/99475>



## 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 an importing European country tend to decrease when that country reduces its dependence on gas supplied from Russia.<sup>34</sup> The biggest pricing benefit comes from the initial diversification away from reliance on a single monopoly 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 a floating storage regasification unit (FSRU)—aptly named “Independence”—and secured a contract for LNG supplied by Statoil of Norway.<sup>35</sup> The terminal has also imported at least one LNG cargo from the U.S. 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 echoes the national spirit that ushered Lithuanians into the streets more than 25 years ago when the Lithuanian SSR 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 (Seputyte, 2014).<sup>36</sup> In 2016, the discount grew to 46% of 2014 prices.<sup>37</sup> 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, moving from -\$977 million to -\$379 million.<sup>38</sup> As such, nearly ¼ of the reduction in Lithuania’s current account deficit potentially came from more favorable gas purchase terms, which in turn were substantially

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<sup>34</sup> Hinchey (2018) analyzes the pricing relationship between Gazprom and its European clients through an Asymmetric Nash Bargaining framework. Essentially, the paper finds empirical evidence that Gazprom prices according to a country’s dependence on Russian supplied gas; the country’s distance from Russia; the volume of its imports; as well as whether it was formerly a USSR state or affiliate country. Hinchey, N. (2018). The Impact of Securing Alternative Energy Sources on Russian-European Natural Gas Pricing. *The Energy Journal* (forthcoming)

<sup>35</sup> The gas is sourced from the Snøhvit field off northern Norway. “Norwegian LNG on Way to Lithuania,” LNG World News, 3 June 2016, <https://www.lngworldnews.com/norwegian-lng-on-way-to-lithuania/>

<sup>36</sup> Seputyte, M. (2014). Lithuania Grabs LNG in Effort to Curb Russian Dominance. Bloomberg.

<sup>37</sup> Marsen, J. a. (2017). In Reversal, Neighbors Squeeze Russia's Gazprom Over Natural Gas Prices. Wall Street Journal

<sup>38</sup> “Lithuania,” CIA World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/geos/lh.html>

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 bestowed a privileged market position upon Gazprom.

### **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 significantly heightened degree of competition between suppliers. This competition would play out according to 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 China and India, where demand growth could potentially sop up seaborne gas supplies that would otherwise weigh upon 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 geo-economic tools can impact major gas flow patterns and prices. Furthermore, a gas geo-economics strategy does not exclusively impact the Russian treasury: 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 geo-economics strategies such as those we describe in this analysis, intensive diplomatic engagement will need to go hand in hand with infrastructure projects.

#### **A. Key Dynamic 1: U.S. LNG Exports and “Sunk Cost Logic”**

U.S. LNG supplies will play an increasingly important role in the European gas market due to their scale, gas-based pricing, and freely tradable nature. U.S. exporters already operate approximately 20 BCM/yr (~15 million tpa) of liquefaction capacity and another 73 BCM/yr (~54 mtpa) is poised to come online by 2020 as projects now under construction begin to enter service in late 2018.<sup>39</sup> 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.<sup>40</sup>

The present crop of U.S. LNG plants, which are primarily located on the Gulf Coast, sell cargoes globally, but 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 into and also is located within two

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<sup>39</sup> “The impact of US LNG on European gas prices,” Charles River Associates, January 2018, <http://www.crai.com/sites/default/files/publications/The-impact-of-US-LNG-on-European-gas-prices-010318.pdf>.

<sup>40</sup> “Russia’s Gazprom sets annual Europe, Turkey gas export record of 193.9 Bcm,” S&P Global/Platts, 3 January 2018, <https://www.platts.com/latest-news/natural-gas/london/russias-gazprom-sets-annual-europe-turkey-gas-21959046>

weeks' sailing time of the U.S. LNG export facilities.<sup>41</sup> Geographical proximity matters because flexible U.S. 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 U.S. LNG supplies' ability to influence gas pricing in Europe. On one hand, there are pessimistic assessments such as that offered by Valery Nemo, deputy head of contract structuring and price formation at Gazprom Export, who in 2016 characterized U.S. LNG exports as sure to lose money during the next 20 years.<sup>42</sup> Yet Nemo'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.<sup>43</sup> The switch is arguably geared toward helping Gazprom's planned Baltic LNG project near St. Petersburg compete with U.S. shipments to Europe.<sup>44</sup> Ultimately, Gazprom's broader patterns of statements and actions suggest its management is deeply unsettled by the prospect of larger—and more sustained flows of US LNG into Europe.

