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THE OUTLOOK FOR RUSSIA'S NATURAL GAS SECTOR

Russia's Global Energy Role—Working Paper No. 5

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EXECUTIVE SUMMARY

Though Western governments have not imposed sanctions on Russian natural gas deliveries after the February 2022 invasion of Ukraine, Moscow did dramatically reduce pipeline gas supplies to its most lucrative market. Gas exports to Europe, which had been steadily increasing over the past 60 years and were a matter of special pride for the Russian gas industry, had fallen by more than 80% by the end of 2022. Russia's unilateral export cuts have not only led to a dramatic reduction in Russian revenues, but also seriously damaged the country's reputation as a reliable gas supplier as well as its long-term positioning in the global gas market.

Russian officials and company leaders are searching for new customers for Russia's newly stranded natural gas production capacity. Some might be domestic—in power, heat, industry, and transportation—and others might be foreign, especially in Central Asia, China, Southeast Asia, and other emerging markets. Pursuing any of these options will require overcoming a variety of technological and financial obstacles. Dramatically expanding Russia's liquified natural gas (LNG) exports to reach more distant markets will be especially demanding. Whether Russia succeeds or fails, its actions will shape global natural gas markets, wider global energy markets, and—through impacts on greenhouse gas emissions—the global climate.

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War, dependency, leverage, and sanctions

Russia's February 2022 invasion of Ukraine arguably had more severe consequences for its natural gas industry than for any other component of the Russian energy sector. Since the invasion, escalating geopolitical confrontation appears to have destroyed the six-decade gas relationship between Russia and Europe. This has occurred despite the considerable mutual benefits of this relationship over this time.

Russia was the largest gas exporter in the world for several decades, peaking at 260 bcm (billion cubic meters) net gas exports in 2019. In recent years, roughly three-quarters of Russia's gas exports went to Europe; imports from Russia met more than one-third of European gas demand. Russia's invasion of Ukraine and the subsequent near termination of Russian pipeline gas supplies to Europe have significantly affected the country's gas industry and raise important questions about its future size and global role.

Unlike Russia's oil and coal industries, its gas industry did not become an immediate target of Western economic sanctions after the invasion of Ukraine. The significance of Russia's gas supplies to Europe discouraged sanctions on either Russia's pipeline gas exports or its LNG exports to Europe. Only the United States, United Kingdom, and Australia—none of which had ever imported significant LNG volumes from Russia—decided to ban Russian LNG imports.

Most gas-importing countries in the Organisation for Economic Co-operation and Development (OECD)—including European Union (EU) members, Japan, and South Korea—applied only limited pressure to Russia through export controls on technologies and services for existing and new gas operations. These sanctions were rather mild in comparison with the efforts to punish Russia's oil industry.

Russia's pipelines to Europe

The EU's deep dependence on Russian gas—which comprised 40% of its total natural gas consumption—heavily shaped Western thinking and action. Indeed, the OECD's energy organization, the International Energy Agency, released "A 10-Point Plan to Reduce the European Union's Reliance on Russian Natural Gas" less than two weeks after the invasion.[1] The report asserted that following its recommendations could reduce gas imports from Russia by over one-third within one year. Days later, the EU's European Commission announced its own plan, REPowerEU, which outlined steps to reduce gas imports for Russia by approximately two-thirds.[2] In May, the European Commission approved REPowerEU, which called for

1 International Energy Agency, "A 10-Point Plan to Reduce the European Union's Reliance on Russian Natural Gas," March 3, 2022, https://iea.blob.core.windows.net/assets/1af70a5f-9059-47b4-a2dd-1b479918f3cb/A10-PointPlantoReducetheEuropeanUnionsRelianceonRussianNaturalGas.pdf.

2 European Commission, "REPowerEU: Joint European Action for More Affordable, Secure and Sustainable Energy," COM(2022) 108 final, March 8, 2022, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2022:108:FIN.

rapidly "phasing out" fossil fuel imports from Russia.[3] Nevertheless, in spring 2022, immediately following the invasion, Russian pipeline gas flows to Europe increased, as governments and firms sought to fill storage in anticipation of potential reductions in supply. The increased flows did not last, however. Moscow soon sought to exercise its gas leverage to deter EU sanctions and support for Ukraine as well as actions by individual European governments. In late March 2022, a decree by Russian president Vladimir Putin required natural gas importers to pay in rubles or forgo deliveries.[4] The move followed actions in late February by the US, EU, and Japanese governments to freeze Russian Central Bank assets in their banking systems,[5] a step that contributed to a steep decline in the ruble's value.

