

The US role in securing the European Union's near-term natural gas supply

The European Union's plan to phase out Russian natural gas imports by 2027 rests partly on increasing near-term imports of US liquefied natural gas. This will require a coordinated policy response that includes securing supplies from major exporters, global diplomacy, expanding import capacity, and alignment with Europe's climate goals.

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The Russian invasion of Ukraine has forced the European Union (EU) to consider how to rapidly shift away from its dependence on Russian energy imports — primarily natural gas. Consequently, the EU has said that they will end Russian energy imports (oil, gas, and coal) by 2027¹. In 2021, Russia supplied about 155 billion cubic meters (bcm) of natural gas to the EU, corresponding to nearly 40% of annual gas demand. Eliminating those imports in the near-term will involve a combination of expanding liquefied natural gas (LNG) imports, deploying renewable energy capacity, maximizing fuel flexibility such as keeping nuclear plants open and temporarily increasing coal use, a revitalized focus on reducing demand and increasing efficiency, deploying heat pumps to electrify building heat, and EU-led diplomacy to secure alternative supplies².

This is a monumental task — natural gas supplied 24% of EU energy demand in 2020, and is a major fuel source in the electricity, industrial, and residential sectors. The US, soon to become the global leader in LNG export capacity, is likely to play a major role in the future of EU energy security.

Here, we discuss key technical and geopolitical challenges in meeting European LNG needs in the near-term. First, we explore the technical feasibility of increasing near-term US LNG supplies to Europe based on recent global LNG trade data. Second, we discuss the critical role for EU diplomacy with Asia and other US LNG consumers in the developing world to temporarily re-route supplies to Europe. Third, we discuss how the EU can temporarily expand import capacity to receive additional LNG. Finally, we conclude with a discussion of how improving European energy security through increased US LNG exports presents an opportunity to simultaneously advance climate goals.

Technical feasibility

As part of a joint announcement of a US-European Commission (EC) task force

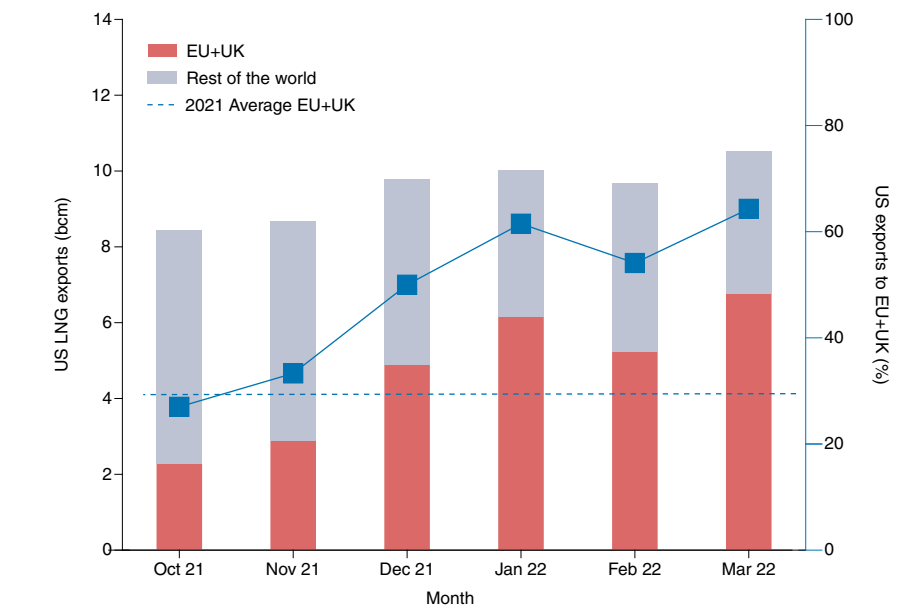


Fig. 1 | Monthly US LNG exports to Europe and the rest of the world. Europe (EU-27 + UK) is shown in orange, left axis, the rest of the world, gray, left axis. The fraction of US exports going to Europe is in blue, right axis. In all, 29% of US LNG exports went to Europe in 2021, shown by the blue dotted line. Data from US Natural Gas Monthly reports¹⁵.

to reduce Europe's dependence on Russian fossil fuels, the US announced that they will ensure additional LNG volumes to the EU market of at least 15 bcm in 2022. Furthermore, the EC will work with member states to guarantee demand for 50 bcm of additional US LNG until at least 2030³.

