

# GIES OCCASIONAL PAPER

The Global Energy Crisis | January 2023

## LNG: SAVIOUR OR A NEW PROBLEM IN THE MAKING?

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A month after the Russian invasion of Ukraine, the European Union (EU) announced in its REPowerEU program that Russian gas imports would be reduced by two-thirds by the end of 2022 and should stop altogether before the end of the decade. In response to this and EU sanctions against Moscow, Russia reduced gas flows to the EU to a trickle. Individual countries were blocked from gas supplies after they refused to pay in roubles, and technical issues were used as an excuse to reduce gas flows through Nord Stream until September when supply was fully terminated. Since then, the Nord Stream pipeline has been sabotaged and gas flows through the pipeline are not possible. These events made the gas situation in the EU dire. In total, the EU needs to replace 155 billion cubic meter (bcm) of Russian gas.<sup>1</sup> This has left the continent on a global hunt for alternative gas supplies.

Plans to expand existing pipeline infrastructure (see for example the planned expansion of the Southern Gas Corridor to Azerbaijan) were made, but a lot of redirection was aimed at increasing liquid natural gas, or LNG, import capacity. According to Eurostat, the share of LNG in the EU's gas imports has increased from 19% in October 2021 to 38% in November 2022. This share is expected to raise even further, as seven floating storage and regasification unit (FSRU) terminals are expected to come online before March in

Germany, the Netherlands, Estonia and Finland. In September, the Eemshaven FSRU terminal in the Netherlands opened and in mid-December, the German FSRU terminal in Wilhelmshaven started importing LNG. 19 more LNG terminals are planned across the EU.<sup>2</sup> This increased development of LNG importing infrastructure raises some questions about the impact on geopolitics and climate ambitions.

### **But first, what is LNG?**

LNG is natural gas turned liquid by cooling it to minus 162 degrees Celsius in a liquification terminal. After liquification, this LNG can be commercially transported using spherical shipping tankers as its volume has now shrunk to 1/600<sup>th</sup> its normal size.<sup>3</sup> Before LNG can be used for heating, electricity-generation and industrial processes, it needs to be regasified in a regasification terminal.

LNG is not a new technology, but dates back to 1873 Germany, when the first LNG compressor and refrigeration was engineered.<sup>4</sup> After the costs to produce LNG reduced, demand started to grow. The expansion of LNG has changed the gas market dynamics. The predominantly regional markets were complemented by a global market, as gas was no longer restricted to the physics of pipelines. LNG can be shipped to any market with

a regassification terminal, making it more flexible than piped natural gas.

The LNG technology is not without incidents. In 1944, more than 130 fatalities were reported when an LNG storage tank exploded in Cleveland, United States (US), and in 1973 there were 40 casualties during cleaning activities on an LNG storage tank in New York City. 27 people were killed in Skilda, Algeria when an LNG tank exploded in 2007.<sup>5</sup> An explosion at Freeport LNG (in Texas) in June 2022 fortunately did not lead to human casualties, but rendered the liquefaction terminal non-operational for the remainder of 2022. Freeport is the second-biggest LNG terminal in the US.

### The geopolitics of LNG

The EU has learned the hard way that gas pipelines can be used to exert pressure and is looking at LNG as a solution for its gas shortages. But LNG is not free from geopolitics. Today, there are only 21 LNG producers. Of these 21, only three have substantial production capacities: US, Qatar and Australia. By supply and demand, this means that these three can exert geopolitical pressure. Only limited volumes of Australian gas reach the European market (Australian LNG represented 0.005% of total LNG imports in the first 9 months of 2022), because of its geographical distance. Australian LNG is mostly supplied to the Asian market. Qatari and US LNG does reach the EU market in bulk, 18% and 30% respectively from all LNG imports in 2022, and can therefore result in more geopolitical pressure.<sup>6</sup>

Evidence of these geopolitics of LNG were painfully uncovered in the final weeks of 2022, as the European Parliament was shaken by a corruption scandal with alleged ties to Qatar. On the 18<sup>th</sup> of December, Qatar made it clear that their LNG comes with strings attached, when it implied that the fallout of the Qatargate investigation could result in supply disruptions.<sup>7</sup> Increased gas imports from Qatar had already raised eyebrows in the run up to the World Cup, as construction workers died and the working conditions were heavily criticised.<sup>8</sup> The FIFA boycott of beer sales and rejection to wear the ONE LOVE captain band, presumably to accommodate the Qatari

host, added fuel to the fire. The allegations of corruption in the European Parliament should be a warning sign for the EU. However, Germany seems eager to repeat its mistake, as Germany's Minister for Economic Affairs, Robert Habeck has stated that the scandal should not be connected to gas purchases, which is reminiscent of Merkel's refusal to link the Nord Stream 2 pipeline and the poisoning of Navalny.<sup>9</sup>