A logical question here is *“why would the world's largest single gas reserve holder and one of its lowest cost suppliers—endowed with an extensive and largely amortized pipeline system—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 U.S. market and how this translates into practical decisions on whether or not to liquefy and export gas. These export decisions by U.S. 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.

U.S. 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 re-gasification costs. This approach—which Platts dubs “sunk cost logic”—means that while LNG producers must bear the fixed costs of financing a multi-billion dollar liquefaction plant, their transactions are driven by the margin they can make aside from those sunk costs.

Consider the following simplified example: an LNG plant can procure gas at the Henry Hub spot price of \$3/mmbtu, while 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 [\$3 for gas acquisition, \$1 to ship the gas, and \$0.50 to regasify it]. 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 [\$5.50/mmbtu sale price - \$4.50/mmbtu in variable costs]. 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

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<sup>41</sup> An LNG carrier steaming at 15 knots from the U.S. Gulf Coast can reach Spain in 13 days, but would take 28 days to reach Shanghai via the Panama Canal. Data from Sea-Distances.org, <https://sea-distances.org/> (accessed 16 January 2018)

<sup>42</sup> “US LNG exports to be loss-making with '100% probability': Gazprom,” Platts, 27 May 2016, <https://www.platts.com/latest-news/natural-gas/london/us-lng-exports-to-be-loss-making-with-100-probability-26452120>

<sup>43</sup> Газ для сжижения избавили от регулирования, Kommersant, 28 December 2017, <https://www.kommersant.ru/doc/3512398>

<sup>44</sup> See, for instance Kenneth Rapoza, “To Counter U.S., Russia Allows Gazprom To Sell LNG 'At Any Price',” Forbes, 28 December 2017, <https://www.forbes.com/sites/kenrapoza/2017/12/28/to-counter-u-s-russia-allows-gazprom-to-sell-lng-at-any-price/#69c6680418ec>

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.

#### Exhibit 4: Sunk Cost Logic Illustrated

|  | Liquefaction fee treated as a variable cost |               | Liquefaction fee treated as a sunk cost |               |
|--|---|---------------|---|---------------|
|  | Liquefy                                     | Don't Liquefy | Liquefy                                 | Don't Liquefy |
| Feed gas purchase price (Henry Hub, USD/mmbtu)         | \$3.0                                       | \$3.0         | \$3.0                                   | \$3.0         |
| Liquefaction fee, USD/mmbtu                            | \$2.5                                       | \$2.5         | \$2.5                                   | \$2.5         |
| Transportation fee, USD/mmbtu                          | \$1.0                                       | \$1.0         | \$1.0                                   | \$1.0         |
| Regas fee, USD/mmbtu                                   | \$0.5                                       | \$0.5         | \$0.5                                   | \$0.5         |
| Destination gas price, USD/mmbtu                       | \$5.5                                       | \$5.5         | \$5.5                                   | \$5.5         |
| <b>Profitability</b>                                   |   |               |   |               |
| Gross revenues, USD/mmbtu                              | \$5.5                                       | \$0.0         | \$5.5                                   | \$0.0         |
| Variable costs, USD/mmbtu                              | (\$7.0)                                     | \$0.0         | (\$4.5)                                 | \$0.0         |
| Fixed Costs, USD/mmbtu                                 | \$0.0                                       | \$0.0         | (\$2.50)                                | (\$2.50)      |
| Profit/Loss (pre-tax), USD/mmbtu                       | (\$1.5)                                     | \$0.0         | \$1.0                                   | \$0.0         |
| "Contribution margin" to offset fixed costs, USD/mmbtu | (\$1.5)                                     | \$0.0         | \$1.0                                   | \$0.0         |
| Rational to export LNG?                                | No  | No            | Yes                                     | No            |

Source: S&P Global/Platts

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 U.S. LNG exports are likely to flow to Europe, exerting downward pressure on local gas prices, and by extension, Russian gas revenues and customers’ willingness to enter into long-term oil-linked supply agreements.

