

# REKK POLICY BRIEF

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## EU SANCTIONS ON RUSSIAN LNG

### HOW DOES IT AFFECT EUROPE AND RUSSIA?

In response to Russia's unprovoked invasion of Ukraine, the EU rolled out a number of sanctions targeting the Russian economy. Until the 14th sanctions package none included restrictions on Russian pipeline gas or LNG. In June 2024, the 14th sanction package<sup>1</sup> forbade the

- Reloading and transshipment of Russian LNG at European terminals and
- Delivery of Russian LNG to terminals not connected to the interconnected natural gas system.

In detail, Council Decision 2024/1744 defines the transshipment activity as any direct or indirect technical assistance, brokering services, financing or financial assistance related to the reloading of natural gas originating in or exported from Russia (Article 4w).<sup>2</sup>

Additionally, Council Regulation 2024/1745 adds a prohibition on importing LNG to terminals not linked to the European transmission system. This restriction was initiated by Finland and Sweden, having most of small-scale off-grid LNG terminals. In addition to the Finnish and Swedish terminals, Malta Delimara FSRU and the Spanish El Musel terminal are also affected by this ban – however these facilities are not the usual destination of Russian cargoes.

Besides limiting the revenues of Russia, the sanction may have broader effects on global gas markets affecting the LNG and other gas trade flows in Europe. Applying our European Gas Market Model (EGMM) we aim to capture the effects of the sanctions on the European market as well as the sales and revenues of Russia.

A number of experts have already commented on these sanctions. OIES pointed out that the sanctions will not decrease the Russian LNG volumes to Europe and may increase the Russian

LNG sales, and limit the availability of Yamal LNG.<sup>3</sup> Arbeola noted that the sanctions strongly disrupt the logistics chain set up to deliver Yamal LNG cargoes year-around to Asian markets, thus limiting the availability of the terminal without hurting the European market.<sup>4</sup> Timera Energy claimed that an EU ban on transshipments forces the Russian LNG fleet to take longer journeys and tie up the carriers, inhibiting the ability to sustain a full loading programme of the terminal and constrain utilisation.<sup>5</sup> Building on the findings from these brief analyses, our paper aims to model the impact of sanctions and quantify the effects on volumes and trade.

This paper is structured as follows: first, a *without sanctions* case is calibrated to 2023 Q2-Q4/2024 Q1 market conditions. Second, we formulate the constraints of the Council Decisions for the model and identify a number of scenarios of how the sanctions could play out. Third, model results are compared to the *without sanctions* case, focusing on LNG flows to Europe, revenues and sales of Russia and the cost of gas procurement for the EU. Finally, we summarise our main findings from the modelling.

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<sup>1</sup> [COUNCIL REGULATION \(EU\) 2024/1745 of 24 June 2024 amending Regulation \(EU\) No 833/2014 concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine](#)

<sup>2</sup> [Council Decision \(CFSP\) 2024/1744 of 24 June 2024 amending Decision 2014/512/CFSP concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine](#)

<sup>3</sup> [Katia Yafimava, Agnieszka Ason, Jack Sharples, Jonathan Stern \(2024\): EU sanctions on Russian LNG: choices and consequences. Oxford Energy Insight \(156\)](#)

<sup>4</sup> [Ignacio Urbasos Arbeola \(2024\): Banning Russian LNG transshipment in European ports: a pragmatic and effective measure. Expert comment, Elcano Royal Institute](#)

<sup>5</sup> [Timera Energy \(2024\): Russian LNG trade faces growing headwinds. Timera Snapshot.](#)

## SETTING UP THE WITHOUT SANCTIONS CASE

To quantify the effects of the sanctions, a without sanctions case is calibrated to the 2023-2024 market outcomes. The model was fitted to recreate EU27 gas demand, storage use, production and major LNG and pipeline flows, as well as the general price levels observed in organised gas markets. The modelling assumed a global LNG price of 35 EUR/MWh.

## MODELLING THE SANCTIONS

Transshipment activity is not explicitly modelled in EGMM, as all flows relate to physical flows between countries. However, to better grasp the current functioning of the transshipment activity of Yamal LNG, we chose to model this phenomenon by setting the transportation cost for Russian vessels to Japan at the same level as cost of delivering LNG to the European market in our base case.

From a modelling point of view, the effects of the sanctions will be twofold:

- Limiting the capacity of Yamal LNG exports by lengthening the route to Japanese markets and tying up the scarce icebreaker ARC7 carriers. In 2022 and 2023, ARC7 carriers were making rounds between the Yamal LNG terminal and Europe (Zeebrugge or Montoir-de Bretagne terminals), reloading their cargo to other vessels. If the icebreaker ships are not available, other vessels cannot reach the Yamal terminal, limiting its utilisation.
- Making the cost of shipping Russian LNG to Japanese markets more costly due to the longer distance.

