

REKK POLICY BRIEF

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RUSSIA'S ENERGY WEAPON

EXAMINING HOW A REDUCTION OF GAS EXPORTS CAN IMPACT EUROPEAN PRICES

The 24 February 2022 Russian invasion of Ukraine marks a new epoch in modern history. The first days of the war moved many Western countries to impose economic sanctions on Russia despite the leverage it has over Europe with energy supplies, especially natural gas which still dominates the residential heating mix.

- In the short-run, a complete cessation of Russian natural gas would force Europe to curtail 900 TWh or 17% of current demand
- Wholesale price would increase some 200-300% overall but price zones would re-emerge based on ability to access to LNG and global markets
- LNG terminals are limited by internal bottlenecks (e.g. UK, Iberian Peninsula)
- Total cost of gas procurement may increase by 100 Bn EUR (over 40% increase)

BACKGROUND

The 24 February 2022 Russian invasion of Ukraine marks a new epoch in modern history. The first days of the war moved many Western countries to impose economic sanctions on Russia despite the leverage it has over Europe with energy supplies, especially natural gas which still dominates the residential heating mix. With a warmer early spring arriving, the remaining heating requirements for this heating season appear manageable. However, refilling storage facilities for the next winter season is going to be a challenge. Bruegel warns that alternative natural gas sources cannot substitute for the loss of Russian gas and recommends the EU accelerates energy efficiency.¹

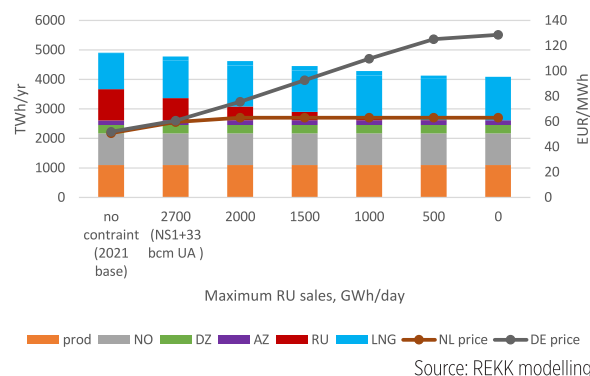
Based on the current sanctions and European Parliament's proposed Resolution to ban Russian oil and gas imports, a significant reduction of Russian energy supplies seems more and more likely. In 2021 Russia provided 40% of EU27 imports. In our modelling scenarios, we proportionally decreased Russian gas supplies to Europe on all possible routes.² Our results cover a wider region, including EU27, UK and contracting parties of the Energy Community.³

MODELLING

The modelling considers scenarios where Russian gas import are capped, beginning with the maximum constraint of 2700 GWh/day, effectively a utilising only Nord Stream 1 and ~33 bcm through Ukraine, compared with 2000, 1500, 1000, 500 and 0 GWh/day.

Figure 1 shows that the lower Russian deliveries are partially compensated by LNG and the Azerbaijan pipeline but still European demand should fall by 17%. The other very interesting phenomenon is that the EU wholesale gas price index TTF on a yearly average does not skyrocket from the starting level (here 60€/MWh) despite the scarcity of Russian supplies. However, volatility of prices may still result in price spikes exceeding the yearly average price. Eastern

FIGURE 1. IMPACT OF RUSSIAN GAS VOLUMES TO EU27, UK AND ENC CONTRACTING PARTIES ON EUROPEAN WHOLESALE PRICES



European countries would face the highest prices due to the internal bottlenecks in the European system that prevent LNG from moving west to east and reaching these markets.

The pricing maps illustrate the West-East price discrepancy, with UK, FR, Iberian Peninsula and the Benelux paying much lower prices than CEE owing to LNG availability. Lithuania also benefits from LNG while its immediate neighbours are the least connected to markets and face the highest prices. Prices in the Balkans are closer to Western Europe than CEE, owing to low demand, LNG from the south, and Azeri supplies via the Trans Adriatic Pipeline (TAP). Since the Trans-Balkan pipeline does not use reverse flow, Ukraine and Moldova cannot benefit from lower southern prices.