U.S. LNG producers have to date committed to long-term deals with take-or-pay obligations that cover about 80% of their terminals’ outbound capacity.<sup>45</sup> The largest U.S. LNG producer has signed 20-year take-or-pay contracts that cover 87% of the capacity it has operational and under construction.<sup>46</sup> Charles River Associates describes the resulting situation as one in which “liquefaction fees are effectively unavoidable costs until this capacity is utilized.”<sup>47</sup> And as a result, 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 reach their 80% utilization threshold, terminal operators have incentives

<sup>45</sup> “The impact of US LNG on European gas prices,” Charles River Associates, January 2018, <http://www.crai.com/sites/default/files/publications/The-impact-of-US-LNG-on-European-gas-prices-010318.pdf>. See also Cheniere 3Q2017 Investor Presentation, 14 November 2017, <http://phx.corporate-ir.net/phoenix.zhtml?c=101667&p=irol-presentations> (Slide 21)

<sup>46</sup> Cheniere 3Q2017 Investor Presentation, 14 November 2017, <http://phx.corporate-ir.net/phoenix.zhtml?c=101667&p=irol-presentations> (Slide 21)

<sup>47</sup> “The impact of US LNG on European gas prices,” Charles River Associates, January 2018, <http://www.crai.com/sites/default/files/publications/The-impact-of-US-LNG-on-European-gas-prices-010318.pdf>.

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 U.S. 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 3Q2017, the latest for which data are available.<sup>48</sup> 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/yr of gas would be subject to "sunk cost logic" trading decisions: 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 coming onto 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 U.S. 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/yr of gas before they have fulfilled the volumes they are contractually committed to under the take-or-pay agreements used to anchor the plants.

## **B. 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 transpire between three core parties: (1) U.S.-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.<sup>49</sup>

Russia has massive spare gas capacity, estimated by S&P Global Platts to be 170 BCM/yr.<sup>50</sup> 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

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<sup>48</sup> Capacity utilization rate calculated as follows: Company reported exporting 44 cargoes with an energy content of 160 trillion BTU in 3Q2017 (Company 3Q2017 Investor Presentation, 14 November 2017). These exports all came from the company's Sabine Pass facility, with four operational trains capable of producing 4.5 mtpa each, for a total implied annual capacity of 18 mtpa. Each tonne of LNG contains 53.38 million BTU (International Gas Union, "Gas Conversion Pocketbook."). Thus, 160 trillion BTU ÷ 53.38 MMBTU/tonne yields slightly less than 3 million tonnes of LNG exported for the third quarter of 2017, implying an annualized capacity of 12 million tonnes or two-thirds of the Sabine Pass facility's current capacity (12 million tonnes per year run rate ÷ 18 million tonnes per year total capacity).

<sup>49</sup> Gas supplies from North Africa appears poised to decrease in both absolute and relative terms over the next decade as aboveground political and security challenges (particularly in Libya), rising domestic demand (Algeria), and stagnant gas demand in Southern Europe weigh on near-term demand and reduce incentives for long-term investment. For a detailed analysis of the situation in Algeria, see Ali Aissaoui, "May 2016: Algerian Gas: Troubling Trends, Troubled Policies," Oxford Institute for Energy Studies, OIES Paper: NG 108, May 2016, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/05/Algerian-Gas-Troubling-Trends-Troubled-Policies-NG-108.pdf>

<sup>50</sup> Stuart Elliott and Fabio Reale, "US LNG vs. Pipeline Gas: European Market Share War?" S&P Global/Platts, April 2017, <https://www.platts.com/IM.Platts.Content/insightanalysis/industrysolutionpapers/sr-us-lng-pipeline-gas-european-market-share.pdf>



240 BCM/yr (over 100 BCM/yr via Brotherhood, 33 BCM/yr via Yamal-Europe, 55 BCM/yr via Nord Stream-1, and 16 BCM/yr via Blue Stream into Turkey).<sup>51</sup> With exports to the Far Abroad (i.e. non-FSU Europe and Turkey) equally 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 high transit country risk and Naftogaz Ukraina is considering imposing steep transit fees on Russian gas.<sup>52</sup>

Matters are further complicated by recently adopted U.S. sanctions that specifically target energy export pipelines emanating from the Russian Federation by giving the U.S. President authority to impose sanctions on any person who provides goods, services, technology, information, or other material support for such projects.<sup>53</sup> 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 U.S. and Qatar as the key potential sources of incremental supplies over the next five years. U.S. 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 U.S.-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/yr).<sup>54</sup> Qatar has an advantage over other suppliers in terms of delivered gas cost, owing to its massively productive wells, liquids-rich production, relatively small land use constraints on facility expansion, and first-mover advantage.