Before the war, Russia's pipeline network supplied natural gas to Europe along six main routes: via Finland (Vyborg-Imatra), the Baltic states, Poland (Yamal-Europe), Germany (Nord Stream), Turkey (TurkStream and Blue Stream), and Ukraine (Brotherhood, Soyuz, Urengoy-Pomary-Uzhgorod, and Progress). Russia moved swiftly to shut down the first three. In late April, Russia's government began to cut off gas supplies to countries that refused to comply with its ruble-payment rules. Moscow first acted against Poland and Bulgaria,[6] likely in order to demonstrate its resolve to larger customers, such as Germany. Russia next halted supplies to Finland, Denmark, and the Netherlands, and to Shell, for deliveries to Germany.[7]

By summer 2022, only three of the six prewar routes were still working: Nord Stream (with regular reductions of flows that Russia attributed to sanctions on compression station turbines[8]), TurkStream, and pipelines through Ukraine. Despite Russia's constant attacks on the Ukrainian energy infrastructure, gas transit through Ukraine has continued throughout the war, though at reduced rates, possibly in part because the pipelines transport gas to Hungary and Slovakia, which resisted some EU sanctions.[9]

3 European Commission, "REPowerEU Plan," SWD(2022) 230 final, May 18, 2022, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN&qid=1653033742483.

4 Joseph Nasr and Mark Trevelyan, "Putin Tells Europe: Pay in Rubles or We'll Cut off Your Gas," *Reuters*, March 31, 2022, https://www.reuters.com/business/energy/russia-sets-deadline-rouble-gas-payments-europe-calls-it-blackmail-2022-03-31/.

5 "Japan Freezes Assets of Russia's Central Bank as Part of New Sanctions," *Reuters*, February 28, 2022, https://www.reuters.com/world/europe/japan-freezes-assets-russias-central-bank-part-new-sanctions-2022-03-01/.

6 Tsvetelia Tsolova and Anna Koper, "Europe Decries 'Blackmail' as Russia Cuts Gas to Poland, Bulgaria," *Reuters*, April 27, 2022, https://www.reuters.com/business/energy/gazprom-says-it-halts-gas-supplies-poland-bulgaria-payments-row-2022-04-27/.

7 "Russia Widens Europe Gas Cuts and Halts Dutch, Danish, and German Contracts," *Reuters*, May 31, 2022, https://www.reuters.com/business/energy/russia-widens-europe-gas-cuts-gazprom-halts-dutch-traders-supply-2022-05-31/.

8 Some analysts consider the situation more complex than this; see Mike Fulwood et al., "The Curious Incident of the Nord Stream Gas Turbine," Oxford Institute for Energy Studies, July 2022, https://www.oxfordenergy.org/wpcms/wp-content/uploads/2022/07/The-Curious-Incident-of-the-Nord-Stream-Gas-Turbine.pdf.

9 Karel Janicek, Justin Spike, and Derek Gatopoulos, "Slovakia, Hungary Won't Back EU Sanctions on Russian Energy," AP, May 3, 2022, https://apnews.com/article/russia-ukraine-business-bulgaria-serbia-european-union-efa1e4c2f663651f21aaeb2d68f21090f.

Russia finally ended gas flows through the Nord Stream 1 pipeline in August 2022, after reducing deliveries in June and July. Moscow cited technical issues in shutting down the pipeline, which originally transported about one-third of Europe's imports from Russia.[10] On September 26, underwater explosions ruptured the Nord Stream 1 and Nord Stream 2 pipelines;[11] damage to three out of four of the Nord Stream lines destroyed the most significant of the remaining routes and led to further dramatic reductions in Russian pipeline gas exports to Europe.

