RUSSIAN OIL AND GAS EXPORTS: ONE YEAR OF WAR REVERSES DECADES OF ENERGY DIPLOMACY

INSIGHTS REPORT
COLOPHON

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Note: Climate Strategies commenced a project on Russian Energy Transitions in December 2021. Following the start of the Russian War in Ukraine in February 2022, we determined to continue the project to maintain insights in the rapidly evolving Russian energy sector. This research was co-authored by a group of experts in fossil fuel transitions and climate policy. However, a number of our experts appear under pseudonyms to protect their identity, as expressing critical views on Russian government policies incurs personal risk.
**EXECUTIVE SUMMARY**

**THE OIL SECTOR** has been targeted by significant Western sanctions. **Serious impacts of sanctions on oil exports are approaching** as the EU, the G7 and Australia banned seaborne imports of Russian crude oil from December 2022 and oil products from February 2023. The most important market is the EU, which accounted for 47% of Russian crude oil and 52% of Russian oil product exports in 2021. Also the price cap on Russian oil delivered by sea to other markets will have a significant impact, as the EU countries and the UK used to insure 85–90% of seaborne Russian oil. **The sanctions against exports of Russian crude oil have been mitigated mostly by soaring demand from India,** which increased its imports of crude oil from Russia by seventeen times in 2022; total crude-oil exports dropped significantly only in December 2022, when the EU embargo kicked in. Oil products are less likely to be saved by the Asian markets; both China and India prefer to use their own refinery capacity rather than paying higher prices for readily available oil products. **A lower price for Russian oil will weaken the revenues accruing to the Russian federal budget,** with potential negative social effects and instability. The Ministry of Finance of the Russian Federation plans not to replenish the National Welfare Fund in 2023 if the oil price falls below $70 per barrel. The price for Urals grade of crude oil (price benchmark for Russian oil) dropped to $50 in December 2022. **Various approaches have been applied to circumvent oil sanctions:** these include operating a ‘shadow fleet’ of unmarked oil tankers which do not indicate the oil’s destination or origin, and mixing Russian oil with oil from other countries for re-packaging. The prevalent official position is that the sanctions will gradually lose effect as Russian oil cargos find their way to markets, particularly in Asia, not involved in sanctions. However, longer distances and higher transportation costs, together with the price cap, reduce the commercial outlook.

**THE GAS SECTOR** was hit already in 2022 due to Russia’s decision to cut supplies to the EU. **Gas production fell by 11.8% largely because pipeline supplies to the EU and the UK were cut by 56%; Russia has very limited options of redirecting these pipeline gas volumes to other markets.** No sanctions have been imposed on Russian LNG exports, but this technology cannot replace pipeline gas deliveries, due to limited production and transport capacities. Planned expansion of LNG production is halted by Western sanctions on investments and technology exports to Russia. Reduced exports leave Russia with a gas surplus. The Russian authorities aim at increasing domestic gas use; however, this is not necessarily commercially attractive for gas producers. Some 70% of Russia’s heat and power is already generated by gas. As many of the remaining coal-fired plants are located in Eastern Russia, near large coalfields, redirecting gas supplies to these regions would be very costly. Gas that was intended to be delivered through the Nordstream 2 pipeline may be redirected to Northwest Russia. However, **new pipeline infrastructure is costly. Without revenues from gas exports, this will be almost impossible for Gazprom to finance** – which could lead to more openings for other domestic gas suppliers, threatening Gazprom’s semi-monopoly. Also in the case of gas, radically increased supplies to China are seen as a solution. China is currently served from fields in Eastern Siberia not connected to the integrated pipeline network, and receiving some LNG. However, Chinese interest in a new pipeline from West Siberia, which Russia has been advocating for years, has been very limited. The new geopolitical situation may eventually favour such a pipeline, but only if China obtains highly beneficial terms – which would reduce the economic value of this option in comparison to the revenues from lucrative European markets.
1. INTRODUCTION

24 February 2022, Russia started a full-scale invasion of Ukraine and became the world’s most sanctioned country. In 2022, the EU alone adopted nine sanctions packages against Russia, and one package is already adopted in 2023. A significant part of these sanctions is the phasing out of Russian oil and gas supplies to Western countries. In a matter of months, Russia has turned from being Europe’s reliable partner into a country which Europeans and European companies prefer to avoid – even regardless of their dependence, in particular, on Russian oil and gas.

The oil and gas sector is a cornerstone of the Russian economy. The main reason for sanctioning it is the intention to decrease Russia’s incomes and therefore worsen its ability to continue the war in Ukraine. Now, a year after the start of the full-scale war, it is already possible to draw some conclusions about whether Western sanctions helped reduce Russian oil and gas exports and whether Russia is able to redirect them to other countries.

This study assesses the developments of and future prospects for the Russian oil and gas sector under the conditions of Russia’s war in Ukraine, and the sanctions that it triggered. The report seeks to answer the following questions:
- How have the sanctions affected the volume of Russian oil and gas exports in 2022?
- Which options does Russia have for reorientation of its oil and gas exports?
- How does the domestic debate reflect the impacts of the sanctions on oil and gas exports?

The first section examines the role of oil and gas in the Russian economy. The second section provides an overview of the main sanctions imposed against Russia in the oil and gas sectors. The third part contains an analysis of the volume dynamics and routes of oil and gas exports from Russia. Finally, the fourth part focuses on how this has been received in the Russian society, outlining and examining Russian discussions about the possibilities of redirecting Russian oil and gas exports.

2. Ibid.
The largest Russian gas producer (68% of production in 2021) is state-owned Gazprom, followed by the private Novatek. Many Russian oil producers, including Rosneft, also produce gas.\(^5\)

In the years 2017-22, the share of the oil and gas revenues in the federal budget was fluctuating between 20% and 50%, the share in exports by value – between 45% and almost 60%, the share in GDP often exceeded 20% (Figure 1). Russian oil and oil products export incomes have been 3-4 times higher than incomes from pipeline gas and LNG exports (Figure 2).