First, 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.<sup>55</sup> 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.<sup>56</sup>

Furthermore, associated liquids enhance the economics of production from the North Field. To draw again on the Qatar vs. Novatek/Yamal LNG example, consider that Qatargas’s Ras Laffan assets, which account for about half of Qatar’s total LNG output, produce more than 5 times as

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<sup>51</sup> “Gas Pipelines,” Gazprom, <http://www.gazprom.com/about/production/projects/pipelines/> (accessed 18 January 2018), See also Sylvie Cornot-Gandolphe, “The US Natural Gas Exports: New rules on the European gas landscape,” IFRI Center for Energy, June 2016, [https://www.ifri.org/sites/default/files/atoms/files/etude\\_cornot\\_gaz\\_naturel\\_en\\_europe\\_en\\_okdb\\_complet-reduit\\_ok.pdf](https://www.ifri.org/sites/default/files/atoms/files/etude_cornot_gaz_naturel_en_europe_en_okdb_complet-reduit_ok.pdf) (P.44)

<sup>52</sup> See, for instance Thierry Bros, “Has Ukraine scored an own-goal with its transit fee proposal?” Oxford Institute for Energy Studies, November 2016, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/11/Has-Ukraine-scored-an-own-goal-with-its-transit-fee-proposal.pdf>

<sup>53</sup> H.R.3364 - Countering America’s Adversaries Through Sanctions Act, passed on 2 August 2017, <https://www.congress.gov/bill/115th-congress/house-bill/3364/text#toc-HAFCC2147AB734201B5987DBC1FF39F64>

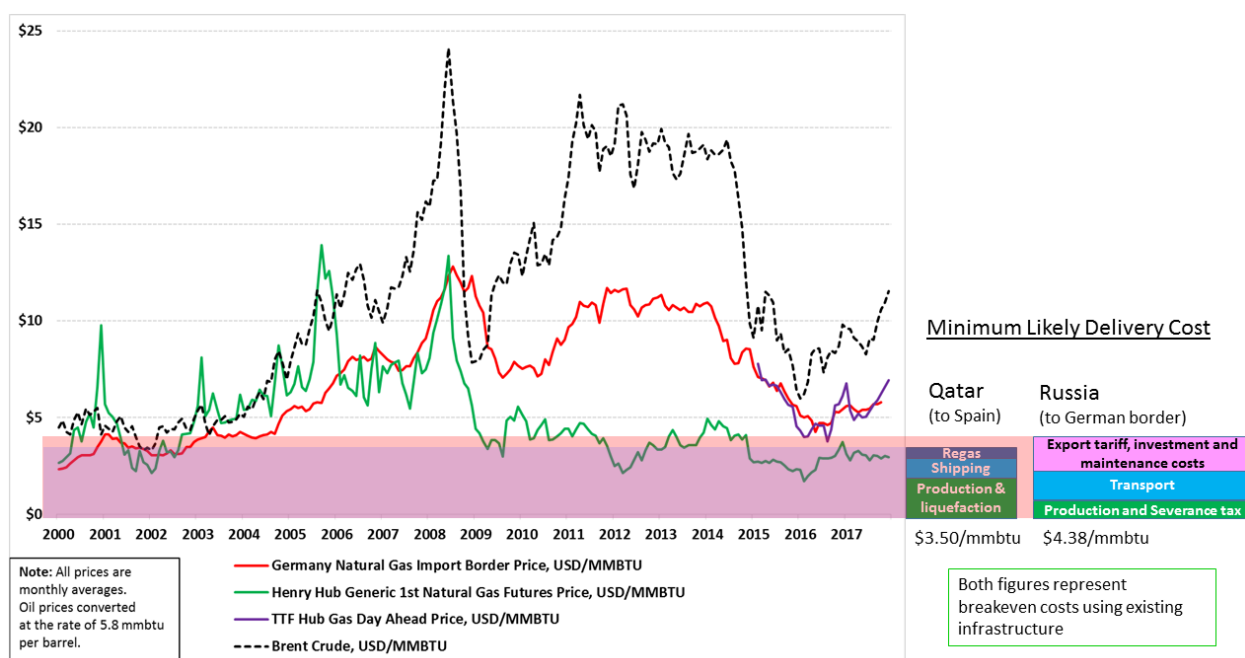
<sup>54</sup> “Qatar to boost LNG production to 100 Mtpa,” LNG World News, <https://www.lngworldnews.com/breaking-qatar-to-boost-lng-production-to-100-mtpa/>