Between 2021 and 2022, Russia's total annual natural gas exports decreased from 241 bcm, of which 167 bcm went to Europe,[12] to 165 bcm.[13] Nevertheless, because European consumers were keen to obtain as much gas as possible before winter 2022–2023, Russia's overall deliveries (pipeline and LNG) remained high during the first half of the year; cumulative 2022 natural gas exports to Europe reached 104 bcm.[14] While exports were well below historical levels, Gazprom and Russia earned record revenues due to soaring natural gas prices. In 2022, Russian gas industry revenues increased 63%, from $101 billion to $165 billion.[15] Thus despite a 30% loss in total export volumes in 2022, very high gas prices made that year an extremely profitable one for Russian gas companies. The increased revenues attenuated and even obscured the initial shock from the collapse of pipeline exports.

But 2023 has looked less comfortable for Russia's gas companies. Gas is flowing from Russia to Europe only through Turkey and Ukraine, with the latter route vulnerable not only to military action and legal disputes, but also to the expiration of the Russia-Ukraine gas transit agreement in 2024. Even if some gas deliveries continue beyond the end of 2024, it seems unlikely at this stage that the parties will extend the current transit agreement: direct negotiations

10 "Nord Stream 1: How Russia Is Cutting Gas Supplies to Europe," *BBC*, September 29, 2022, https://www.bbc.com/news/world-europe-60131520.

11 The explosions prompted widespread speculation regarding the responsible party. Untangling this controversy is beyond the scope of this paper.

12 BP, "bp Statistical Review of World Energy," 71st ed., 2022, 34, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf.

13 Energy Institute, "Statistical Review of World Energy," 72nd ed., 2023, 35, https://www.energyinst.org/statistical-review.

14 Author's calculation, based on reported 100.1 bcm total pipeline exports to EU, Turkey, and China, minus 15.5 bcm pipeline exports to China, plus 19.4 bcm LNG exports to Europe. See «'Газпром' учится жить без Европы,» *Коммерсантъ*, December 28, 2022, https://www.kommersant.ru/doc/5755139; and Алекс Будрис, «Экспорт российского СПГ в Европу растет: сможет ли ЕС это остановить,» Forbes, July 12, 2023, https://www.forbes.ru/biznes/492632-eksport-rossijskogo-spg-v-evropu-rastet-smozet-li-es-eto-ostanovit.

15 Дарья Савенкова, «Газовая отрасль России может потерять по итогам 2023 года половину выручки,» *Ведомости*, August 7, 2023, https://www.vedomosti.ru/business/articles/2023/08/07/988772-gazovaya-otrasl-rossii-mozhet-poteryat-polovinu-viruchki.

between Ukraine and Russia appear highly implausible in the current environment.[16]

Russia is still exporting about 22 bcm/year to EU countries by pipeline through Ukraine and TurkStream, of which 12–13 bcm/year—more than half—goes through Ukraine.[17] Nevertheless, the trust that long undergirded that relationship has been broken, and the prospects that volumes will ever return to prewar levels seem dim. Regardless of these longer-term possibilities, the EU's major economies, if not all its economies, seem set to forgo additional pipeline gas volumes so long as Russia's war in Ukraine continues.

Russia's pipeline exports to China

In 2022, Russia managed to increase pipeline gas export volumes to China via the Power of Siberia pipeline to 15.5 bcm, and it plans to exceed 22 bcm in 2023.[18] Still, this is a small fraction, perhaps 10% or less, of lost European export volumes and far from sufficient to compensate for lost revenue. The former McKinsey & Company office in Russia, now Yakov and Partners following McKinsey's exit from the country, estimates that total gas industry revenue in 2023 could fall to $71 billion, about three-quarters of the prewar level and less than half of 2022's windfall earnings.[19]

Russia's LNG exports

Russia has also partly compensated for the sharp decline in pipeline gas exports to Europe with steady growth in LNG deliveries to EU countries. Russia was the world's fourth largest LNG exporter in 2021, shipping almost 40 bcm; only Australia, Qatar, and the United States exported more—about 108 bcm, 107 bcm, and 95 bcm, respectively.[20] In 2022, Russia's LNG production and exports reached an all-time high; the country increased its total LNG exports by 8.6% to around 45 bcm, of which more than half went to Europe, up about 20% from 2021 volumes.[21] Although in early 2023 the

16 Anne-Sophie Corbeau and Tatiana Mitrova, "Will the Ukrainian Gas Transit Contract Continue Beyond 2024?" Center on Global Energy Policy at Columbia University–School of International and Public Affairs, June 8, 2023, https://www.energypolicy.columbia.edu/will-the-ukrainian-gas-transit-contract-continue-beyond-2024/.

