

The Impact of Russia's Invasion of Ukraine on Global LNG Balances in 2030: A Scenario from the bp Energy Outlook 2023

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Abstract

This paper illustrates a scenario of how Russia's invasion of Ukraine could influence global LNG balances in the medium term to 2030. The reaction to the war reduces Russia's pipeline and LNG exports. However, the overall size of LNG trade in 2030 is broadly unchanged. On demand, higher EU LNG imports offset lower LNG imports into Asia. The US and Middle East share of LNG growth increase to offset the lower Russian LNG exports.

1. Introduction

The Russian invasion of Ukraine in February, 2022 has upended global gas markets and has had major implications for energy affordability globally. In 2021, EU imports of pipeline gas from Russia made up about a third of its demand and this declined by more than 50% in 2022. Due to its fungibility, LNG has been the main source of supply that has helped to balance the EU gas deficit. The magnitude of the loss of Russian pipeline volumes in 2022 was almost 15% of the global LNG market and a third of the spot LNG market, resulting in a drastic tightening of global LNG balances and more than doubling of global natural gas prices. These dramatic changes raise the question of how long global LNG markets may remain disrupted and what the medium-term impact might be on natural gas markets. In this paper, we use a scenario from bp's Energy Outlook 2023 (EO23) to inform this question.

bp's EO23¹, released in January 2023, updates bp's Energy Outlook 2022 (EO22) to take account of changes to the evolution of the global energy system out to 2050 because of Russia's war and the passing of the Inflation Reduction Act in the USA. As in EO22, the EO23 focuses on three main scenarios - Accelerated, Net Zero and New Momentum - to capture a wide range of uncertainty underlying this evolution. Accelerated and Net Zero explore how different elements of the energy system might change to obtain a substantial reduction in carbon emissions consistent with keeping global temperature rises to well below 2° C and 1.5° C respectively, while New Momentum is designed to capture the broad trajectory along which the energy system is currently progressing. These scenarios vary substantially in terms of the outlook for demand for natural gas and fossil fuels more generally, with different implications for how long markets could remain disrupted because of the war. Below, we summarize the most relevant outcomes from the New Momentum scenario (NMS) in EO23 and how it differs from the outcomes in the same scenario in EO22 due to the Russian war.

The main impacts of the war on global LNG markets out to 2030 in EO23 NMS (relative to EO22 NMS) would be:

- An increased focus on energy security resulting in a preference for domestic sources of energy. In addition, there is also a move away from globalization which negatively impacts economic growth and consequently, energy demand growth.
- Russian gas exports remain disrupted due to the EU's determination to increase energy security by phasing out dependence on Russian pipeline imports, and the introduction of EU and US (see below) sanctions on exports of LNG liquefaction technology to Russia, substantially denting Russia's ambition to become a major LNG exporter.
- This reduction in Russian pipeline imports into the EU results in higher EU LNG imports. However, concerns over energy security and lower economic growth result in lower LNG demand growth in Asia, offsetting growth in the EU. Thus, the overall size of LNG market in EO23 in 2030 is similar to our outlook in EO22, c. 770 bcm, a c.50% increase from 2021.
- Loss of Russian LNG exports is made up for by higher exports from the US and Middle East. Together, these two regions account for 70% of the supply growth to 2030. Many projects have already begun construction in both these regions and there remains a substantial pipeline of projects, especially in the US, that will add to this total.

2. The outlook for LNG Demand

The EU is the epicenter of the current disruptions to energy flows emanating from Russia's invasion of Ukraine. This is particularly true for natural gas. In 2021 the EU imported via pipeline c. 132 bcm - around one third of its gas demand - from Russia². In 2022, these pipeline imports from Russia declined to c. 63 bcm³, requiring a combination of demand reduction and increased alternative supply mainly in the form of higher LNG imports.

In EO22 NMS, EU reliance on Russian pipeline imports out to 2030 was similar to levels in 2021. Thus EU LNG imports grew only modestly. In contrast, almost all of the growth in global LNG demand was in Asia. This growth was driven by coal to gas switching in China, continued industrial growth and limited pipeline supply alternatives outside of China. The overall size of LNG trade grew by more than 50% to 790 bcm in 2030.