<sup>55</sup> <http://www.qatargas.com/english/operations/offshore>

<sup>56</sup> “Harnessing the Energy of the Far North,” Investor Presentation, Novatek, 16 November 2016, Slide 26. <http://www.novatek.ru/en/investors/presentations/>

much condensate and associated liquids per unit of dry gas as Novatek's Yamal LNG wells are projected to.<sup>57</sup> 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 which 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.<sup>58</sup>

**Exhibit 5: Minimum Delivery Cost of Qatari LNG and Russian Pipeline Gas vs. Recent European Prices**



<sup>57</sup> Data drawn from "The Trains," Qatargas, <http://www.qatargas.com/english/operations/lng-trains> and "About the Project," Yamal LNG, <http://yamallng.ru/en/project/about/> (accessed 12 January 2018). Condensate tonnage converted to barrels at the rate of 8.3 bbl of condensate per tonne. "Glossary and Conversions," Karoon gas Australia, <http://www.karoongas.com.au/investors/glossary-conversions/>. Model available upon request.

<sup>58</sup> Sam Duran, "Implications of a Tightening Ethane Supply and Demand Balance Part 2," Point Logic Energy, 10 February 2016, <https://www.pointlogicenergy.com/market-news/Get-the-Point/2016/2016-02-10-Implications-Tightening-Ethane-Supply-Demand-Part2.html>



Source: Bloomberg, Gazprom, Kommersant, IHS

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, per unit of energy more valuable than gas, would give it major staying power. We have constructed a simple model using data from Fattouh et al. (2015) to estimate how low liquids and gas prices would need to go before the net present value ("NPV") would become negative for a new Qatari LNG train with a 20-year economic life. Even assuming a 15% discount rate (i.e. minimum rate of return), such a facility could, including debt service costs, still offer a net positive return with liquids at \$25/bbl and LNG selling for \$2.80/mmbtu in the European end market over *the entire 20-year project life*—a price situation approximating market collapse (**Exhibit 6**).

**Exhibit 6: Economic Competitiveness of a Hypothetical 11 mtpa LNG Project in Qatar<sup>59</sup>**

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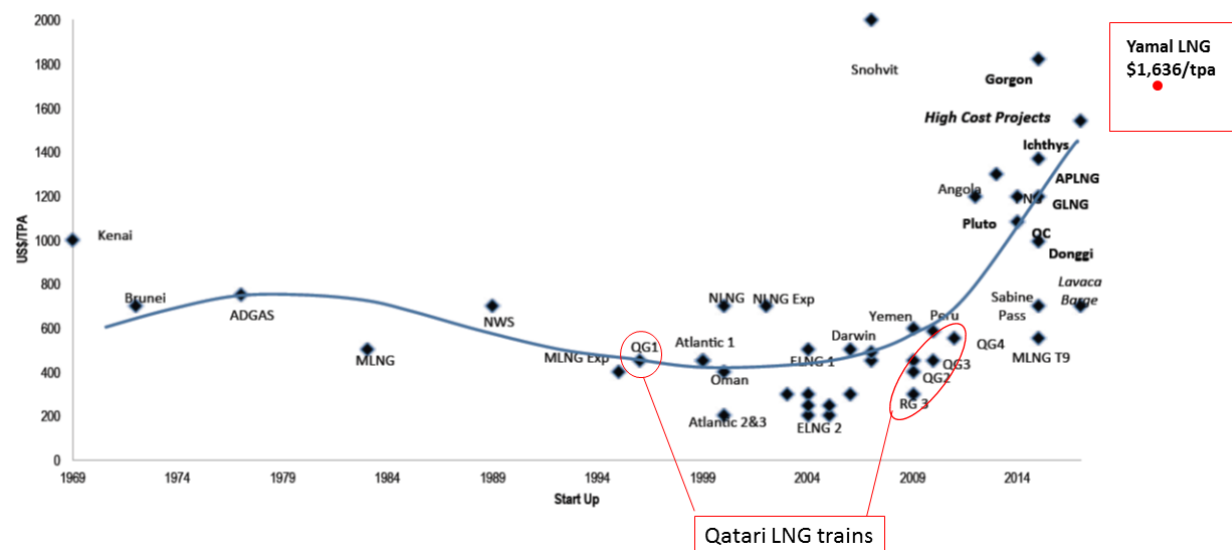
<sup>59</sup> Model available upon request.

