

Macro Notes – Europe’s National Gas Conundrum



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Benjamin Hilgenstock, Economist, bhilgenstock@iif.com, @BHilgenstockIIF
Elina Ribakova, Deputy Chief Economist, eribakova@iif.com, @ElinaRibakova

- Natural gas imports from Russia have fallen sharply, and storage levels are extremely low.
- Europe’s high dependence on the country creates vulnerabilities and limits policy options.
- In the short term, Europe would likely be able to manage even in case of a full disruption.
- But a full replacement of Russian imports does not seem feasible for a number of reasons.
- Among them are infrastructure constraints and the lack of alternative supplier capacities.
- Thus, politically and/or economically painful demand-side adjustments would be needed.
- Nonetheless, Europe should begin to invest in reducing vulnerabilities while there is time.

As part of our publication series on the impact of existing and potential future sanctions on Russia, in this **Macro Notes**, we take a closer look at European dependence on Russian natural gas imports and options for supply diversification. The fact that EU countries receive 32-35% of their total imports (including LNG) from Russia substantially limits the Union’s foreign policy options as far as the conflict at Ukraine’s Eastern border is concerned. And while any sanctions affecting the free exchange of goods—such as direct measures imposed on exports or restrictions on Russian institutions’ access to global payments systems—are a challenge for Europe in the best of times, current record-high natural gas prices only exacerbate the problem. Based on our analysis of the current situation as well as natural gas supply diversification options, we conclude that European countries will likely be able to manage a disruption of Russian exports over the course of the coming months. However, in the medium run—due to a number of issues, including extraction constraints, infrastructure shortcomings, and political factors—demand-side measures would be inevitable. While [yesterday’s decision](#) by the German government to suspend the certification of *Nord Stream 2*, by itself, should not have an effect on supplies, it increases the likelihood that Russia will not step-up natural gas exports to Europe anytime soon.

Exhibit 1. Gas imports from Russia have fallen, ...

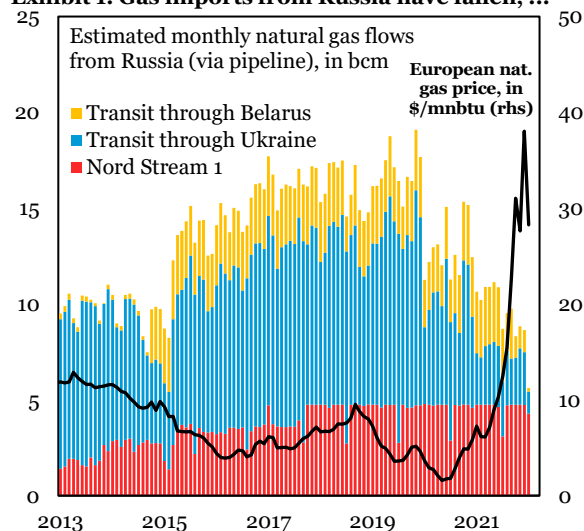
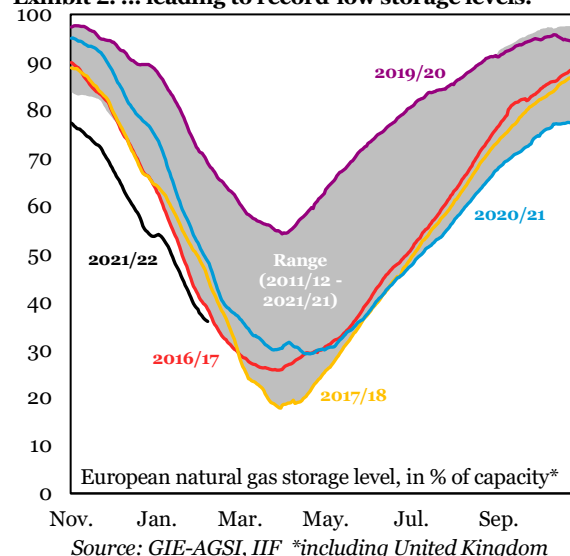