17 Ibid.

18 «Объем экспорта газа в Китай по ‹Силе Сибири› вырастет, подсчитали эксперты,» *Прайм*, August 21, 2023, https://1prime.ru/gas/20230821/841531559.html.

19 Дарья Савенкова, «Газовая отрасль России может потерять по итогам 2023 года половину выручки,» *Ведомости*, August 7, 2023, https://www.vedomosti.ru/business/articles/2023/08/07/988772-gazovaya-otrasl-rossii-mozhet-poteryat-polovinu-viruchki.

20 BP, "bp Statistical Review of World Energy," 71st ed., 2022, 36, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf.

21 "Russia Boosts LNG Exports to Europe by 20% in 2022–Refinitiv," *Reuters*, January 31, 2023, https://www.reuters.com/markets/commodities/russia-boosts-lng-exports-europe-by-20-2022-refinitiv-2023-01-31/#:~:text=Russia%20increased%20its%20total%20LNG%20exports%20in%202022%20by%208.6%25%20to%20around%2033%20million%20tonnes%20(around%2045%20billion%20cubic%20metres)%2C%20of%20which%20more%20than%20half%20was%20shipped%20to%20Europe.

first signs of a decline became visible,[22] the outlook for 2023 LNG export volumes remains nearly unchanged,[23] despite the calls to ban Russian LNG supplies to the EU. Russia's LNG exports have not thus far suffered from any Western restrictions, though developing new liquefaction projects is becoming much more challenging with sanctions blocking the provision of key technologies to Russia.

Russia's domestic gas market

Domestic demand has also fallen short in compensating for the collapse in pipeline gas exports to Europe. Domestic gas consumption in 2022 increased by 3%, or 14 bcm,[24] but this growth was far from sufficient to absorb the gas bubble that suddenly appeared with the reduction of the European gas supplies. The result has been a significant oversupply of gas inside Russia.

The extreme oversupply in 2022 required immediate reductions in production on a scale that only Gazprom could manage, due to the characteristics of its assets and customer base. Russian gas output that year fell by 11% compared to 2021, with Gazprom absorbing the main part of this reduction and cutting its own output by 20%.[25] Suddenly Gazprom held very significant excess gas production capacity, estimated at about 115 bcm/year in 2022.[26]

While Gazprom reduced its gas production disproportionately, Russian oil companies and independent gas producers launched long-delayed projects, and some even increased their gas production.[27] Adding insult to injury, the Russian government imposed a one-time tax on Gazprom to extract a significant portion of the company's supernormal profits from unusually high gas prices.[28] As a totality, these measures aggravated existing

22 Молекулы Добра, Telegram post, April 27, 2023, https://t.me/molecooly/3779; reporting attributed to Interfax.

23 Дарья Савенкова, «Газовая отрасль России может потерять по итогам 2023 года половину выручки,» *Ведомости*, August 7, 2023, https://www.vedomosti.ru/business/articles/2023/08/07/988772-gazovaya-otrasl-rossii-mozhet-poteryat-polovinu-viruchki.

24 «Россия в 2022 году увеличила потребление газа на 3%, экспорт СПГ на 8%,» *Интерфакс*, January 16, 2023, https://www.interfax.ru/business/880885.

25 Василий Милькин, «Добыча газа в России в Январе упала на 11%,» *Ведомости*, https://www.vedomosti.ru/business/articles/2023/02/28/964511-dobicha-gaza-v-yanvare-upala.

26 While this is one of the highest levels in the last decade, it is less than the approximately 150 bcm in spare capacity that Gazprom had in 2015–2016. Vitaly Yermakov, "'Catch 2022' for Russian Gas: Plenty of Capacity amid Disappearing Market," Oxford Institute for Energy Studies, January 2023, https://www.oxfordenergy.org/publications/catch-2022-for-russian-gas-plenty-of-capacity-amid-disappearing-market/.