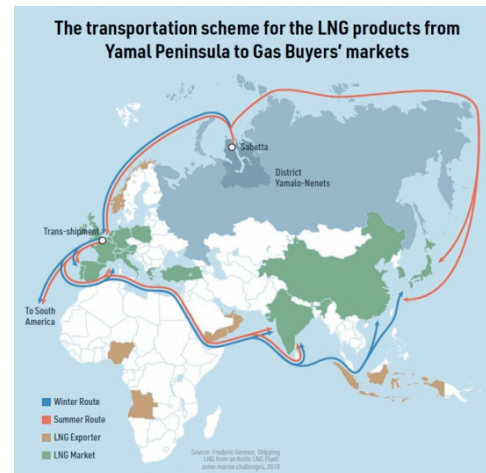
Transshipments of Russian LNG at European terminals accounted for -5.1 bcm in 2023,<sup>6</sup> taking place mainly in Zeebrugge and Montoir de Bretagne. Delivering these cargoes from Yamal to the European terminals takes 7 days one way, 14 days roundtrip (assuming an average vessel speed of 15 knots). LNG is reloaded in the terminals to other vessels which have no icebreaking capabilities, and these transit to Japanese ports via the Suez Canal or passing by the Cape of Good Hope around Africa.

The sanctions forbid transshipment, forcing the ARC7 icebreaker LNG carriers to perform the entire voyage, as no other ports along the route are capable for such transshipment service. Other options include reloading on the open sea or at Murmansk port, but these are dangerous and limited possibilities. Assuming an average speed of 15 knots and a roundtrip of vessels from liquefaction to regasification and back, it would take 40 days by the Cape of Good Hope one way and 31 days via the Suez Canal as opposed to the 14 days roundtrip to Zeebrugge.

This would mean that the liquefaction capacity cannot be operated at full utilisation due to the unavailability of appropriate icebreaker vessels. The 5.1 bcm reloaded in 2023 would shrink to 0.76 bcm/year directly delivered to Japan, if the ships were to make the longer route passing the Cape of Good Hope and 0.94 bcm/year via the Suez Canal. This would result in a 10% capacity limitation for all Russian LNG terminals and a 18%

<sup>6</sup> Ana Maria Jaller-Makarewicz (2024): [EU ban on Russian LNG transshipments is a sensible move from a financial and resource planning perspective](#).

FIGURE 1: TRANSPORT ROUTE FOR YAMAL LNG



Source: [Frederic J.L. Hannon \(2018\): Shipping LNG from an arctic LNG plant: some marine challenges. PIANC-World Congress Panama City, Panama 2018.](#)

constraint for Yamal terminals.

Russian LNG liquefaction capacities are the Yamal LNG, Portovaya LNG, Vysotsk LNG and Sakhalin LNG, totalling 41.4 bcm/yr liquefaction capacity. As of 2024, Yamal LNG was operating with four liquefaction trains, with a total capacity of 17.4 million tons per year (-23.7 bcm/year). Portovaya LNG (1.5 mtpa, -2 bcm/year) and Vysotsk LNG (1.5 mtpa, -2 bcm/year), two smaller liquefaction plants in the Baltic Sea were also delivering cargoes to European terminals. Sakhalin LNG trains (11.5 mtpa, -15.7 bcm/year) located in the far eastern part of Russia delivers cargoes to Asian markets directly. In 2023, total Russian LNG export was 31.5 mtpa (-42.9 bcm/year),<sup>7</sup> of which 54% targeted Asian markets while 46% was reaching European markets, net of transshipments.

To model the effects of the sanctions, we have developed four different scenarios:

- **SC1:** the total capacity of the Yamal LNG terminal related to transshipments is limited due to the longer route and the lower availability of the Russian ARC7 carrier fleet. Due to contractual obligations, the cargo needs to be delivered to the destination markets and the LNG carriers are tied down in a longer route. This means a 10% reduction in total Russian LNG liquefaction capacities and a 18% reduction in the Yamal liquefaction capacities. Moreover, the relative cost of shipping LNG to Japan is increased by -22% to reflect the longer delivery routes.
- **SC2:** an extreme case is tested when Europe chooses not to import Russian LNG at all. This means that Sakhalin II LNG is shipping to Japan only, and consequently the cost of reaching European markets increases greatly for Russian LNG. This scenario is highly unrealistic to occur, but shows the full potential impact of the Yamal terminal being unavailable to global markets.

<sup>7</sup> Total export reported is indeed higher than the nameplate capacity of Russian liquefaction terminals.