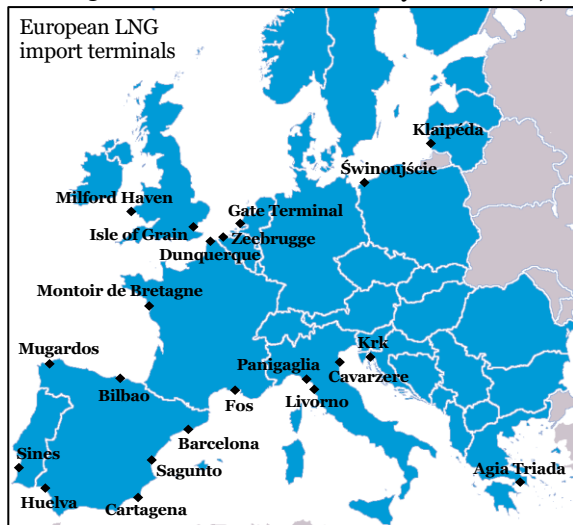
Exhibit 2. ... leading to record-low storage levels.



Europe’s current natural gas predicament is primarily the result of significantly smaller flows of Russian pipeline gas in 2021, especially in the second half of the year. While *Gazprom* appears to honor its long-term contractual obligations, the company has largely stopped selling additional amounts on the spot market. Based on daily data for seven cross-border interconnection points, we estimate that, relative to the average of the previous five years, monthly deliveries were 4.7 bcm (or 30%) lower in 2021H1 and 6.5 bcm (or 42%) lower in 2021H2 (Exhibit 1). The situation worsened further in January (-9.8 bcm or 64%) with flows via Nord Stream 1 below capacity for the first time outside of the usual July maintenance period. However, data for early February indicate that volumes are increasing again across interconnection points. Nonetheless, and despite a significant increase in imports of liquefied natural gas (LNG), storage levels in Europe are at an all-time low of 36% for this time of the year (Exhibit 2). This has had a meaningful impact on European gas prices, which remain almost 400% above their end-2020 level. While prices in the U.S (+70%) and Japan (LNG, +100%) have also risen significantly, it is evident that we are looking at a distinctly European problem.

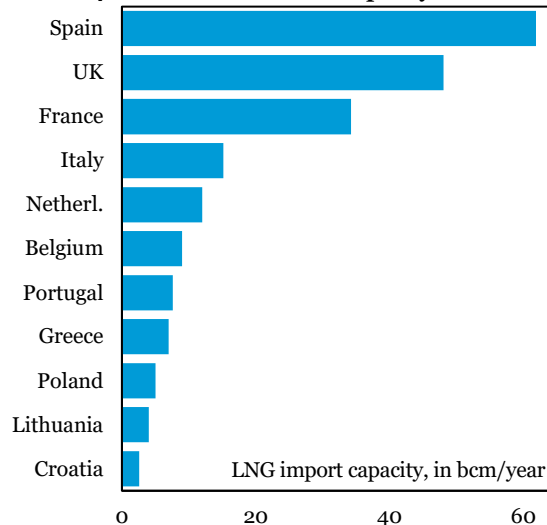
According to Brussels-based think tank [Bruegel](#), the European Union as a whole would likely be able to survive even a dramatic disruption of Russian gas imports in the **coming months**, with storage levels reaching a low of 140 TWh (or 12.5% of capacity) in April. This is, however, dependent on weather conditions, with an extremely cold rest of the winter possibly leading to empty storage facilities at the end of March. An additional complication arises regarding the distribution of the available supplies. For instance, most LNG import terminals are located in Western Europe (Exhibit 3)—with Spain, the United Kingdom, and France alone accounting for 70% of the total capacity (Exhibit 4)—and pipeline systems, especially in Central and Eastern Europe, remain focused on transporting gas from East to West, despite efforts in recent years to increase reverse-flow capacities. Additionally, technical factors and different standards restrict the ability to seamlessly distribute natural gas across the continent. Thus, certain countries could be forced to implement demand-reducing measures, although Europe-wide supply may be sufficient.