In EO23 NMS, due to the Russian invasion of Ukraine, Russian pipeline imports into the EU are largely phased out by 2030. To make up for the shortfall, natural gas

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demand declines by 20% between 2021 and 2030, driven by an increase in the share of renewables in the power sector and an increase in the electrification of heating in the residential, commercial and light industrial sectors. Despite this decline in demand, LNG imports increase by c. 50% relative to 2021 highlighting limited alternative pipeline supply options given the decline in domestic production in Europe.

By contrast, Asian LNG demand growth slows in EO23 NMS compared to EO22 NMS. The Russian invasion triggers a move towards deglobalization, reducing economic growth especially in Asia which has benefited substantially from globalization. The weaker macroeconomic outlook reduces energy demand and, in particular, gas demand. In addition, the energy security concerns engendered by the war also result in a preference for lower energy imports in favor of domestic resources. For example, both South Korea and Japan increase reliance on nuclear power generation compared to EO22, negatively impacting gas demand. Finally, the loss of the EU as an export market makes China the largest market for Russian pipeline gas by 2030. Given the lack of many alternative export markets, Russian pipeline exports to China increase relative to EO22 NMS, reducing the need for China to import LNG. The decline in Asian LNG demand growth offsets the growth from Europe, resulting in the overall size of LNG trade growing to 770bcm by 2030, similar to EO22 NMS.

3. Outlook for LNG Supply

In EO22 NMS, the US, Middle East and Russia contributed to almost 75% of the growth in LNG supply between 2021 and 2030. Russian LNG exports more than doubled to almost 110 bcm by 2030 and included continued exports from existing projects such as Yamal LNG and Sakhalin-2 LNG, new supply from projects under construction such as Arctic LNG-2 (which took Final Investment Decision [FID] in 2019) and other projects that were still under development. The scale of the increase in Russian exports was supported by the existence of abundant upstream resources, as well as the ambition of both Gazprom and Novatek to increase their share of exports in the global LNG market.

However, Russian LNG has so far continued to be dependent on support from western partners for technology and finance. Since the invasion of Ukraine, the US and EU have imposed sanctions on the export of LNG and other technology to Russia. These sanctions have been imposed on all potential projects including those already under construction and those still under development. In EO23 NMS, Russia is unable to overcome the sanctions in time and LNG exports increase more modestly, to 50 bcm by 2030. The shortfall in supply is made up for mainly by higher exports from the US and Middle East.

US LNG exports more than double relative to levels in 2021, to 200 bcm by 2030, and make up the greatest share of the loss of Russian LNG exports. Progress towards reaching this level of growth is well underway. Several LNG liquefaction facilities are already under construction in the US as of early 2023, including two major projects which reached FID in 2022 (the first phase of Plaquemines LNG and Corpus Christi LNG Stage 3). Moreover, there are several other projects at various stages of development aiming to make positive FID in the near future.

The Middle East is the second largest source of additional non-Russian LNG supply by 2030 in EO23 NMS compared to EO22. LNG exports from the Middle East grow by around 75 bcm between 2021 and 2030. Of this growth, nearly 45 Bcm is already under construction at Qatar's North Field East expansion project. Among other Middle Eastern new LNG export projects aiming towards FID in the short term are Qatar's North Field South expansion project (22 Bcm) and the UAE's Fujairah LNG (13 Bcm).

4. Conclusion

This paper looks at how the current disruptions to global gas markets may evolve out to 2030, based on one scenario alone. There is clearly substantial uncertainty to the view expressed above not least related to the length of the conflict and any resolution thereof. At this time, the EU remains quite determined to permanently reduce its reliance on Russian pipeline imports and it is certainly difficult to envisage pipeline imports getting back to 2021 levels in the medium term. However, the prospects for Russian LNG exports are more uncertain. Countries in the EU and elsewhere continue to import Russian LNG and there is currently no talk of that changing. Russia's ability to continue to develop projects and export more LNG is therefore dependent on its ability to develop technology either on its own or with non-western help. In a situation where Russian teams were able to make technological advancements we would likely see an increase in global LNG supply and a boost to LNG demand sooner than expected. However, Russia remains reliant on foreign spare parts to service its current LNG liquefaction facilities and sanctions on these could keep Russia out of LNG for longer.

Footnotes

¹ Please see [Energy Outlook | Energy economics | Home \(bp.com\)](#) for a more comprehensive description of the scenarios.

² bp Statistical Review 2022

³ Based on various European Transmission System Operator data.