The geopolitics of LNG is not limited to Qatar, as the United Arab Emirates (UAE) have requested the reduction of visa restrictions in exchange for more gas deliveries to the European market. Also, US LNG deliveries might not be as innocent as they appear. The US is a NATO ally, which has promoted its LNG as "freedom gas" under former US President Donald Trump. Similarly, current US President Joe Biden committed 15 bcm of additional US LNG supplies to the EU in March 2022.<sup>10</sup> Yet, the record volumes of US LNG to the European continent had nothing to do with the warm Trans-Atlantic relations or the involvement of the US administration. US LNG was shipped to the EU because of the price premium being paid on the European market. Now and in the future, US LNG goes to the highest bidder and that is not necessarily Europe. Other actions of the US also seems to suggest that the EU is on its own. The Biden Administration retracted its support for the EastMed pipeline project from Israel, Cyprus and Greece, as a liquefaction terminal is constructed quicker, yet more LNG would also help increase the EU's dependency on LNG. The US Inflation Reduction Act, that provides a tax break for US clean energy technology, has the EU worried that its own clean industry will suffer at a critical time. Also, a possible re-election of Trump in 2024 might negatively impact LNG exports, as increased energy prices inside the US might trigger an "America first" discourse in the energy domain. The EU should thus not count on the US to fulfil its energy needs.

### Can LNG help with the energy transition?

Natural gas is the cleanest fossil fuel when it comes to CO<sub>2</sub> emissions and it is therefore promoted as a transition or bridge fuel. Yet, there is more to the story. Methane (CH<sub>4</sub>) emissions often

leak from gas production sites and transmission pipelines. Methane is a far more potent greenhouse gas than CO<sub>2</sub>. In the first 20 years after emission, methane contributes 80 (!) times more to global warming than CO<sub>2</sub>. This means that the short term implications of natural gas for climate change are enormous.

Is LNG better than piped gas? Research suggests that US LNG might be cleaner than Russian piped gas.<sup>11</sup> These studies compare the Russian gas production and gas infrastructure, which is associated with massive methane leakages, to the cleanest production region of the US. However, within the US there are major differences in methane emissions across different production regions. Permian shale gas, for example, has higher emissions than fields in the Appalachian region.<sup>12</sup> So, when making comparisons, a lot depends on how the gas is produced as well as the state of the transmission pipelines. All things equal, the conversion process (gas-liquid-gas) and the shipping of LNG has more emissions than piped natural gas.

However, the story does not stop at emissions. The newly constructed LNG terminals and signed contracts can have some unwanted implications for our climate ambitions. These LNG terminals are diverting billions of euros which could have been spent on zero-emissions technologies or improving energy efficiency. The lifespan of these LNG terminals – at least 30 years - exceeds the EU's ambition to reach net zero by 2050. Germany has rented floating storage and regassification unit (FSRU) LNG terminals for a period of 15 years and is also expected to build onshore LNG. These terminals were a lot more expensive than initially projected (6.5 billion euros instead of 3 billion euros).<sup>13</sup> At the end of November, a 15 year LNG deal was signed ensuring Qatari gas supply to Germany until 2041. Minister Habeck welcomed the deal and “would not mind 20-year or longer contracts”.<sup>14</sup> Producers are also pushing for long-term contracts.<sup>15</sup> This risks locking-in carbon in the mid- and long term and would be a bad development for European and global climate ambitions.

Additionally, EU countries are sending mixed messages to developing countries about natural gas potential. Research has highlighted the need to keep fossil fuels in the ground in order to reach the goals of the Paris Agreement. Over the past years, the EU has been pushing this message. Now, EU governments are saying the opposite and the EU and EU governments have signed 39 new gas deals with traditional and non-traditional gas producers, such as Congo, Israel and Egypt. The investments of these countries should not be taken lightly by the EU, especially if the EU decides 10 years from now that they do not want this gas anymore. The development of these gas fields will have a long lasting impact on developing countries.

### The international impact of Europe's scramble for gas

As if the geopolitical and climate impacts were not bad enough, the scramble for gas by Europe has severe implications for other LNG consumers. Pakistan, Bangladesh, and India have struggled with high LNG prices, as most shipments head to the EU. A Pakistani tender for LNG supplies to be delivered in 2023 has resulted in zero bids. The lack of LNG has resulted in black-outs and a shrinking economy, on top of climate change-induced floods. Bangladesh also experienced the knock-on effect of the European energy crisis, as more than 100 million people were left without power for multiple hours this year.<sup>16</sup> European companies are purchasing LNG at the expense of these countries and therefore energy poverty is increasing. There seems to be no regard for the impact their actions have. Unaffordable energy can have a destabilizing impact on the already fragile region. The EU's hunger for LNG is unsatisfiable, and is called ruthless by some.<sup>17</sup>

In 2022, the EU has been fortunate that Chinese COVID-19 measures have limited LNG demand from China. The additional 40 billion cubic meters of LNG delivered to Europe are almost equal to the drop in LNG to China, but questions can be raised about what the LNG market will look like after China's LNG demand returns.<sup>18</sup> This year the EU might have to compete against China for LNG,

while also mitigating an expected 30 billion cubic meters gas shortage.<sup>19</sup>

### A slippery slope

The EU is replacing Russian gas with LNG, but LNG might prove to be a false saviour. The energy source is not bereft of geopolitics, as is evident from the Qatari threats to withhold LNG and UAE demands for reduced visa requirements. Even US LNG might not be as stable as assumed. Additionally, there are valid climate concerns regarding natural gas, the additional emissions from the liquefaction-regassification process, and the investments in LNG terminals that lock-in carbon. Further, Europe's global scramble for gas is impacting third countries and the redirection to LNG is threatening to expose Europe to increased competition with China.