27 Василий Милькин, «Добыча газа независимых производителей в России за девять месяцев выросла на 4%,» *Ведомости*, October 10, 2022, https://www.vedomosti.ru/business/articles/2022/10/10/944816-dobicha-gaza-nezavisimih-proizvoditelei.

28 «'Газпром' за три года заплатит дополнительные 1,8 триллиона налогов,» *Прайм*, September 28, 2022, https://1prime.ru/nalogy/20220928/838286007.html.

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rivalries and tensions among Gazprom and other gas producers in Russia's domestic market. These disputes are likely to yield higher rather than lower domestic gas prices.

With the sharp decline in exports, the domestic market faced colossal supply and more or less fixed demand—a situation that would have reduced gas prices significantly in a market economy. Instead, the Russian government approved an 8.5% increase in regulated prices (which apply only to Gazprom) at the end of 2022 to compensate partially for lost export revenues.[29] The Federal Anti-Monopoly Service more recently backed further increases of 8%; the first took place in July 2023. and the second is scheduled for July 2025.[30]

From the outside, it appears that Russia's leadership expected success in its attempt to use natural gas supplies for political leverage, and accordingly it did not develop a contingency plan for Russia's natural gas industry.

Opportunities and challenges

Official Russian forecasts suggest that Russia's pipeline gas exports will decrease further during 2023, from 100 bcm to 50 bcm, with approximately half going to Europe and half to China.[31] Ironically, by slashing its exports to Europe, Russia would achieve its long-term goal of diversifying gas exports by 2035 more than a decade ahead of schedule.[32]

The geopolitical forces driving these changes seem unlikely to weaken significantly without a lasting resolution of the ongoing war in Ukraine. Transition to a frozen conflict would not address European concerns surrounding reliance on Russian energy imports. Similarly, the owners of the Nord Stream pipelines are quite unlikely to repair the route's expensive underwater damage before the end of the war, if ever. Conversely, military action or commercial disputes between Russia and Ukraine could easily lead to further reductions in natural gas transit at any time. The TurkStream pipeline is already operating close to its maximum capacity and therefore could not deliver increased volume using its existing infrastructure; sanctions prevent building new infrastructure, notwithstanding Russia's calls to

29 Vladimir Afanasiev, "Russia Approves Big Hikes in Gazprom's Domestic Gas Prices," *Upstream*, July 19, 2023, https://www.upstreamonline.com/production/russia-approves-big-hikes-in-gazprom-s-domestic-gas-prices/2-1-1488101.

30 Ibid.

31 Валерий Воронов, «Трубный вопрос: российский експорт газа может упасть вдвое в 2023 году,» *Известия*, April 27, 2023, https://iz.ru/1504519/valerii-voronov/trubnyi-vopros-rossiiskii-eksport-gaza-mozhet-upast-vdvoe-v-2023-godu.

32 In its energy strategy to 2035, released in 2020, Russia's government set a goal of directing 50% of its energy exports to Asia by 2035. See Government of the Russian Federation, «Энергетическая стратегия Российской Федерации на период до 2035 года,» 75, http://static.government.ru/media/files/w4sigFOiDjGVDYT4IgsApssm6mZRb7wx.pdf.

develop a Russian-Turkish gas hub.[33] As long as the conflict endures, observers can reasonably expect that Russian pipeline gas exports to the West will remain at current levels or decrease.

Russia's stagnant domestic market is unlikely to be able to absorb a substantial share of excess gas volumes, nor will domestic price increases offset the staggering decline in exports. This leaves huge gas volumes stranded inside Russia, even if gas production decreases by another 8–10% in 2023, as Russia's energy minister has suggested.[34] Gazprom will likely absorb much of the reduction by allowing natural decline at its most marginal wells in Western Siberia and at its main balancing assets, the Bovanenkovo and Zapolyarnoe fields in Yamal.[35]

Looking ahead, Russia's gas industry will need to find new customers to replace revenue lost from a gas market of the EU's scale, while contending with technology sanctions and financial constraints that limit its freedom of maneuver in doing so. Technical challenges include limited pipeline capacity to new destinations as well as limited LNG liquefaction and shipping capacity and restricted access to these technologies. Moreover, reduced earnings and growing tax pressure are limiting capital availability for investments in overcoming these obstacles.