The interdependence of Russia and Europe in the energy field dates back to the 1960s. USSR’s oil exports started a rapid growth in the 1960s more or less from zero, followed by a fast natural gas exports growth in the 1970s, made possible by the development of rich new oil and gas deposits in Western Siberia.\(^6\)\(^7\) Industrial and economic ramp-up of Western European countries demanded cheap energy resources. In 1964, the Druzhba oil pipeline, one of the biggest crude oil pipeline networks in the world (5,500 km), started to export oil from the USSR to the countries of the Council for Mutual Economic Assistance.

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Assistance (Comecon), such as Czechoslovakia, Hungary, Poland, and the German Democratic Republic. In 1968, Austria became the first Western European country to sign a gas supply contract with the Soviet Union, followed by West Germany, Italy, Finland and France. Just before its dissolution, the USSR produced 22% of global oil and 40% of global gas, and fossil fuel exports provided more than 40% of convertible currency earnings of the country, with oil exports alone accounting for about 30% of foreign exchange earnings.

After the crisis associated with the collapse of the USSR in the early 1990s, crude oil production in Russia has been steadily growing since 1998. During this time there were only two serious production declines, by the COVID-19 pandemic in 2020, and by the Russian invasion of Ukraine in 2022 (Figure 3). Natural gas production started to grow in the early 2000s after a stagnation in 1990s (Figure 4). Until 2020, there were three declines related to the 2008-2009 global financial crisis, the Russian invasion of eastern Ukraine and annexation of Crimea in 2014 and the COVID-19 pandemic in 2020. For 2022, a significant 11.8% production decrease to 672 billion cubic meters took place, mainly borne by Gazprom, which reduced supplies to Europe to historical lows.

Most of Russian oil has been transported to Europe by sea, primarily from Baltic and Black Sea ports (70-85%), as well as from Arctic terminals. The rest (less than 10%) was supplied via the Druzhba pipeline network, connecting Russian West Siberian oil fields to refineries in Poland, Germany, Hungary, Slovakia and

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Czechia. Some of its routes cross Ukraine. Most Russian gas was transported to Europe via pipelines, some of which transit Ukraine (Brotherhood, Soyuz, Progress, and the gas transportation route to Romania, Bulgaria and Türkiye), while others bypass it: Yamal-Europe crosses Belarus and Poland, and Nord Stream 1 run under the Baltic Sea, to reach Germany—(Nord Stream 2 under the Baltic sea was built but never put into operation).

Outside Europe Russian pipeline oil is supplied to China via the East Siberia-Pacific Oil (ESPO) pipeline as well as via Kazakhstan-China (Atasu-Alashankou) pipeline. Russian gas is supplied via pipelines to Türkiye (Blue Stream, Turk Stream and the gas transportation route through Ukraine, Romania and Bulgaria to Türkiye) and to China (Power of Siberia). Gazprom holds a monopoly on gas sold via pipeline. However, Russia also supplies LNG, from the terminals listed above. Gazprom is exporting LNG from Sakhalin to Asian markets, whereas the biggest plant – Yamal LNG - is controlled by Novatek and sells gas through intermediaries. Although initially destined for Asian markets, most of the gas from Yamal LNG has in later years ended up in Europe.

In 2021, Russia exported 47% (108 mln tons) of its crude oil by weight to EU countries, while exports to China also comprised a significant share – 31% (71 mln tons). Other important destinations were Belarus, Japan and South Korea. In the Russian exports of oil products, the EU dominated even more, accounting for 52% (76 mln tons) in 2021 (Figure 5). As to pipeline gas exports, the share of the EU in the Russian supplies was 64% (130 bcm). Other large buyers included Türkiye and Belarus, while China accounted for only 4%. Most of the Russian LNG destined to the EU as well – 42% (12 mln tons), though the shares of Japan and China were also high (Figure 6).

**Figure 5. Top Russian oil export destinations in 2021, % of total export**

**Figure 6. Top Russian gas export destinations in 2021, % of total export**

2. SANCTIONS AGAINST RUSSIAN OIL AND GAS

2.1 OIL SANCTIONS

After the start of the Russian invasion of Ukraine, many traders and refineries significantly reduced the volumes of their Russian oil purchases. Canada announced its Russian crude oil import ban on February 28, 2022, though it had not imported Russian oil since 2019. On 8 March 2022, the United States banned all imports of Russian oil, as well as liquefied natural gas (LNG) and coal. In 2021, the United States had imported from Russia about 700 thousand barrels of crude oil and oil products per day which comprised about 10% of its oil imports or 3% of its oil consumption. Australia banned Russian fossil fuels imports (including crude oil and oil products, gas and coal) as well as transport thereof from 25 April 2022, though in 2021, Australia did not import any crude oil or natural gas from Russia. Starting from 5 December 2022, the EU, G7 and Australia (collectively, the Price Cap Coalition) banned seaborne imports of Russian crude oil (most of imports) and from 5 February 2023 – imports of oil products, though some of these countries had already imposed bans earlier. Further, the Price Cap Coalition introduced a global price cap of USD 60 per barrel requiring buyers outside of the coalition countries that use coalition’s vessel servicing, insurance and financing to pay less than USD 60 per barrel for Russian seaborne crude oil starting 5 December 2022. Bulgaria has an exemption, which allows it to continue Russian seaborne oil imports until the end of 2024 based on the contracts that were concluded before 4 June 2022.

For Russian oil products two price caps were introduced starting 5 February 2023: USD 100 per barrel for products that trade at a premium to crude oil (e.g., diesel) and USD 45 per barrel for products that trade at a discount to crude oil (e.g., fuel oil or mazut, naphtha, etc.). In fact, price caps are institutionalizing discounts for Russian oil which had become a common practice after the start of the Russian War in Ukraine due to longer routes and higher risks related to Russian deliveries.