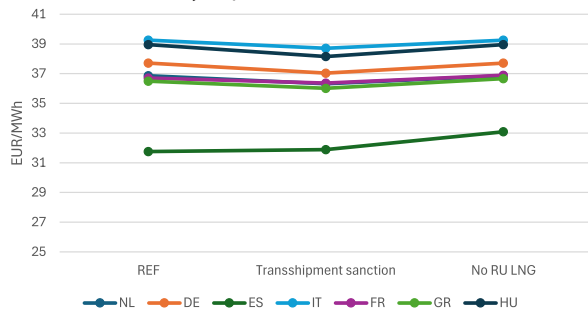
## RESULTS

Scenario results are presented in terms of wholesale prices in Europe, the total gas bill of the EU27, and the profit from Russian LNG sales.

Considering prices, even the main LNG importing and consuming markets are not affected by the sanctions. The price effects of the sanctions are below 1% compared to the *without sanctions* case.

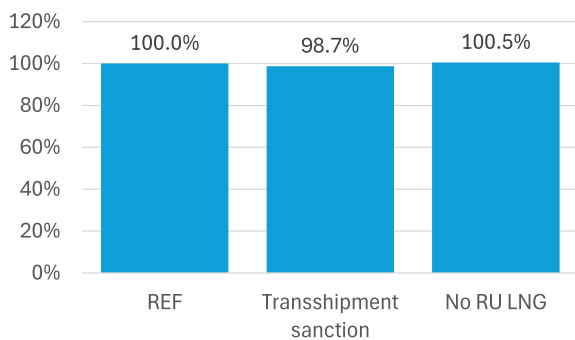
Consequently, the cost of sanctions to European consumers is negligible, as the total gas bill of the EU in the sanctions scenarios differs by less than 2% from the reference case.

**FIGURE 2. MODELLED PRICES IN SELECTED MARKETS DUE TO SANCTIONS ON RU LNG TRANSSHIPMENTS, EUR/MWH**



Russian LNG deliveries and revenues are strongly affected by the sanctions. Our reference case reproduces the 2023 breakdown of LNG exports to European and Asian markets.

**FIGURE 3. TOTAL GAS PROCUREMENT COST OF THE EU27 COMPARED TO THE REFERENCE CASE DUE TO THE SANCTIONS ON LNG, %**



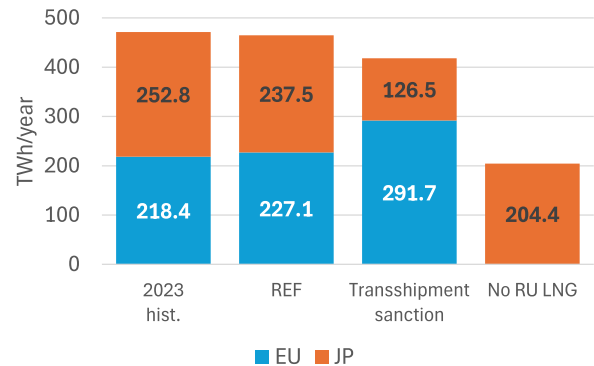
In Scenario 1 (Transshipment sanction), the effect of the sanctions is modelled as lower availability of Yamal LNG and as a more costly option of shipping to Asian markets. This results in a shift of cargoes towards the relatively more attractive European markets, as well as an overall lower utilisation of Yamal LNG: The joint effects result in additional 65 TWh/yr of LNG inflow to Europe (+28% of Russian LNG export to Europe).

In Scenario 2 (No RU LNG), the complete closure of Yamal LNG would mean that all cargoes would target the Asian markets.

Revenues of Russia from LNG sales are also quantified. Revenues are the simple product of modelled wholesale gas pri-

<sup>8</sup> CREA: Payments to Russia for fossil fuels since 24 February 2022.

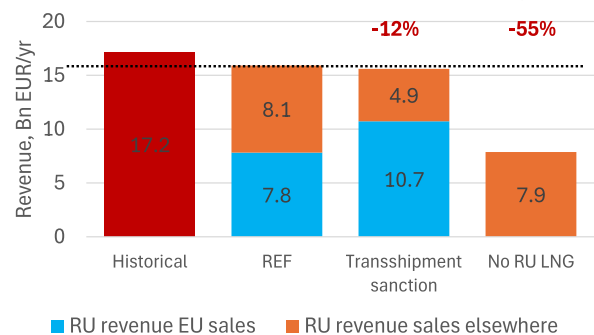
**FIGURE 4. MAIN TARGET MARKETS OF RUSSIAN LNG FLOWS MODELLED DUE TO THE SANCTIONS, TWH/YR**



ces and volumes delivered: price for LNG delivered to Asia is 38.5 EUR/MWh in all scenarios, while price of LNG delivered to European markets is the modelled market clearing price for the specific country. Furthermore, theoretical profits on gas sales are also calculated, assuming a 5 EUR/MWh liquefaction cost and a 3 EUR/MWh gas production cost.