Russia's political leadership and gas industry are now discussing several options:

- Boosting domestic natural gas demand
- Increasing exports to post-Soviet countries in the Caucasus region and in Central Asia
- Increasing exports to Asia, especially to China
- Developing LNG production and export capacity in Russia's Arctic, to facilitate global LNG exports and limit the need for additional pipelines

Each of these options poses its own problems for Russia's government and for energy sector companies.

Boosting domestic demand

Plans to boost domestic demand include expanding the use of gas in power generation, heating, industry, and transportation. In heating, this would require expanding gasification from 73% today to 82.9% by

33 Susanna Twidale and Nora Buli, "Putin Touts Turkey Gas Hub While Europe Looks to Cut Consumption," *Reuters*, October 13, 2022, https://www.reuters.com/world/putin-touts-turkey-gas-hub-while-europe-frets-over-supply-2022-10-13/.

34 Василий Милькин, «Падение добычи газа в России замедлилось,» *Ведомости*, August 24, 2023, https://www.vedomosti.ru/business/articles/2023/08/24/991619-padenie-dobichi-gaza-v-rossii-zamedlilos.

35 Vitaly Yermakov, "'Catch 2022' for Russian Gas: Plenty of Capacity amid Disappearing Market," Oxford Institute for Energy Studies, January 2023, https://www.oxfordenergy.org/publications/catch-2022-for-russian-gas-plenty-of-capacity-amid-disappearing-market/.

2030.[36] Russia's weak economic performance makes this expansion harder, in that demand for power and heat are not increasing, except in the energy-intensive defense industry. Thus using more gas for power and heat would require fuel switching, especially from coal, an industry in which firms are also hoping to secure additional domestic sales. While the economic consequences of Russia's invasion are forcing President Vladimir Putin to make more decisions that inflict pain on key economic constituencies, this option would require Russia's top officials to make choices they have typically sought to avoid in the past.

Officials are also considering developing additional industrial demand, including in nitrogen fertilizer production. However, Russia's stagnant economy has limited domestic demand for these products. Moreover, industrial projects require foreign technologies and have long lead times.

As in the power sector, using natural gas in transportation would require expensive new distribution infrastructure as well as switching from other fuels, in this case from gasoline and (more likely) diesel.

Increasing exports to post-Soviet countries

Russia's government has already been working to expand gas exports in the Caucasus region and in Central Asia. In November 2022, Russia signed a deal to supply natural gas to Azerbaijan, but some in the EU raised concerns about these supplies, which undercut EU efforts to limit dependency on Russia,[37] and Azerbaijan did not extend the deal in 2023.[38] In parallel, Putin has proposed a trilateral gas union with Kazakhstan and Uzbekistan that would allow Russian gas into their pipeline networks[39] and supply up to 10 bcm/year to their domestic markets. While the two Central Asian countries were initially quite skeptical toward Putin's proposal, they face domestic gas deficits that could make it painful to satisfy their export obligations to China;[40] Uzbekistan seems to have changed its attitude and has agreed to accept 2.8 bcm/

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36 Валерий Воронов, «Трубный вопрос: российский экспорт газа может упасть вдвое в 2023 году,» *Известия*, April 27, 2023, https://iz.ru/1504519/valerii-voronov/trubnyi-vopros-rossiiskii-eksport-gaza-mozhet-upast-vdvoe-v-2023-godu.

37 European Parliament, "Increased Gas Exports from Russia to Azerbaijan," Policy question for written answer P-003854/2022, November 28, 2022, https://www.europarl.europa.eu/doceo/document/P-9-2022-003854_EN.html#:~:text=There%20are%20reports%20that%20Gazprom,and%20March%202023%5B1%5D.

38 "Azerbaijan's Gas Exports to the EU Face Challenges," *Economist Intelligence*, July 10, 2023, https://www.eiu.com/n/azerbaijans-gas-exports-to-the-eu-face-challenges/.