Pipeline deliveries of Russian crude oil are not under sanctions yet, however, Germany and Poland pledged to stop imports through the northern branch of Druzhba pipeline by the end of 2022, and Germany stopped imports through Druzhba on January 1, 2023, whereas Poland still imported small volumes in early 2023. Ironically, Germany might start buying Kazakh crude oil delivered through Druzhba if the Russian Energy Ministry approves it.

As a reaction to the oil price cap, Russian president Vladimir Putin signed a decree that bans oil exports from Russia to countries that would adhere to the price cap between 1 February – 1 July 2023. The date for a similar oil products export ban will be determined later.

The UK aligned its oil sanctions with the EU and G7. The UK ban comprises “the import, acquisition, supply and delivery of Russian oil and oil products into the UK and associated ancillary services in respect of these activities.”

It also covers operations that occur outside of the UK as well as technical assistance (repair, development, testing, etc. of the goods or technology), financial services, funds and brokering services related to the import, acquisition, supply and delivery of Russian oil and oil products into the UK. Further, the UK has prohibited maritime transport of Russian oil and oil products to and between third countries, as well as ancillary services for such transport. All UK bans entered into effect 5 December 2022 for crude oil and 5 February 2023 for oil products.

In March 2022, Russia demanded that its European customers pay for gas in Russian roubles. G7 rejected this demand. After this Russia gradually reduced gas deliveries to, or cut off completely, EU countries which refused to pay in roubles (e.g., Finland, Bulgaria, Poland, the Netherlands), and halted all gas exports via the key pipeline Nord Stream 1 (to Germany) first for 3 days and more permanently from 31 August 2022. In late September, both lines of Nord Stream 1 and one of the two lines of Nord Stream 2, which had not been commissioned yet, were mysteriously damaged by explosions. It remains uncertain what it would take to repair the damage. The construction of Nord Stream 2 was completed in 2021, but Germany cancelled its certification 22 February 2022, on the day of Russian formal recognition of the two breakaway regions in eastern Ukraine (the Donetsk People's Republic, DPR, and the Luhansk People's Republic, LPR) and just two days prior to the beginning of the war in February 2022. All this has had a major effect on gas trading between Europe and Russia; in early January 2023, Russia supplied the EU about 15% of the volume of gas it delivered in early January 2021.

### 2.2 GAS SANCTIONS

For many months only minor importers, the US and Australia, sanctioned Russian natural gas. For Europe ending dependence on Russian natural gas is harder than phasing out Russian oil. There are no alternative sources of supply readily available that can fully replace the huge volumes of gas transported from Russia via pipelines; whereas oil is sold on the world market and mostly transported by sea, pipeline gas ties exporter and importer together.

In March 2022, the EU published the REPowerEU plan that aimed, among other things, to reduce the EU's gas imports from Russia by two thirds by the end of 2022 and to end reliance on all Russian fossil fuels well before 2030. In May 2022, the EU published plans to end its reliance on Russian fossil fuels by 2027 and Germany announced its aim to stop Russian gas imports by mid-2024.
The EU imposed its first sanctions against Russian gas in November 2022 as the European Commission proposed a price cap on natural gas prices. Regardless of the initial skepticism of Germany, Austria and the Netherlands,\(^ {38}\) 19 December 2022 the EU energy ministers adopted a EUR 180 per megawatt-hour price cap for gas to take effect from 15 February 2023. If the price for the month-ahead Title Transfer Facility (TTF) derivatives, the EU’s most popular gas price benchmark, exceeds EUR 180 and is at least EUR 35 above global LNG prices for 3 working days, the cap is triggered and remains in place for 20 working days. In early January 2023, the month-ahead TTF derivatives were trading at EUR 65-77 per megawatt-hour.\(^ {39}\) Had the measure been introduced in 2022, it would have been triggered for 40 days in August and September.\(^ {40}\)

Much fewer countries have imposed sanctions against imports of Russian LNG. The United States, as mentioned, banned all energy imports from Russia, including LNG, from 8 March 2022. However, US natural gas imports from Russia were negligible. The UK banned Russian LNG imports from 1 January 2023, as well as related technical assistance, financial and brokering services.\(^ {41}\) In 2021, imports from Russia comprised 4% of the UK gas use. October 2022 was the seventh month in a row with no Russian gas imports.\(^ {42}\)

In 2022, apart from sanctions, some international energy companies divested Russian assets or significantly limited their activities in Russia. BP was the first international company to announce its exit as shareholder in Rosneft and other Russian businesses on 27 February 2022.\(^ {43}\) The following day, Equinor and Shell communicated similar decisions.\(^ {44,45}\) They were followed by Eni, Exxon Mobil and Wintershall Dea. Some companies, e.g. Austrian OMV, have not yet made final decisions on Russia. The French TotalEnergies, after resisting to exit Russia for almost 10 months, decided to “gradually withdraw” from its Russian investments.\(^ {46}\)

\(^{38}\) Deutsche Welle (2022). EU energy ministers fail to reach decision on gas price cap. URL: https://www.dw.com/en/eu-energy-ministers-fail-to-reach-decision-on-gas-price-cap/a-59083876


\(^{40}\) Mazneva E., Shiryaevskaya A. (2022). EU Gas Price Cap Would Have Been Triggered Over 40 Days This Year // Bloomberg. URL: https://www.bloomberg.com/news/articles/2022-12-18/eu-gas-price-cap-would-have-been-triggered-on-more-than-46-days


\(^{42}\) UK Parliament (2022). Imports of fossil fuels from Russia. URL: https://commonslibrary.parliament.uk/research-briefings/cbp-9523/#-text=The%20UK%20Government%20has%20committed%20to%20ban%20Russian%20LNG%20imports%20from%201%20January%202023