| <b>Output</b>                              |                  |
|--|------------------|
| LNG Production, BCM/yr                     | 15.2             |
| LNG Production, mtpa                       | 11.2             |
| LNG Production, mmbtu/yr                   | 542,640,000      |
| Condensate and NGL production, bpd         | 128,000          |
| <b>Costs &amp; Realized Pricing</b>        |                  |
| Average liquids price, \$/bbl              | \$25.00          |
| LNG destination Price, \$/mmbtu            | \$2.80           |
| Gas Production Cost, \$/mmbtu              | \$0.22           |
| LNG debt service cost, \$/mmbtu (averaged) | \$0.57           |
| LNG liquefaction cost, \$/mmbtu            | \$0.98           |
| Liquids fractionation cost, \$/bbl         | \$4.00           |
| LNG transport cost, \$/mmbtu               | \$1.25           |
| LNG regas cost, \$/mmbtu                   | \$0.50           |
| Net realized LNG price, \$/mmbtu           | -\$0.72          |
| <b>Revenue</b>                             |                  |
| Annual net LNG Revenue                     | -\$390,658,187   |
| Annual net liquids revenue                 | \$981,120,000    |
| Total Annual Net Revenue                   | \$590,461,813    |
| <b>Project Life</b>                        |                  |
| Economic Life of Project                   | 20               |
| <b>Cumulative Financial Outcome</b>        |                  |
| Cumulative net revenue                     | \$11,809,236,254 |
| Discount Rate                              | 15.0%            |
| NPV, Billion USD                           | \$0.1            |

Source: Fattouh et al, "The US Shale Gas Revolution and Its Impact on Qatar's Position in Gas Markets," 2015, SIPA; Authors' Estimates

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 (**Exhibit 7**). 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, Baltic Sea, and Adriatic Sea. Highlighting the advantages conferred by legacy infrastructure capable of scaling up cost-effectively, consider that Qatari LNG facilities were built at a cost of \$600 per tonne per year ("tpa") or less. In contrast, Russia's Yamal LNG project cost approximately \$1,636/tpa, based on data from Yamal LNG, the project developer.

## Exhibit 7: Qatari LNG Projects Enjoy Low Construction Costs and Lower Fixed Cost per Tonne of Liquefaction Capacity



Source: Songhurst (2014), Yamal LNG

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* facilities.<sup>60</sup> 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 2/3 of Qatar's *total* national production) that could theoretically be made available for export by reforming domestic prices and rationalizing residential and industrial usage. The most concrete estimate we have located to date of potential effects of domestic gas re-pricing on demand--and implicitly, exportable gas supply--comes from a group of scholars at NMBU in Norway.<sup>61</sup> 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.<sup>62</sup> 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/yr of gas to China, if operated at full capacity).

<sup>60</sup> Ron Bousso and Dmitry Zhdannikov, "Exclusive: Energy giants court Qatar for gas expansion role despite crisis," Reuters, 5 July 2017, <https://www.reuters.com/article/us-gulf-qatar-lng-exclusive/exclusive-energy-giants-court-qatar-for-gas-expansion-role-despite-crisis-idUSKBN19Q2HA>

<sup>61</sup> The NMBU team used the LIBEMOD model (LIBeralization MODEL for the European Energy Markets) to test several scenarios. Detailed information on the model is available at "LIBEMOD," Frischsenteret, <http://www.frisch.uio.no/ressurser/LIBEMOD/>

<sup>62</sup> Ibid.

However, measure aimed at reducing domestic gas use would almost certainly rapidly run afoul of politics. 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.<sup>63</sup> Gazprom data show that from 2007 to 2012, the company’s realized price for domestic gas sales more than doubled in dollar terms (from \$53/MCM to \$112/MCM), but still significantly lagged 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, U.S. 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.

### **C. 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, which for some of its customers have been in place for 40 years and running. Perhaps the biggest impact on Gazprom’s agreements from the emergence of U.S. shale gas 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 vs. gas basis. By 2016, 66% of gas was priced using the gas vs. 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 reap 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. Where higher gas infrastructure connectivity and access to LNG supplies—whether from the U.S., Qatar, or another source—come in is that by displacing higher cost gas sources, they 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 held equal, it makes less money per unit of gas sold. This leaves it facing the decision to either (A) reduce gas supplies to bring prices back up (“defending the price”) or (B) send more gas into the market to drive out higher cost suppliers and try to make back lost rent through higher sales volumes (“defending market share”). If other

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<sup>63</sup> <https://pdfs.semanticscholar.org/dd75/edb5559bdc3f9742caa249a20939385a4078.pdf>

low-cost suppliers persist in maintaining high levels of supply—as happened with U.S. shale in the global crude oil market over the past three and one half years—then a supply glut keeps prices low. And if a price war played out in that way, Gazprom would effectively be trading against itself by increasing supplies, as doing so would simply drive the market clearing price closer to the company’s marginal cost of supply.