In the without sanctions case, 17.6 Bn EUR annual revenues on

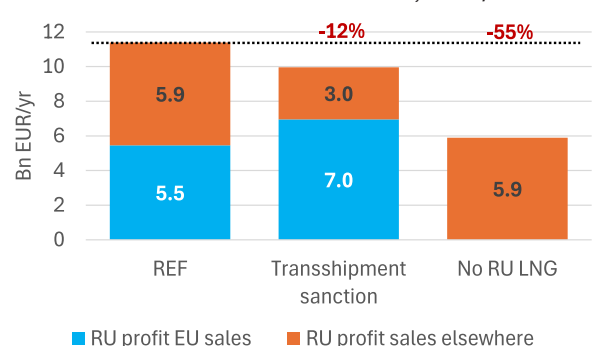
**FIGURE 5. HISTORICAL AND MODELLED REVENUES OF RUSSIAN LNG SALES, Bn EUR/YR**



Russian LNG sales are modelled. As a comparison, CREA reported 17.16 Bn EUR/yr annual revenue in 2023 for total Russian LNG sales, so our assumptions and modelling are close to the historical figures.<sup>8</sup> Modelled revenues are 10% lower in SC1, 2% lower in SC2, 12% lower in and SC3, and 55% lower in SC4 than in the without sanctions case.

Modelled profits follow a similar pattern to revenues. If sanctions make shipping to Asian markets more expensive, European sales would increase as more Russian LNG would reach the European terminals.

**FIGURE 6. MODELLED PROFITS OF RUSSIAN LNG SALES, Bn EUR/YR**



## CONCLUSIONS

The sanctions on the transshipment and reloading of Russian LNG in European ports have no direct effect on the European wholesale prices and the gas bill of the EU27. This means that the sanctions have a negative impact on the European gas market, or to put it bluntly, the sanctions do not hurt European consumers.

However, the sanctions make shipping routes longer for specialised Russian ARC7 icebreaker carriers, and indirectly constrain the capacity of Yamal LNG by 18%. The longer route also increases shipping costs, making Asian markets less attractive and European markets more lucrative for Russian LNG. This could result in additional Russian LNG import volumes to the EU.

Would be Russia to shut down its entire Yamal production as a response to the sanctions, it would hurt European consumers only marginally, having a negligible effect on wholesale prices. At the same time, it would significantly reduce its own LNG sales revenue and profit by more than half.

Overall, the sanctions on transshipment are not costly from the point of view of the EU27, but could reduce the Russian sales revenues by 2-12%. This means the sanctions are well-designed in the sense that they have considerable effect on Russia, but are not costly for Europe.

However, the sanctions have the potential effect of increasing Russian LNG sales to Europe. This means that due to the sanctions, Europe is financing the Russian budget more. It is an intriguing effect and should be considered whether this was the intention of the sanctions or not.

## REKK FOUNDATION

*The goal of the REKK Foundation is to contribute to the formation of sustainable energy systems in Central Europe, both from a business and environmental perspective. Its mission statement is to provide a platform for open-ended, European-wide dialogue between government and business actors, infrastructure operators, energy producers and traders, regulators and consumers, professional journalists and other interested private entities. The Foundation will develop policy briefs and issue papers with forward-looking proposals concerning challenges posed by energy and infrastructure systems and organize regional forums allowing stakeholders to become familiar with the latest technological and regulatory developments within the industry.*



**Péter Kotek** graduated in 2009 at the Corvinus University of Budapest as an economist, majoring in market analysis. He joined REKK in the same year as a research associate. From 2015, he is working as a senior research associate. His areas of interest are ancillary services market in electricity, LNG and gas storage markets. He has

participated actively in REKK's gas market modelling work since 2015.



**Borbála Takácsné Tóth** has worked with REKK since its creation in 2004. In 2001 she received an M.A. in International Relations and European Studies at the CEU in Budapest. Borbála is an economist and received her degree from the Budapest University of Economic Sciences in 1998. Between 2001 and 2003 she was Head of the President's Secretariat responsible for international relations of the Hungarian Energy Office. Her main fields of expertise include:

regional co-operations; security of supply issues; energy geopolitics; major infrastructure initiatives in the gas sector and incentives for investments; competition cases in the gas market; and the effect of gas release programs on competition in the gas market in Europe.



**Adrienn Selei** has been working for REKK since 2011. Her work especially includes gas market modelling, but she has been also involved in different works in the field of electricity markets (mainly analysing system reserves market and topics of market integration). She has already finished her Phd studies in Economics. Due to her studies and

teaching experience she has a profound knowledge in industrial economics and market modelling.