\(^{43}\) Some restrictions on technology were already imposed after the Russian support to separatists in eastern Ukraine. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014R0833&from=EN


3. RUSSIAN OIL AND GAS EXPORTS AND WESTERN SANCTIONS

3.1. PRICE IMPLICATIONS

The main Russian oil quality is Urals which is used as the price benchmark for Russian oil exports. Urals is a mixture of heavy sour oil from Urals and Volga regions with the lighter oil from Western Siberia. Russia also produces other qualities of crude oil, such as Siberian light, Sakhalin blend and ESPO blend. The price for Russian Urals is formed on the basis of the price of Brent – a light sweet grade of crude oil produced in the North Sea. Brent has almost always been a little more expensive than Urals ($1-2 per barrel) due to its higher quality. After the Russian invasion of Ukraine, this price difference increased and sometimes exceeded $30 per barrel (Figure 7, Figure 8). The EU oil embargo and the G7 price cap for Russian oil has reportedly significantly reduced the price of Urals. After 5 December 2022 it has been below USD 60 per barrel almost constantly, and the difference between Urals and Brent oil prices fluctuated around USD 30 per barrel. According to the Russian Ministry of Finance data, in January 2023 average Urals price was $49.48 per barrel, which is 1.7 times lower compared to January 2022. However, there is a growing number of reports on the increasing opaqueness of the Russian oil market and related doubts that Russian oil is really trading below the cap.

Figure 7. Urals and Brent oil prices in 2018-2023, $ per barrel

Figure 8. Difference between Urals and Brent oil prices in 2022-2023, $ per barrel

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According to the Russian Ministry of Finance, the average price of Urals oil in January-December 2022 was USD 76.09 per barrel compared to USD 69.0 per barrel in January-December 2021. However, in December 2022, the average price of Urals oil fell to USD 50.47 per barrel in comparison to USD 72.71 per barrel in December 2021. The federal budget for 2023 assumed an average annual Urals price of USD 70 per barrel.

At the same time, according to Rosstat data, in the third quarter of 2022, crude oil production costs in Russia amounted to USD 50 per barrel (21,500 roubles per ton), using the current exchange rate. Before the war, at the end of 2021, Deputy Head of the Russian Energy Ministry, Pavel Sorokin, estimated the cost of oil production in Russia in the range USD 15-45 per barrel. Thus, in December 2022 and January 2023, some of the Russian crude oil supplies were hardly profitable, and are likely to remain so without a weaker rouble. The Ministry of Finance of the Russian Federation plans not to replenish the National Welfare Fund (NWF) in 2023 if oil price is below USD 70 per barrel, and if it is “very low”, the Ministry will increase borrowing or use the funds of the NWF. This also confirms that the current price of oil around the price cap of USD 60 per barrel has serious consequences for the Russian economy. While prices actually paid for Russian oil may be above the price cap, it is the officially recognized prices that form the basis of tax and export duty revenues from the oil industry and therefore low official Russian oil prices reduce Russian budget revenues.

3.2. IMPLICATIONS FOR OIL EXPORTS VOLUMES

Figure 9 shows Russian crude oil purchase volumes (harmonized system code 270900) by 28 importing countries, which accounted for 91% of Russian crude oil export volumes reported in Russian customs statistics in 2021. By the end of 2022, the EU countries and South Korea had significantly reduced their purchases of Russian crude oil while the US and the UK had discontinued imports completely. This was offset mainly by increased purchases by India, and to a lesser extent by China. The total volume of purchases of Russian crude oil, after a slight decrease in the first months of the war, was compensated and in the second half of 2022 slightly exceeded the purchases of the previous year, up to December 2022, when the EU oil embargo took the force. In December 2022, the volume of Russian crude oil imports by importers analyzed was 24% lower than in the same month in 2021.

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Figure 9. Crude oil imports from Russia by largest importers of Russian crude oil, 2021-2022, monthly data, million tons

Source: Compiled by the authors on the basis of national customs statistics.

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56. RIA Novosti (2022). The Ministry of Finance will not replenish the NWF if the oil price is below $70 per barrel. URL: https://ria.ru/20221225/hb-1841170222.html (in Russian).
59. RIA Novosti (2022). The Ministry of Finance will not replenish the NWF if the oil price is below $70 per barrel. URL: https://ria.ru/20221225/hb-1841170222.html (in Russian).
Figure 10 shows Russian oil product (HS code 2710) purchases by 33 importing countries, which accounted for 80% of Russian oil product exports in 2021. Several large buyers of Russian oil products – the USA, Great Britain and South Korea – ceased purchases of Russian oil products shortly after the start of the war, while many EU customers have reduced their purchases. These volumes were almost fully compensated by alternative markets of Türkiye, China and India by the end of 2022.

3.3 IMPLICATIONS FOR GAS EXPORT VOLUMES

Data on the volumes of Russian natural gas (HS code 271121) imports by other countries is much more difficult to collect and analyze. For example, EU data is incomplete and does not contain information on the largest buyers. China in 2022 did not publish its pipeline gas import volumes from Russia – only the values. However, it is possible to form a general picture of 2022 developments. It is clear that in 2022 Russian pipeline gas deliveries to the EU have significantly decreased, and two out of four routes (Nord Stream 1 and Yamal) are no longer active (Figure 11). In the first 3 weeks of 2023, Russia exported 77% less gas to the EU and the UK than in the first 3 weeks of 2022 and 87% less than in the first 3 weeks of 2021. The total volume of Russia’s pipeline gas supplies to the EU and the UK in 2021 can be estimated at 146.2 bcm, in 2022 – at 64.5 bcm. Thus, in 2022, Russian gas supplies to the EU and the UK decreased by 81.7 bcm or 56%, which can be considered as a war gap. It should be noted that gas supplies to the EU through Ukraine continue, although they were reduced in 2022. But Gazprom has threatened to cut gas transit through Ukraine completely, and as the future of these deliveries is in doubt, the war gap may increase to 100 bcm.