FIGURE 2. CHANGE IN ANNUAL EUROPEAN WHOLESALE NATURAL GAS PRICE WITHOUT RUSSIAN IMPORTS, €/MWH

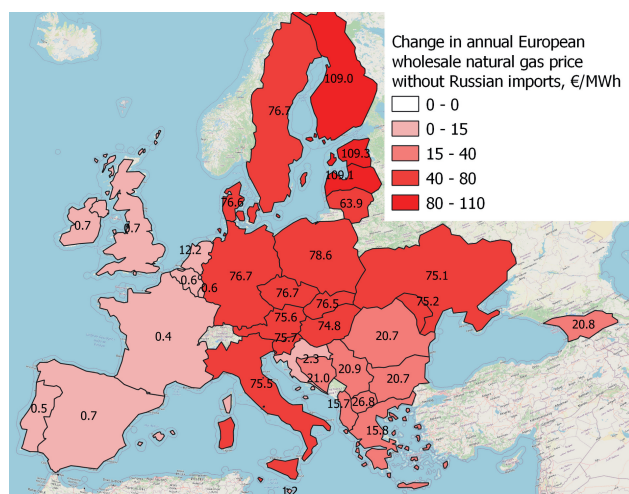
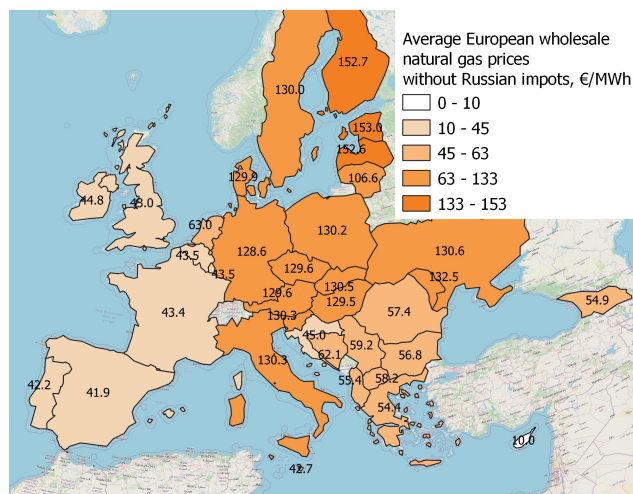


FIGURE 3. AVERAGE EUROPEAN WHOLESALE NATURAL GAS PRICES WITHOUT RUSSIAN IMPORTS, €/MWH

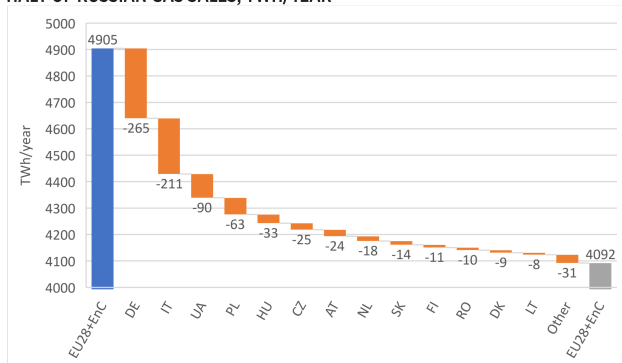


1 Bruegel: Can Europe survive painlessly without Russian gas? A number of analysis were published in the past weeks on this issue: [IEA](#), [Bruegel](#), [Aurora Energy](#), [OIES](#), [Timera Energy](#), [Rystad Energy](#).

2 Nord Stream 1, Yamal, Blue Stream, TurkStream 1-2 and Brotherhood

3 Albania, Bosnia and Herzegovina, Georgia, Kosovo*, Moldova, Montenegro, North Macedonia, Serbia, Ukraine (*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.)

FIGURE 4. CHANGE IN YEARLY NATURAL GAS CONSUMPTION DUE TO COMPLETE HALT OF RUSSIAN GAS SALES, TWH/YEAR



Source: REKK modelling

Most of the 900 TWh/year⁴ demand reduction occurs in Germany and Eastern European countries while the aforementioned countries with access to LNG markets maintain similar consumption levels.

CONCLUSIONS

A full cessation of Russian gas imports to Europe would force 900 TWh or ~17% curtailment and cause a price spike. For the EU27, UK and the EnC contracting parties the cost of gas procurement would increase by over 100 billion EUR/year or 40% compared to the baseline. Full capacity of LNG regasification terminals may not be utilised, as internal bottlenecks within the EU hamper the further transmission of gas (e.g. from UK to the Continent and from the Iberian Peninsula to France). Europe would be divided into four price zones from lowest to highest:

- (i) Western and Southern European;
- (ii) Balkans up to Serbia and Bulgaria,
- (iii) CEE from Germany to Ukraine;
- (iv) Baltic countries.

⁴ Demand elasticity was assumed to be 0.15.

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.



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 Central European University in Budapest. Borbála was educated as an economist and received her degree from the Budapest University of Economic Sciences in 1998. She

spent 5 years as a civil servant in government administration mostly in the field of energy regulation. Between 2001 and 2003 she was Head of the President's Secretariat responsible for international relations of the Hungarian Energy Office. In this capacity she worked closely with ERRA and CEER. With REKK she has been leading several international and national consultancy projects, with many using the European Gas Market Model as the primary analytic tool. 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.



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.



Adrienn Sele 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 (at Corvinus University of Budapest). Due to her studies and teaching experience she has a profound knowledge in industrial economics and market modelling.