39 «Путин предложил создать трехсторонний газовых союз,» *UZ Daily*, November 29, 2022, https://www.uzdaily.uz/ru/post/73735.

40 Akos Losz and Tatiana Mitrova, "Central Asia's Overlooked Energy Crisis: What It Means for the Global Gas Market," Center on Global Energy Policy at Columbia University–School of International and Public Affairs, March 28, 2023, https://www.energypolicy.columbia.edu/central-asias-overlooked-energy-crisis-what-it-means-for-the-global-gas-market/.

year starting in October 2023.[41] Nevertheless, both prices and payment terms are likely far less attractive to Russia than those of its past deals in Europe.

Increasing exports to Asia

Russia's authorities are determined to build up pipeline exports to Asia, a large and growing market neighboring Russia's Far East. Gazprom first tried to ramp up its pipeline exports to China via the existing Power of Siberia 1 pipeline, with 38 bcm in annual capacity, but exports reached only 15.5 bcm in 2022. Not until December 2022 could Gazprom launch operations at its Kovykta field, which will provide additional gas for the Power of Siberia 1 pipeline.[42] Until then, the Chayanda field was the sole source of supply for Power of Siberia 1. Chayanda alone could not meet the pipeline's full capacity.

In addition, Russia and China signed a new intergovernmental agreement on gas deliveries via the Far Eastern route on January 31, 2023. The agreement defines key parameters of a 10 bcm/year gas supply contract inked by Gazprom and the China National Petroleum Corporation (CNPC) on February 4, 2022, three weeks before Russia's invasion of Ukraine.[43]

Moscow's biggest effort is the Power of Siberia 2 project, officially known as Soyuz/Vostok, which is intended to deliver up to 50 bcm/year of natural gas to China through Mongolia. If achieved, this volume would be comparable to that of Nord Stream 1 or Nord Stream 2. Yet the two sides have made little progress on Soyuz/Vostok since January 25, 2022, when Gazprom announced that it had completed the feasibility study for the proposed 960 km pipeline. Russia and China have yet to sign a contract; China's willingness to proceed will determine whether they eventually do so. Russia's gas exports through Power of Siberia 1—with terms finalized shortly after Russia's annexation of Crimea—are already China's lowest-priced gas imports, generating revenue for Russia that is far below European levels.[44] Geopolitical conditions surrounding the new projects give China even greater leverage over pricing and other terms.

Developing LNG production and export capacity

Russia's government is also working to promote aggressive growth of LNG production and exports from the Russian Arctic—a prewar plan that Russian firms (led by Novatek) are eagerly embracing. Russia's goal is

41 «Газовый союз России, Узбекистана и Казахстана может расшириться,» Подробно.уз, August 11, 2023, https://podrobno.uz/cat/uzbekistan-i-rossiya-dialog-partnerov-/gazovyy-soyuz-rossii-uzbekistana-i-kazakhstana-mozhet-rasshiritsya/.

42 President of Russia, "Launch Ceremony of Kovykta Gas Field," December 21, 2022, http://en.kremlin.ru/events/president/news/70157.

43 Chen Aizhu, "Russia, China Agree 30-Year Gas Deal via New Pipeline, to Settle in Euros," *Reuters*, February 4, 2022, https://www.reuters.com/world/asia-pacific/exclusive-russia-china-agree-30-year-gas-deal-using-new-pipeline-source-2022-02-04/.

44 Sergey Vakulenko, "What Russia's First Gas Pipeline to China Reveals about a Planned Second One," Carnegie Politika, April 18, 2023, https://carnegieendowment.org/politika/89552.

to quadruple LNG production by 2035.[45] This will require large-scale commissioning of new LNG capacity.