#### **D. 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 U.S. and other LNG exporters. To the contrary, it also potentially includes Gazprom and other Russian suppliers. While Gazprom is the only Russian entity that is allowed to export natural gas via pipelines, following a strong push from domestic natural gas suppliers, Russia has recently allowed other companies to export natural gas in the form of LNG.<sup>64</sup>

Until recently this would be of no consequence for the European market. The only Russian LNG exporter (prior to December 2017) was Sakhalin Energy, owned by Gazprom, Shell, Mitsui, and Mitsubishi.<sup>65</sup> Due to its location, Sakhalin Energy primarily supplies LNG to Japan, South Korea and China.

However, on December 8<sup>th</sup>, 2017 the new Yamal LNG terminal began to export natural gas.<sup>66</sup> The new operation is owned by Russia’s second-largest gas producer, Novatek, Total, CNPC, and the Silk Road Fund (China).<sup>67</sup> Yamal LNG is marketed as Russia’s window of opportunity to deliver natural gas to the Asian market. However, due to weather limitations delivery to Asia will only be possible between the months of July and December. In the remaining months, which includes 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.<sup>68</sup> This has important implications for Russia’s bargaining position against its European customers.

At first glance, Yamal LNG could potentially increase overall Russian gas supplies to European markets, and more so if new, U.S. funded infrastructure allows easy regasification and transport. But the devil is in the details. Since Yamal LNG is produced and exported by Novatek and not Gazprom, as soon as it reaches European shores, it will likely become new source of competition to Gazprom’s sales, especially since the two companies have already begun intensely competing

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<sup>64</sup> Vladimir Soldatkin and Olesya Astakhova, “Russia’s Rosneft set for global gas tussle with Gazprom,” Reuters, 30 June 2017, <https://www.reuters.com/article/russia-rosneft-gas/russias-rosneft-set-for-global-gas-tussle-with-gazprom-idUSL8N1JR1V1>

<sup>65</sup> <http://www.sakhalinenergy.ru/en/company/overview.wbp>

<sup>66</sup> <https://www.total.com/en/energy-expertise/projects/oil-gas/lng/yamal-lng-cold-environment-gas>

<sup>67</sup> <http://yamallng.ru/en/project/about/>

<sup>68</sup> <https://www.ft.com/content/8412ba8c-6ace-11e7-b9c7-15af748b60d0>

in Russia's domestic gas market.<sup>69</sup> 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 first would have to broker a compromise between Gazprom and Novatek, complicating its ability to use Gazprom as a lever to pressure entities in Europe.

### **E. Key Dynamic 5: How Gas Price Competition Interacts With Sanctions Against Russia**

The same short-run marginal cost logic that currently governs U.S. LNG export decisions can also apply 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" (basically non-FSU Europe and Turkey) 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 deliver to Germany as just under \$4/mmbtu.<sup>70</sup> Regardless, Gazprom can deliver gas into Europe at a short-run marginal cost lower than that of any competitor aside from Qatar.

But to sustain a price war, Gazprom would have to persuade the Kremlin to significantly reduce the tax burden Moscow 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. Western Europe and Turkey account for about half of Gazprom's sales volumes, but comprise nearly 75% of "post-tax revenues," a proxy for actual profits.<sup>71</sup>

As such, depressing prices in the Far Abroad when the company has no other market outlets capable of offsetting the profits lost will make it much more difficult to finance CAPEX requirements from cashflow—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 export pipelines out of Russia are likely to seriously chill Gazprom's ability to access international capital markets to help finance these projects, whose combined upstream and pipeline-related costs could exceed \$75 billion.<sup>72</sup> Gazprom may ultimately secure financing from Chinese gas buyers, but the terms will likely be tough and not particularly profitable. CNPC has already

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<sup>69</sup> James Henderson and Tatiana Mitrova, "The Political and Commercial Dynamics of Russia's Gas Export Strategy," p. 22.

<sup>70</sup> James Henderson and Tatiana Mitrova, "The Political and Commercial Dynamics of Russia's Gas Export Strategy," OIES, September 2015, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2015/09/NG-102.pdf> (P.52)

<sup>71</sup> Authors' calculations using company data, spreadsheet available upon request.