Exhibit 3. LNG terminals are unevenly distributed, ...



Source: EntsoG, IIF

Exhibit 4. ... while their overall capacity is sufficient.



Source: EntsoG, IIF

While the situation over the winter 2021/22 may be manageable, a look at the **medium-term** raises serious questions about Europe's ability to diversify import sources and reduce dependence on Russia. For a number of reasons—among them declining production within the EU itself, the critical role of natural gas in Europe's climate change-related efforts, and growing demand in other regions—Russia's importance is likely to grow in the absence of a concerted effort. Even then, options are more limited than they may appear at first glance. In the case of a halt of Russian imports altogether, EU countries would need to replace the equivalent of 1,600-1,700 TWh of pipeline gas or LNG—roughly one-third of their total imports (Exhibits 5 & 6). In the following paragraphs, we will take a look at several alternatives: i) an increase in the EU's own production; ii) larger imports from Norway and Algeria; iii) additional flows from Central Asia; and iv) heavier reliance on LNG imports, especially from the U.S. and Qatar.

- i) **Increasing EU production:** The challenge with expanding natural gas production within the EU itself is largely a political issue. Behind this lies the fact that most of the known reserves would need to be extracted through hydraulic fracturing (or "fracking"), which is highly unpopular in Europe and restricted by law in a number of countries. The *U.S. Energy Information Administration (EIA)* estimated in a 2013 [report](#) that Europe's technically-recoverable shale gas resources amount to roughly 17 tcm, with Poland (4.2 tcm), France (3.9 tcm), Ukraine (3.6 tcm), and Romania (1.4 tcm) possessing the, by far, largest quantities. This would be sufficient to cover Europe's total natural gas consumption, at 2021 levels, for roughly 40 years. While extraction in these areas would not begin for a considerable amount of time, more natural gas could be extracted from existing fields with spare capacity such as the *Groningen field* (Netherlands, 3 bcm), Europe's largest onshore field. However, production has decreased markedly in recent years due to concerns over earthquakes and the Dutch government has decided to end operations in 2022.
- ii) **Larger Imports from Norway or Algeria:** Norway and Algeria are the second and third-largest single suppliers of natural gas to EU countries, accounting for 15-16% and 8-10% of total imports in recent years, respectively. Both largely export via pipelines, with LNG making up around 5% of Norwegian and 20% of Algerien deliveries. While some analysts argue that *Norway* could step up production by around 13 bcm in 2022, Prime Minister Støre has stated that additional exports are not possible. Similarly, *Algeria* will not be able to provide larger quantities due to limited production capacity.

- iii) **Southern Gas Corridor and Central Asia:** A pipeline system connecting Azerbaijan’s natural gas fields to Europe without running through Russian or Iranian territory has long been an important project for the EU, and has materialized in a system of three separate pipelines which constitute the so-called *Southern Gas Corridor*: the South Caucasus Pipeline (SCP), the Trans-Anatolian Pipeline (TANAP), and the Trans Adriatic Pipeline (TAP). However, the system’s 16 bcm capacity is currently maxed out and, even if it were raised, there are doubts about Azerbaijan’s ability to step up production in a way that addresses Europe’s needs. As far as *Central Asia* is concerned, pressure from Russia and domestic policy considerations have prevented exports to Europe and gas is largely used for domestic consumption.

Exhibit 5. Russia remains Europe's largest supplier.