The feasibility of this target is not entirely clear; ultimately its practicality will be determined by the availability of spare export capacity in the US, and the capacity for EU countries to re-gasify the additional LNG. Fig. 1 shows the monthly US LNG exports to Europe (27 countries in the EU and the United Kingdom) over the six months spanning the fourth quarter of 2021 and first quarter of 2022 (ref. ⁴). Prior to the Russian invasion, European natural gas prices were already at record highs in

late 2021, mostly due to high winter demand coupled with low storage stocks. These high prices caused several LNG cargos bound for Asia to re-route to Europe.

For the first three months in 2022, over 60% of US LNG exports were delivered to Europe, compared to only 37% over the last three months of 2021. Both are significantly higher compared to the 2021 average of 29% of US LNG exports delivered to Europe. The 19 bcm of LNG delivered to Europe in the first three months of 2022 represents an increase of about 12 bcm over the same period in 2021, which is 80% of the commitment made in the US-EC announcement to procure an additional 15 bcm in all of 2022. Furthermore, two new liquefaction facilities in Sabine Pass and Calcasieu Pass, US, will be operating

in 2022, adding a combined 26 bcm of export capacity⁵.

If supply trends in the first quarter of 2022 continue, Europe could receive an additional 63 bcm of US LNG through the end of the year, a year-over-year increase of 51 bcm compared to 2021. However, that such an increase is theoretically possible does not mean it is practically feasible. Continued deliveries to Europe depend on several factors including demand flexibility from contracted Asian buyers, winter outlook in Asia and Europe, and spot market prices that make re-routing LNG cargos to Europe attractive.

Energy security through energy diplomacy

Of the major global exporters of LNG, the US and Australia have a structural advantage through flexible destination arrangements. Nearly two-thirds of the LNG in the US is sold on a free-on-board (FOB) basis, meaning that the buyer owns the LNG at the time it is loaded onto a ship at the export terminal⁶. This implies that re-routing supply to the EU requires negotiations only with the contracted buyers.

However, in the case of Qatar and Nigeria, most LNG is sold delivered-ex-ship where the buyer takes ownership of the LNG only after delivery, such that any re-routing of contracted LNG volumes to Europe will require consent from both the seller and buyer, which can inhibit flexibility.

This limitation was evident in the run-up to record high gas prices in Europe during the winter of 2021–2022. The first 9 months of 2021 saw 21 bcm of US LNG delivered to Europe, representing 26% of export volumes. However, the three-month average from January 2022 through March 2022 saw 60% of US LNG exports delivered to Europe, at an average price of over US\$30/MMBtu, compared to the long-run average of US\$4 – 8/MMBtu prior to 2021.

Therefore, while flexibility exists for US LNG exports, structural changes to reduce gas demand in the European economy and a mechanism to avoid a bidding war between European and Asian customers are still needed.

Diplomacy could be used to avoid a potential bidding war by facilitating mutually beneficial adjustments to existing long-term supply deals with Asian customers. The goal of diplomacy should be to work with major LNG consumers whose supplies are tied up in long-term contracts to temporarily accept lower deliveries. For example, Japan's national energy plan calls for a rapid shift from natural gas to renewable sources by 2030, reducing

LNG demand by 37 bcm by 2030. This plan would require re-starting all nuclear plants, expansion in solar and wind energy, and potentially a temporary increase in coal-based power generation. The EU could work with Japan to re-route contracted LNG volumes for 2022 in exchange for financial and trade incentives to accelerate Japan's energy transition. Achieving Japan's energy transition goals could bring up to 31 bcm of LNG to Europe, although much of this transition is unlikely to happen within the next year⁷.

Incentives for new destination countries can take several forms. First, the EU could offer to pay any penalty for buyers to cancel contracts to free up US LNG. Second, the EU could provide direct financial or technical assistance for buyers who wish to deploy clean energy in the near-term, bringing existing offline nuclear and/or coal capacity online, installing heat pumps, or offering preferential trade deals on European exports. Third, the US and EU governments could work with US LNG suppliers to ensure long-term supply through European investments in expanding or building new LNG terminals, specifying minimum annual contract volumes, and an assured demand over several years. Similar deals with other major destinations for US LNG, including South Korea, China, and India, could help the EU avoid paying high spot-market prices.