Two projects are currently under construction: Novatek's Arctic LNG 2 plant, with capacity of 19.8 Mmt (million metric tons), or about 27 bcm, per year; and Ruskhimalliance's Baltic LNG plant, with a capacity of 13 Mmt, or about 18 bcm, per year.[46] Other projects await final investment decisions, including Novatek's Ob LNG (6.6 Mmt/year, or around 9 bcm/year), Murmansk LNG (19.8 Mmt/year, or approximately 27 bcm/year), and YATEK's Yakutsk LNG (up to 18 Mmt/year, or nearly 25 bcm/year).[47] So far Novatek has succeeded in delivering all its projects on time and on budget. With its new technologies, gravity-based platform construction in Murmansk, and patented "Arctic Cascade" liquefaction technology, Novatek appears able to scale up manufacturing of liquefaction plants. Novatek's combination of these measures may allow the company to expand LNG production at lower costs and without foreign technologies.

Western economic sanctions have cut off access to key technologies, severed partnerships with international companies, isolated Russian players from the Western capital markets, and made it difficult to obtain spare parts, consumables, and services for existing equipment. The United States in particular is regularly announcing new sanctions, such as September 2023 measures that explicitly target the Arctic LNG 2 project and will also affect Yamal LNG.[48] However, Russian oil and gas companies are creative, adaptive, and efficient; with an appropriately supportive regulatory environment, state funding, and the elimination of bureaucratic obstacles, Russia's private companies might well be able to deliver these new LNG projects. The biggest constraint would probably be shipbuilding, which is dominated by state-controlled companies and far less efficient. That said, building capital-intensive new LNG plants and shipyards in the Arctic would require huge upfront investments, massive state support, and tax breaks.

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45 Григорий Гончар, «Производство СПГ в России должно вырасти в 4 раза к 2035 году,» *Ведомости*, September 10, 1023, https://www.vedomosti.ru/industry/energy_future/articles/2023/09/11/994392-proizvodstvo-spg-v-rossii-dolzhno-virasti.

46 Ibid.

47 Ibid.

48 U.S. Department of State, "Imposing Further Sanctions in Response to Russia's Illegal War against Ukraine," September 14, 2023, https://www.state.gov/imposing-further-sanctions-in-response-to-russias-illegal-war-against-ukraine/.

03

Conclusions

Some voices in Russia—and some in Europe—continue to express hope for partial restoration of the gas trade after the end of Russia's war in Ukraine. Nevertheless, loss of trust, the destruction of long-term contractual relationships, and several ongoing legal cases surrounding nationalized assets in Russia and in Europe seem likely to have prolonged effects even if the war somehow ends in a manner that would allow both sides to consider reestablishing the Russia-Europe gas trade. New long-term contracts or even the renewal of existing contracts between Gazprom and key European importers now seem exceedingly improbable.

Absent a revival of Russia's natural gas industry, or at least reasonable expectations that such a revival could be possible, there are two broad pathways for Russian gas production and exports in the future: success in finding new markets for Russia's excess gas production or failure to do so. Each would have significant consequences for the global natural gas market.

Under the failure scenario, in which gas production declines and the country cannot build new markets (primarily in Asia), significant natural gas resources will be stranded inside Russia. At the level of the global energy balance, this will mean reduced natural gas availability, higher prices, and a lower share of natural gas in energy consumption outside the OECD. The last of these will almost automatically lead to higher coal consumption and larger greenhouse gas emissions over a longer period.

Even in the most negative scenario for Russia, however, the country will continue to export approximately 125 bcm/year in 2030.[49] This would be nearly half of Russian exports in 2021 but still enough for Russia to remain one of the leaders in the global gas market.

Alternatively, if Russia succeeds in expanding its pipelines to China and in shipping massive LNG export volumes from its Arctic fields to new natural gas consumers in China, Southeast Asia, South America, and other emerging markets, this would affect the contractual and financial framework of the global gas trade, making it more fragmented, increasing the share of non-dollar payments, and spurring development of alternative financial/contractual mechanisms to work around long-term Western sanctions.

The collapse of Russia's pipeline gas exports to Europe was not inevitable—it was the result of a geopolitical choice, a gamble that failed. As a result, Russia's government and its natural gas companies will try a new bet on LNG export development. Whether their strategy can succeed remains to be seen.

49 Kong Chyong et al., "Future Options for Russian Gas Exports," Center on Global Energy Policy at Columbia University–School of International and Public Affairs, January 19, 2023, https://www.energypolicy.columbia.edu/publications/future-options-russian-gas-exports/.

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