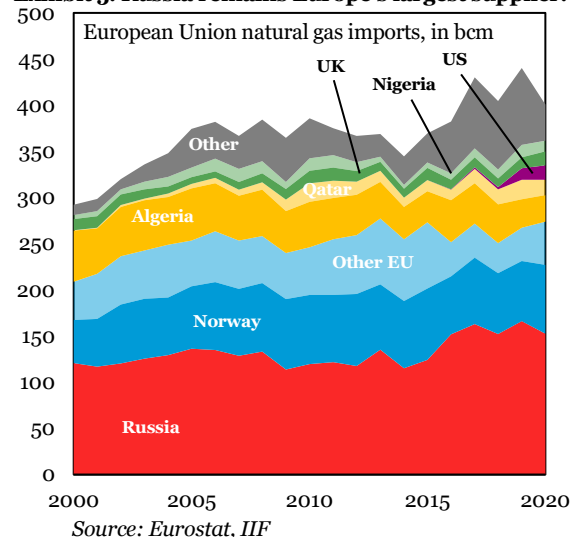
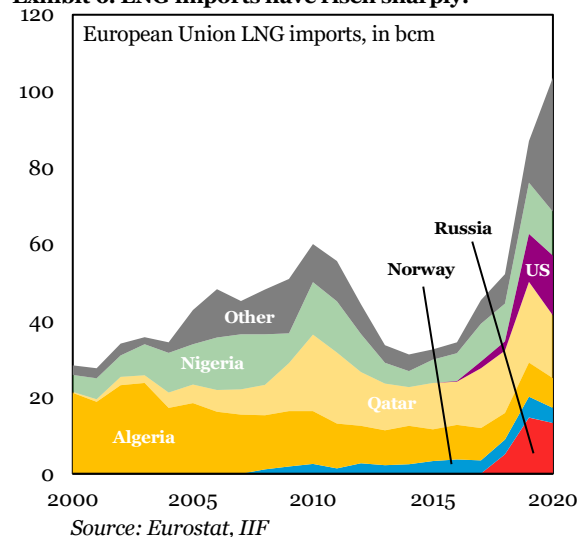


Exhibit 6. LNG imports have risen sharply.



- iv) **Heavier Reliance on LNG:** Replacing Russian natural gas imports with LNG—including from Europe’s current largest suppliers Algeria, Nigeria, Qatar, and the United States—poses a multi-faceted challenge that involves a) import terminal and pipeline infrastructure, as well as b) availability of LNG from existing sources.

- a) Based on 2021 numbers, European LNG terminals would be able to handle an additional 1,000 TWh (or roughly 50% of total capacity) which would go a long way to close the gap resulting from a potential disruption of Russian deliveries. But, as discussed above, the regional distribution of terminals and structure of European pipeline infrastructure would not necessarily allow distributing such amounts based on individual countries’ needs, in particular as those in Eastern Europe are generally more dependent on Russian imports.
- b) The main issue with the LNG option, however, is the limited availability of additional supplies on the market. Global liquefaction [capacity](#) is almost fully used up and LNG vessels are in very high demand as well. Furthermore, LNG is sold and acquired largely via long-term contracts so that European buyers would compete for a relatively small share of the market. Finally, additional demand of around 1,000 TWh, which represents roughly 20% of the existing global LNG market, would put strong upward pressure on prices. While favorable market conditions for producers and exporters will likely trigger additional investments in LNG infrastructure, their impact will not be felt for a considerable amount of time.

What does all of this mean now for Europe’s medium-term options to diversify natural gas imports and reduce their dependence on Russia? [Bruegel](#) concludes that, for the reasons laid out above, a full replacement of Russian natural gas will not be possible. In the event of a complete disruption of flows, the continent would have to rely on demand-side measures to address the situation. Some would be politically difficult such as a higher reliance on coal-fired power plants or a delay of Germany’s exit from nuclear energy; others would be economically painful such as forcing the closure of non-critical industries.

While it is clear that Europe will not be able to fully replace Russian natural gas imports for the foreseeable future, it should nonetheless begin to invest in strategies to gradually reduce its reliance on the country in light of geopolitical tensions that are unlikely to disappear any time soon. Among the possible measures are a) the construction of additional LNG import terminals, especially in Central and Eastern Europe; b) improvements to the continent’s pipeline reverse flow capabilities; c) enhanced storage capacities to limit risks from temporary disruptions; d) an acceleration of the transition to renewable energies; and e) if politically feasible, increased natural gas extraction within Europe via hydraulic fracturing.