In 2022, there were very few opportunities for redirecting Russian gas volumes that earlier had been delivered to the EU by pipelines. Besides the EU and some CIS countries, Russia supplies pipeline gas only to China and Türkiye. And deliveries to China are sourced from East Siberian fields, which are not connected to the pipeline network supplying gas to Europe. The first gas pipeline to China (Power of Siberia) was launched in 2019. In 2022 it delivered 15.5 bcm of gas, compared to 10.4 bcm in 2021. Thus, it compensated just 6% of the existing war gap, and it was new gas volumes, not those that had been intended for Europe. As for Türkiye, in the first 6 months of 2022, Russia supplied less gas than in the same period in 2021 – 13 bcm and 14.6 bcm, respectively. Thus, in 2022, Russian pipeline gas supplies to non-CIS countries decreased by about 50%. Deliveries to

Figure 10. Oil products imports from Russia by largest importers, 2021-2022, monthly data, million tons
Source: Compiled by the authors on the basis of national customs statistics.

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CIS countries in 2021 accounted for only 15% of Russian exports of pipeline gas, and in 2022 the volume of Russian gas exports to CIS countries is unlikely to have undergone fundamental changes.

Figure 12 outlines the supplies of Russian LNG to 15 importing countries, which accounted for 90% of Russian LNG exports in 2021. Russian LNG exports are not very diversified, with only 22 countries importing LNG directly from Russia in 2021, according to the Russian customs data. The collected statistics show that China increased its LNG imports from Russia by the end of 2022, though the total volumes have not changed much. India imports almost no LNG from Russia. In December 2022, the import volume by the countries analyzed was 19% higher than in the same month of 2021. Remarkably, in December 2022, the EU, which has not imposed sanctions against LNG imports from Russia, also increased the volume of Russian LNG imports by 19% compared to December 2021. However, it should be noted that the LNG statistics are not very straightforward in terms of the destination of the product, because most LNG is sold via traders and cargoes may change hands several times.

Figure 12. LNG imports from Russia by largest importers of Russian LNG, 2021-2022, monthly data, million tons
Source: Compiled by the authors on the basis of national customs statistics.

64. Compiled by the authors on the basis of national customs statistics
Despite ambitious plans for LNG expansion, the Russian gas industry is obviously on the brink of a huge crisis. In 2022, Gazprom reported a 46% drop in natural gas exports to non-CIS countries. Because of reduced exports, Gazprom's gas production in 2022 fell 20%, to 412.6 bcm, and if current trends continue in 2023, exports may fall by another 25%. At the same time, the company completed the first half of the year very successfully, and its record profits were used for the replenishment of the state budget. Thus, in the first six months of 2022, Gazprom posted a record profit of RUB 2.5 trillion (USD 41.3 billion) despite the decline in volumes of its gas exports to Europe but amid extremely high gas prices. The average price of Gazprom’s gas exports to non-CIS countries in the first half of 2022 increased more than 3.5 times compared to the same period in 2021. Due to the company’s excess profits, the government increased the mineral extraction tax for Gazprom by 1.248 trillion rubles (USD 20.65 billion, half of the profit) – from 1 September to 30 November 2022. The company had planned to pay this amount as dividends, and these dividends could be record not only for Gazprom, but for the whole Russian stock market. However due to the additional tax, these plans were abandoned. At the same time, Gazprom’s announced a very ambitious investment programme for 2023 at some 2.3 trillion rubles. In comparison, its 2022 investment programme comprised 1.98 trillion rubles, and its 2021 programme was just above 1 trillion rubles. With the grim export outlook, such plans look unrealistic.

PHASEOUT OF RUSSIAN OIL AND GAS: THE EXAMPLE OF GERMANY

Germany has been a major buyer of Russian oil and gas for decades, and its dependence on Russia has steadily increased. In 2021, Germany imported 34% of its crude oil and 55% of its natural gas from Russia to the value of EUR 19.4 billion (59% of Germany’s total imports from Russia). And Germany was eager to even deepen its reliance on Russia – a new gas pipeline connecting Russia and Germany – Nord Stream 2 – was completed in 2021, and it was to double the capacity of the operating Nord Stream 1, from 55 bcm to 110 bcm. After the war started, many observers assessed the possibility for a quick reorientation of Germanys energy purchases as limited. However, in November 2022, the volume of German crude oil imports from Russia had decreased to the level of the 1990s – 1.1 million metric tons, and from 1 January 2023, it was completely discontinued. The volume of oil product imports stood at its usual level until the end of 2022, however, from 5 February 2023, the imports ban of oil products took effect. Since 31 August 2022, Germany has received no Russian gas via Nord Stream 1 (Figure 11), which is the only direct pipeline connection to Russia. At the beginning of 2023, it is clear that if Germany ever resumes oil and gas imports from Russia, the relations between the two countries are unlikely to return to the level of early 2022. Germany will avoid such a strong dependence on the supply of oil and gas from one country, especially Russia, after its 2022 efforts to diversify its energy supply.

70. CLEW (2023). Germany, EU remain heavily dependent on imported fossil fuels. URL: https://www.cleanenergywire.org/fact-sheets/germanys-dependence-imported-fossil-fuels#morer
74. Ibid.
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3.4 ALTERNATIVE MARKETS FOR OIL

In 2022, India, China and Türkiye have increased their purchases of Russian oil, and at the end of 2022 they were buying about 70% of Russian crude oil delivered by sea. The main reason for these countries to start buying significantly more Russian oil are price discounts. However, only India increased its Russian crude oil purchases manifold – in November 2022, it imported 17 times more crude oil by weight than in November 2021, while China imported only 17% more (in December 2022 – 11% less than in December 2021), according to national customs statistics (Figure 9). In fact, taking into account the data of Chinese customs, the increase in purchases of Russian crude oil by China, which is widely discussed in mass media, looks exaggerated. In November 2022, China bought only 1.1 million tons more Russian crude oil than in November 2021, while India bought 4.1 million tons more in comparison to less than 0.5 million tons per month before the war.