⁴ References to 2021 volumes in charts are data from bp Statistical Review 2022.

Appendix – Charts⁴

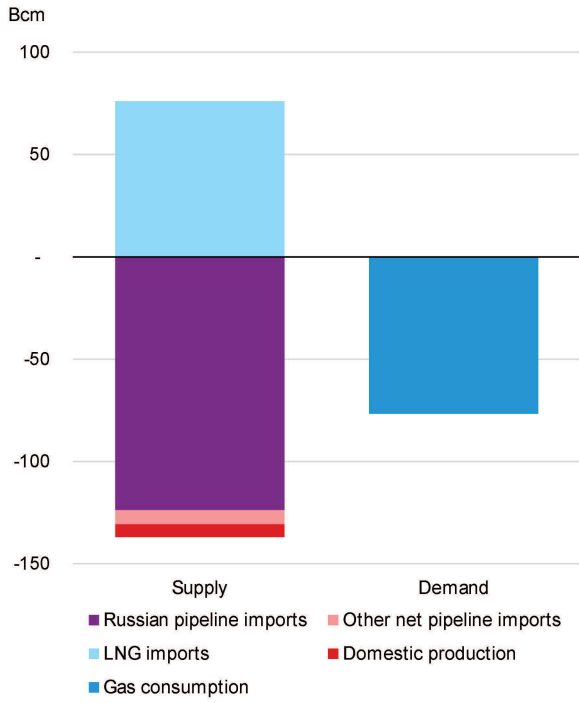


Figure 1: Change in EU natural gas balance 2021-30 in bp's EO23 NMS

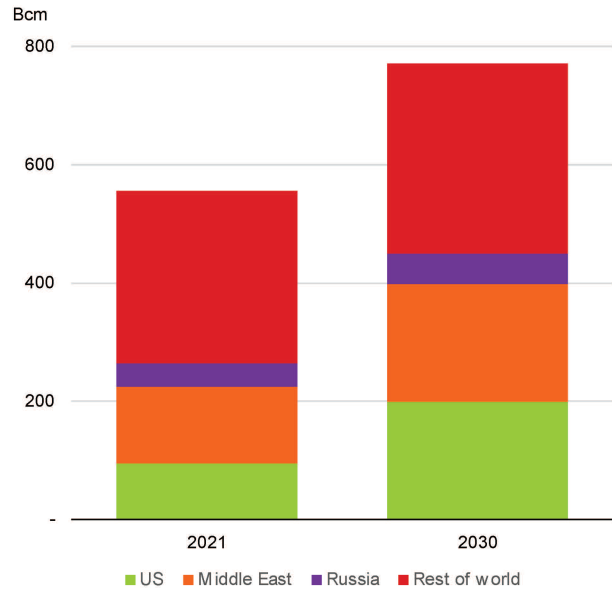


Figure 3: LNG supply in bp's EO23 NMS

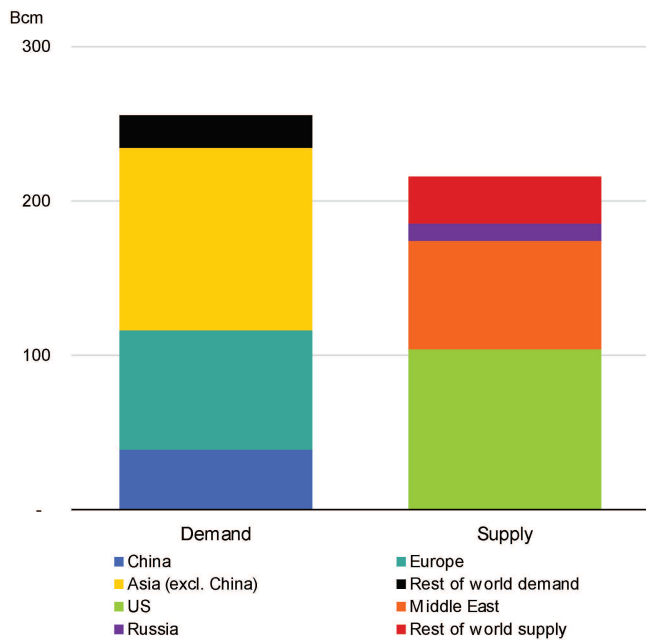


Figure 2: Change in global LNG demand and supply, 2021-2030 in bp's EO23 NMS