<sup>72</sup> Lynn-Yuqian Lin, "Can Gazprom deliver Power of Siberia gas to China by 2020?" Wood Mackenzie, 6 September 2017, <https://www.woodmac.com/news/opinion/gazprom-power-siberia-2019/>

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.<sup>73</sup>

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 workable 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 U.S. 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 both 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 the project's net present value positive.<sup>74</sup>

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 for the project's life in order for its NPV to be positive.<sup>75</sup> 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 up to the test of time amid continued low global gas prices.<sup>76</sup> 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 make 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 what the Power of Siberia gas is expected to price for at the Shanghai city gate.

When Power of Siberia enters service, if CNPC ends up being forced to take losses on its Russian gas supplies, there may arise significant pressure to renegotiate the contract's pricing and/or volume terms. 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

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<sup>73</sup> Michael Leyveld, "China-Russia Project Stalls as Energy Prices Plunge," Radio Free Asia, 25 January 2016, [http://www.rfa.org/english/commentaries/energy\\_watch/china-russia-01252016152633.html](http://www.rfa.org/english/commentaries/energy_watch/china-russia-01252016152633.html)

<sup>74</sup> Pierre Noël, "The Power of Siberia natural-gas project: commercial or political?" IISS, 30 January 2017, <https://www.iiss.org/en/politics%20and%20strategy/blogsections/2017-6dda/january-7f20/power-of-siberia-2a1d>

<sup>75</sup> Ibid.

<sup>76</sup> Alec Luhn and Terry Macalister, "Russia signs 30-year deal worth \$400bn to deliver gas to China," The Guardian, 21 May 2014, <https://www.theguardian.com/world/2014/may/21/russia-30-year-400bn-gas-deal-china>



negotiations to force changes to long-term supply agreements such as adoption of hub-based pricing that reflects competition among gas suppliers.<sup>77</sup>

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, and with it, the foundations of the country's comprehensive national power. Enhanced European ability to procure responsive and low-cost LNG supplies through gas pipelines and floating LNG import capacity as this paper advocates would further exacerbate Russian leaders' financial dilemmas.

The second path 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—be they the Altai pipeline or smaller ventures—would likely be Chinese. The “loans for gas” type of financial structure likely to emerge from the wrangle would probably dramatically reduce the project's profitability to Gazprom. There are analogues from the oil space 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 as much as 15% relative to spot market prices during that time.<sup>78</sup>

## **Conclusion**

The policies discussed in this paper boil down to one core objective: increasing supply diversity and competition. The U.S. should ultimately be indifferent to the source of Europe's gas molecules, so long as they come through—or could 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, as long as it diversifies European gas supplies away from dependency on Russian-controlled pipeline supplies, it should be welcome from the U.S. perspective.

U.S.-backed investments and other financial support for the 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 flow 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 U.S.-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 loss of inframarginal rents on gas and forced self-funding of export diversification projects.

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<sup>77</sup> Christoph Steitz, “UPDATE 2-E.ON agrees price cut with Gazprom, raises outlook,” Reuters, 29 March 2016, <https://www.reuters.com/article/e-on-gazprom-gas/update-2-e-on-agrees-price-cut-with-gazprom-raises-outlook-idUSL5N1713QG>

<sup>78</sup> See, for instance “Ecuador aún vende crudo al precio fijado por Petrochina,” 16 November 2017, <https://lahora.com.ec/noticia/1102114535/ecuador-aun-vende-crudo-al-precio-fijado-por-petrochina>

The gas geoeconomics plan taps into strong sentiments by certain U.S. 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 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 Fiscal Year 2018 Federal budget and about 1% of anticipated defense spending in that year. And the spend 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, U.S. jump start money would be progressively "sunsetting" out as private funds took over and a more broadly liberalized gas marketplace bolstered European resilience in the face of potential gas coercion by Russia.

As Gen. Michael Hayden, former NSA Director, recently told the Atlantic Monthly: *"Sometimes you have successful covert operations that you wish hadn't succeeded."*<sup>79</sup> The ultimate collateral economic consequences for Russian interests of a more robust U.S.-led gas geoeconomics strategy may make Russia's leadership wish it had not launched the invasion of Crimea, the war in eastern Ukraine, and the influence operations against the 2016 U.S. presidential election and democratic processes across Europe.

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<sup>79</sup> Quoted in Julia Ioffe, "What Putin Really Wants," The Atlantic Monthly, January/February 2018 issue, <https://www.theatlantic.com/magazine/archive/2018/01/putins-game/546548/>