China and India are expected to continue importing large volumes of crude oil from Russia in 2023. However, there are constraints to the growth of deliveries to these countries. First, the delivery time of Russian crude oil is long. Before the war western Russian ports (in the Black and Baltic Seas) were shipping Russian oil to Europe; now they are sending oil eastwards, including to China, which takes up to two months. Second, many Chinese buyers of Russian oil are cautious about Western sanctions, with some state-owned companies trying to avoid open purchases of Russian fossil fuels. Third, not all Chinese refineries can process Urals oil, since the latter contains high levels of mercury and vanadium. Finally, many Chinese refineries are already fully supplied due to their long-term contracts with Middle East countries. India may have fewer concerns: in October 2022, Hardeep Singh Puri, Indian Petroleum and natural gas minister, said that India would buy oil from wherever it could secure the cheapest price.

Various loopholes to circumvent the EU and US sanctions have been reported. There are signs that oil products (e.g. virgin gas oil, VGO) produced from Russian crude oil in India are exported to the United States regardless of the country’s ban on Russian fossil fuels. Tunisia's increasing imports of Russian crude oil has taken place in tandem with increased exports of oil products to the EU and the US (85% more in September-October compared to July-August 2022). And there are expectations that Türkiye will do the same with oil products by exporting its own diesel to the EU and importing discounted Russian diesel for its own use.

Also some large oil exporters increased Russian oil imports, for example, Saudi Arabia and other Middle Eastern nations. Saudi Arabia has been buying discounted Russian oil for its power plants to save its own oil for export. According to Argus, the Middle East has fast become a major outlet for Russian oil products.

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also signs that Russian crude oil is blended with other oil, repackaged and re-exported globally in Singapore. According to estimates from consultants, traders can enjoy a profit margin of about 20% from blending Russian oil with other crudes in Singapore, and this practice has been in place since October 2022.88

Some non-European countries are turning away from Russian oil – for example, South Korea, which bought seven times less crude oil from Russia in November 2022 in comparison to November 2021 (Figure 9) and almost ceased to import oil products from Russia in the second half of 2022 (Figure 10). However, some Russian oil products continue to reach South Korea through other countries. For example, companies in South Korea have increased their imports of naphtha from Tunisia, while Russia has increased its exports there. It is known that Tunisia buys very low volumes of naphtha for its own needs.89 Japan also almost stopped oil imports from Russia and has supported western sanctions against Russia but exempted crude oil from the Sakhalin-2 project from the price cap since it regards Sakhalin-2 as an important source of LNG and needs its oil as well.89 Japan also keeps its share in the Sakhalin-1 and Sakhalin-2 projects by complying with the new Russian rules while US and UK companies ExxonMobil and Shell have left the projects.91

3.5 ALTERNATIVE MARKETS FOR GAS

As described above, Russian natural gas supplies are very difficult to redirect. What will remain of Russian gas exports in 2023? Deliveries to former Soviet republics made up some 33.1 BCM in 2021 and will probably not be affected. Exports to China reached 7.6 BCM in 2021 and will obviously continue, in fact they are set to increase radically as the Power of Siberia pipeline is filled up to capacity – 38 BCM, which is planned for 2025. There are also European customers who seem likely to continue imports from Russia. Hungary imported 8.6 BCM in 2020 and Serbia some 2 BCM, mostly via TurkStream. We believe such volumes will be maintained. Turkey, a major importer of Russian gas, is likely to retain big imports. They were 16.4 BCM in 2020. This adds up only to some 80-90 BCM. It means that substantial amounts are taken out of the export markets.

What can Russia do with these superfluous volumes? An obvious answer is to cut production. And indeed, this has happened. In 2022 output was reduced by 11.7% - 89 BCM - compared to 2021.90 There is some flexibility in the production, but there are also constraints. Slashing output could have serious technical, and thus economic, consequences, as restoring wells later could be difficult and costly. The flaring of Russian gas at Portovaya on the Baltic Sea, the end-point of the pipe supposed to feed the Nordstream 1 pipeline, which was reported in the summer of 2022, could be interpreted as a consequence of problems controlling production. Obviously, flaring of this magnitude had severe environmental impacts, estimated as 9,000 tons of CO₂ every day.93

In the absence of export markets for the pipeline gas, the question is how much more gas the Russian domestic market can absorb. In 2021, 470 BCM was delivered to the Russian domestic market. The 100 BCM or so which may be withdrawn from the European market corresponds to about 37% of this volume. But since all the exported gas has belonged to Gazprom, the volume may also be compared to Gazprom’s share of domestic supplies, which was 247.2 BCM in 2021.94 Gazprom now has 40% more extra gas on its hands for domestic disposal. Already today Russia stands out with a very high share of gas in the energy balance, some 53% of primary energy consumption as of 2021.

Gasification of Russian regions has accelerated in the two last decades. Thus, in 2000 the level of gasification in Russia was less than 50%, while in 2010 it was 63.1%, and in 2019 it was 70.1%.\textsuperscript{95} Deliveries to domestic consumers increased from 420 bcm in 2016 to 470 bcm in 2021. At the same time, exports in 2021 amounted to only half of this volume — 249 billion cubic meters.\textsuperscript{96} In order to boost internal gas demand growth, the social gasification programme was adopted in summer 2021.\textsuperscript{97} This makes it possible to connect gas to houses located near gas pipelines free of charge. According to the programme, by 2030 the level of gasification of Russian regions should reach 82.9%.\textsuperscript{98}

It has officially been declared that volumes destined for the now abandoned Nordstream 2 pipeline, some 55 BCM will be used instead to gasify North-West Russia, where the gasification level is low. There are also ambitious plans for gasification of Eastern Siberia and the Far East, but gas there comes from sources not connected to the main grid and therefore does not involve superfluous gas from the European market. Deputy Prime Minister Novak maintains that gasification is not affected by “international trade conditions” and that Russian industry produces most of the required materials and equipment. Besides, “significant reserves of necessary imported equipment exist”. Gasification of small settlements and villages would undoubtedly have a positive environmental effect as it will replace coal for heating many places.