No country left behind

Any solutions to the gas crisis in Europe will have various impacts on US LNG customers in developing countries. In 2021, 26% of US LNG exports or 26 bcm were delivered to countries in South Asia, Latin America, and the Caribbean⁴. With continuing high demand in Europe, LNG prices might stay high. While the EU's member nations might collectively be able to pay a premium to secure gas supply, poorer countries like Brazil or India will be forced to reduce demand or switch to less clean fuels like coal or traditional biomass. Being less resilient to sudden supply disruption means that such forced changes could result in adverse economic or public health impacts.

Thus, an unintended consequence of the shock to the global gas market is that even as Europe accelerates its shift to clean energy, developing countries risk getting further left behind. A coordinated effort by the EU to re-route long-term LNG shipments and construction of new floating storage and regasification units (FSRUs) should be accompanied by outreach and support to those developing countries that would be affected by supply disruption. Similar to diplomatic negotiations with US

LNG buyers in Japan or South Korea, the EU could compensate developing nations for any loss of contracted LNG volumes or delayed infrastructure projects.

Expanding import capacity

A key short-term impediment to supplying Europe's natural gas needs is the availability of spare import capacity at European LNG re-gasification terminals. Here, there is good news and bad news. The good news is that average capacity utilization of LNG re-gasification terminals in the EU was only about 60% in 2021, indicating that there is significant spare capacity to increase imports^{6,8}.

The bad news is that much of this spare capacity is in Spain, with a total re-gasification capacity of 65 bcm and an average 2021 utilization of only 31%. Despite the potential to increase LNG imports by about 40 bcm, Spain is limited by pipeline capacity into central Europe. Thus, the presence of spare capacity in Spain is of limited use to the broader EU demand for natural gas without pipeline development. Outside of Spain and Portugal, the average EU re-gasification terminal utilization was 58% in 2021 — maximizing spare capacity at all these terminals could increase imports by at most about 40 bcm. Any increase in LNG imports beyond this limit could come through building new onshore or offshore (like Lithuania had done in 2014) re-gasification terminals, as recently announced by Germany, although they would not be operational until about 2025.

A key interim solution would be for the EU's coastal member countries to quickly commission new FSRUs and potentially lease existing FSRUs from other countries. While FSRUs do not increase gas supply, they serve to expand import capacity in the short-term as new floating facilities can be built in about a year, have fewer permitting and regulatory hurdles compared to onshore LNG import terminals, and be moved from one location to another. Globally, there were 43 FSRUs in operation in 2020, with a combined capacity of 236 bcm, significantly larger than EU imports from Russia. While most of these terminals are currently in operation, the EU is likely already exploring any available flexibility in existing contracts for temporary service in Europe.

US-EU cooperation on climate policy

The EU has been a global leader in developing strong climate policies such as the Fit for 55 plans even before the Russian invasion of Ukraine⁹. In addition to helping the EU diversify its LNG supply, the US can play a unique role in advancing EU climate

policy goals, thereby making US LNG particularly attractive.

In this context, reducing methane emissions from the LNG supply chain presents an opportunity to simultaneously advance the EU's ambitions and improve energy security^{10,11}. Recent policy proposals in the EU focus on target-based approaches to reduce methane through monitoring, record-keeping and verification (MRV) programs¹². Together with domestic efforts such as the draft US Environmental Protection Agency (EPA) rules to address methane emissions, increasing US LNG exports can be achieved while lowering life-cycle greenhouse gas emissions intensity¹³.

However, caution is necessary. The effectiveness of and trust in target-based approaches to address methane emissions depends on the availability of reliable, transparent, independent, and scientifically robust approaches to carbon and methane accounting frameworks. Governments should fund academic or other non-profit and independent institutions to provide reliable data to the global natural gas market. Without it, the world of methane accounting risks replicating the mistakes of carbon removal programs, which generated a lot of activity but inconclusive benefits¹⁴.

The COVID-19 pandemic has demonstrated the perils of an uncoordinated global response to global crisis in a deeply interconnected world, with most countries still struggling to reach pre-pandemic levels

of economic output or employment. The impacts of the Russian war on Ukraine will have similar far-reaching effects on global energy markets. Ensuring that developed and developing economies are supported throughout the invasion and its aftermath will require close attention. That this must be accomplished against a background of increasing urgency of climate action underscores the importance of developing integrated policies that reduce emissions while improving global energy security and resilience.

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Competing interests

The authors declare no competing interests.