The EU needs to tread carefully when it comes to LNG, as LNG is proving to be a slippery slope. Europe should strive for more independence and less emissions. This can only be done through increasing energy efficiency, energy demand reduction, and maximizing renewables (other measures of the REPowerEU plan). Russian gas should only be replaced with LNG to fill-in the gaps left by other measures. Large scale investments in LNG put Europe on a path of new dependency, a scenario that Europe should try to avoid at all costs.

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<sup>1</sup> Alice Hancock, "Europe's new dirty energy: the 'unavoidable evil' of wartime fossil fuels," *Financial Times*, 6 September 2022, <https://www.ft.com/content/b209933f-df7f-49ae-8f82-edc32ed622a6>.

<sup>2</sup> Hancock, "Europe's new dirty energy: the 'unavoidable evil' of wartime fossil fuels."

<sup>3</sup> Satish Kumar et al., "LNG: An eco-friendly cryogenic fuel for sustainable development," *Applied Energy* 88 (2011).

<sup>4</sup> Kumar et al., "LNG: An eco-friendly cryogenic fuel for sustainable development."

<sup>5</sup> Jiansong Wu et al., "A quantitative LNG risk assessment model based on integrated Bayesian-Catastrophe-EPE method" *Safety Science* 137 (2021).

<sup>6</sup> "Imports of natural gas by partner country - monthly data," 2022, accessed 16 December

<sup>7</sup> Reuters, "Qatar reiterates denial that its government involved in EU corruption case," *Reuters*, 18 December 2022, <https://www.reuters.com/world/qatar-reiterates-denial-that-its-government-involved-eu-corruption-case-2022-12-18/>.

<sup>8</sup> "Qatar World Cup of Shame," 2022, <https://www.amnesty.org/en/latest/campaigns/2016/03/qatar-world-cup-of-shame/>.

<sup>9</sup> "As corruption scandal unfolds, Germany's Habeck wants to keep Qatar gas," *Politico Pro*, 2022, <https://www.politico.eu/article/robert-habeck-germany-qatar-wants-to-stick-to-qatar-gas-purchases-despite-corruption-scandal/>.

<sup>10</sup> "Biden's Commitment For US LNG To Supply Europe Faces Strong Headwinds," *Forbes*, 2022, <https://www.forbes.com/sites/davidblackmon/2022/03/27/bidens-commitment-for-us-lng-to-supply-europe-faces-strong-headwinds/?sh=4e7f9227247a>.

<sup>11</sup> Leslie S Abrahams et al., "Life cycle greenhouse gas emissions from US liquefied natural gas exports: implications for end uses," *Environmental science & technology* 49, no. 5 (2015); Selina Roman-White et al., *Life cycle greenhouse gas perspective on exporting liquefied natural gas from the United States: 2019 update*, National Energy Technology Laboratory (2019).

<sup>12</sup> Julian Wettengel, *Unravelling the climate footprint of U.S. liquefied natural gas*, *Clean Energy Wire* (2020), <https://www.cleanenergywire.org/news/unravelling-climate-footprint-us-liquefied-natural-gas>.

<sup>13</sup> Nikolaus J. Kurmayer, "Twice as expensive: The high cost of Germany's floating LNG terminals," *Euractiv*, 21 November 2022.

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- <sup>14</sup> Nikolaus J. Kurmayer, "Germany inks first major gas deal with Qatar," *EURACTIV*, 29 November 2022, <https://www.euractiv.com/section/energy/news/germany-inks-first-major-gas-deal-with-qatar/>.
- <sup>15</sup> Marwa Rashad, "Explainer: Should Europe use more long term LNG contracts?," *Reuters*, 7 February 2022, <https://www.reuters.com/business/energy/should-europe-use-more-long-term-lng-contracts-2022-02-07/>.
- <sup>16</sup> "Europe's Liquefied Natural Gas demand surge hits Asia," *DW*, 2022, <https://www.dw.com/en/lng-european-thirst-for-natural-gas-puts-bangladesh-and-pakistan-in-the-dark/a-63401354>.
- <sup>17</sup> Jeroen Van Horenbeek, "'Meedogenloos' is het juiste woord: hoe de Europese jacht op gas het licht uitdoet in ontwikkelingslanden," *De Morgen*, 16 November 2022.
- <sup>18</sup> "Data 31 October 2022," 2022.
- <sup>19</sup> IEA, *How to Avoid Gas Shortages in the European Union in 2023: A practical set of actions to close a potential supply-demand gap* (2022).