Critics maintain that gasification goes slowly and allege that Gazprom, which has been responsible, has had little interest due to the low prices paid by the Russian population, especially compared to lucrative exports.\textsuperscript{99} It is quite clear that extending pipelines into sparsely populated regions is very costly. It is therefore also argued that it would be more effective to gasify remote locations in a decentralized fashion by use of small-scale LNG projects.\textsuperscript{100} Such an approach will of course not take up any of the superfluous gas, but it would have the same environmental benefits as pipeline gas.

Fossil fueled plants in Russia’s power sector (heat & electricity) are already dominated by natural gas. 70 % of capacity is generated with gas as primary fuel. In 2016, the sector consumed 156 BCM. 25% was produced from coal, with the remainder made up of heavy fuel oil and turf.\textsuperscript{101} The replacement of coal by gas has been encouraged for many years, mainly for environmental reasons. According to Russian authorities, transferring from coal to gas cuts emissions of $\text{CO}_2$ by more than half. But many of the coal fired power plants are located in the eastern parts of Russia, close to big coal fields and far from gas pipelines. Transferring such plants to gas is exceedingly costly.

In many industrial sectors there is more room for gas. According to former Energy Minister Shafranik, much more gas could be used to produce fertilizers, and gas chemistry could be expanded.\textsuperscript{102} Such expansion could soak up significant gas volumes without replacing coal.

Generally, transportation is a constraint on changing the energy supply as well as expanding gas consumption. Pipelines have been built to reach specific areas or customers. Construction of new pipelines cannot be done overnight. Some flexibility is conceivable if there is excess capacity in pipelines.

Investment needs remain a serious challenge. Export revenues have traditionally covered investments in the domestic gas sector — carried out within the Gazprom system. With export revenue seriously curtailed this will
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no longer be possible, even if the company may save money from reduced investment in production. A probable implication is serious institutional change within the Russian gas sector, expanding the already big role of non-Gazprom producers and letting more players in to finance gas infrastructure – and sell gas - as well as liberalizing the gas pipeline network. Such development will not solve the financing of pipelines to unprofitable customers, which hitherto has been expected from Gazprom, though. State subsidies, or price reform will be required – creating its own problems.

3.6 TRANSPORT INFRASTRUCTURE ISSUES

Russia had been heavily relying on foreign tankers to transport its crude oil, and in 2022, its own tanker fleet was insufficient to redirect all Russian oil supplies from Europe to eastern countries. In addition, Russia has a growing need for ships, as the same ship now carries cargo longer due to the lengthening of the transportation distance. For these reasons in 2022 Russia reportedly amassed more than 100 ageing tankers to transport its crude oil in case it will become illegal for regular transporters to do so due to the oil price cap.\(^{103}\) Russia created what is called in oil industry a “shadow fleet” of estimated 200-300 ships owned by offshore companies in countries with lenient shipping rules and which are less dependent on western financial markets.\(^{104}\) Using shadow fleets is a common practice for Iran and Venezuela to avoid Western oil sanctions. Russia is using carriers previously involved in the transportation of Iranian oil\(^{105}\) and Chinese vessels.\(^{106}\) The share of tankers that deliver Russian crude oil and use Western services was estimated to have declined from 60% in summer 2022 to some 30% in early December 2022.\(^{107}\)

Analyzing the reorientation of Russian oil exports is complicated by the fact that up to a quarter of the recipients of Russian oil deliveries remain unidentified.\(^{108}\) Analysts expect that Russia will increasingly use sanction boosting techniques, including masking its crude oil or spoofing location data.\(^{109}\) Such techniques were also used by Iran and Venezuela.

Exports of oil products is an important issue for Russia, which is one of the world’s largest exporters of petroleum products. In recent years, Russian oil companies have been investing substantially in refining capacities. In 2021, Russian refineries processed 5.6 mln bpd of crude oil and exported 2.8 mln bpd of oil products.\(^{110}\) Unlike crude oil, there is no demand for Russian fuel oil (mazut) and diesel in Asia, and as a result, it will be extremely difficult to reorient the supplies of these products. China and India are unlikely to significantly increase the volumes of oil product imports from Russia, since they have their own large refining capacities and prefer to import cheap crude oil to process it domestically. However, the price cap for oil products is harder to implement due to the lack of global benchmarks for oil products and difficulties determining the country of origin. Further, problems with exporting mazut which is generated as a side product of gasoline, diesel and kerosine production, led to its overproduction and filling-up of storage capacities. In April 2022, the largest private Russian oil company (Lukoil) suggested that mazut should be used for domestic power and heat generation, as storage facilities for mazut were at their maximum capacity.

Natural gas from western fields cannot be easily redirected to eastern countries. This makes Russian gas market very inelastic. For

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years, Russia has been promoting an additional pipeline to China – Power of Siberia 2 – now positioning it as a replacement for Nord Stream 2. The Power of Siberia 2 pipeline would connect western gas fields (Yamal peninsula reserves which used to be the main source of Russian gas supply to Europe) through Mongolia with China. However, this pipeline has been discussed since 2014, Gazprom started a feasibility study on the project in 2020, and the start of gas deliveries may be expected not earlier than in 2030. If ever built, the Power of Siberia 2 pipeline may be able to deliver 50 billion cubic meters (bcm) of gas a year, which is slightly less than each of the Nord Stream (each of them had a capacity of 55 bcm).

Many analysts agree that China does not need additional large-volume gas deliveries from Russia, and negotiating the Power of Siberia 2 pipeline will be extremely complex and may take years. Russia is pretending that start of the project is imminent, but China is unwilling to sign up. However, it is possible that for political reasons the deal will be announced, whereas, in reality, finalization and price negotiations will drag out for years.

Western fields could in principle convert their gas to LNG and supply it to Asian countries, but this is presently not technically possible because of technology sanctions. It would take years to implement such schemes. Thus, it is quite obvious that in the short-term Russia will have to cut gas production from its West Siberian fields. Apart from volume limitations, the economic attractiveness of deliveries to China is much lower than sales to Europe have been. Before the Russian War in Ukraine, Russia was estimated to supply its gas to China for $3/MMBtu (through the Power of Siberia) compared to $10-$25/MMBtu for its deliveries to Europe.

From about 2020, there was a growing understanding in parts of the Russian elite that a global energy transition was inevitable, and that in the long term, demand for Russian fossil fuels would decline. The most progressive voices, such as Anatoly Chubais, who until the war served as Special Representative of the President of Russia for Relations with International Organizations to Achieve the Sustainable Development Goals, expected that the Russian economy would undergo a massive transformation over the next 30 years because of the energy transition, and warned that the economy would be vulnerable to such changes, but also argued that the transformation would open up opportunities to create new industries. A similar opinion was expressed by German Gref, the Chairman of Sberbank, who also believed that the energy transition would help form a new, more stable model of economic development in the country. Alexei Kudrin, who in the beginning of 2022 served as the Chairman of the Accounts Chamber and was a former Finance Minister, said that Russia’s budget system needed to get prepared for the energy transition, since in 20 years, oil might cease to be the main source of Russian budget revenues. At the same time, it was widely believed that imminent significant changes were exaggerated. Just before the war, Russia seemed ready to take action on the energy transition, but most of the discussed decarbonization measures were for the long-term, and they were mostly promises.

Nevertheless, the Russian understanding of the energy transition often was (and still is) very peculiar. The development of certain types of conventional energy has been presented as a contribution to the energy transition. For example, Rosneft highlighted plans to bring the share of natural gas to over 25% of total Rosneft production. Particular hopes were placed on the absorption of carbon dioxide through ecosystems, including forests, as well as on carbon storage in depleted oil and gas fields and salt mines. The prevalent Russian perception of the energy transition was reflected in a speech by Deputy Prime Minister Alexander Novak at the 2022 Gaidar Forum. According to him, Russian traditional energy carriers are competitive and therefore Russia will be the last to leave this market, but it is necessary to diversify production. To do so, Russian companies are actively developing production of LNG, petrochemistry and gas chemistry – Russia’s new export items that will be in demand in the coming years.

There was also confidence that Russia would be able to find its place in new energy sectors. In particular, such advantages of Russia as a developed gas transportation infrastructure and the possibility of using Nord Stream 2 not only for gas exports, but also for hydrogen exports were discussed. After the start of the war, Novak opposed revising the strategy to achieve carbon neutrality in the country. Presidential climate adviser Russian

120. Kommersant (2022). Kudrin believes that in 20 years oil will cease to be the main source of replenishment of the Russian budget. URL: https://www.kommersant.ru/doc/5159448 (in Russian).
123. Kommersant (2021). Gref considers Russia one of the most attractive markets in connection with the energy transition. URL: https://www.kommersant.ru/doc/5116560 (in Russian).
127. Tikhonov S. (2022). Novak: Russia will be the last to leave the traditional energy market // Rossiyskaya Gazeta. URL: https://rg.ru/2022/01/14/novak-s-rvnka-tradicionnoy-energetiki-rossiia-ujdet-poslednej.html (in Russian).
In the first months of the war, Russian authorities as well as representatives of the Russian oil and gas sector were skeptical about the possibility of a complete EU oil embargo. They were convinced that the European Union would not be able to replace Russian gas and oil within the next 5-10 years. Their arguments were that an embargo would drive up prices to unprecedented levels, logistics costs would also increase, European refineries would have to reconfigure equipment for other grades of oil, and the lack of infrastructure would prevent the EU from rapidly replacing Russian pipeline gas with LNG.

Options for reshuffling oil supplies were identified by Putin in April 2022. He called for increasing energy supplies to the domestic market, reducing domestic prices if possible, reorienting exports to the South and East, and developing deep processing of oil and gas. Another possibility loomed at the end of March 2022, when it became known that Russia would develop methods to circumvent sanctions together with Iran. Partners from the Islamic Republic shared their experience “for getting out of the influence of American domination and hostile countries”. Such methods include, for instance switching to national currencies when trading with partners and sending oil tankers to Europe labeled “destination unknown”. Also the creation of a national Russian oil brand, prices for which would not be tied to prices for other oil brands, as Urals are tied to Brent prices now, has been raised. This would allegedly help to combat the EU price cap, however, similar previous initiatives have not materialized.

As the European embargo gradually became a reality, these methods were used with increasing intensity, especially bypassing sanctions and finding new markets. And there were numerous reports in the Russian mass media, with links to foreign sources, e.g. on Russian oil being reloaded in a small port in Egypt or mixed with oil from other countries in Singapore, as well as on the usage of Iranian ghost tankers to avoid sanctions. The shadow shipping and financial infrastructure of Moscow has grown significantly in 2022, and its further expansion should be expected in the near future. With a high probability, the EU will buy more diesel, fuel oil and naphtha in Asia, and Russia will try to supply more crude oil there and thus compensate for the losses from the embargo of petroleum products.

Some of the new markets mentioned are quite exotic and unlikely to change the situation. For example, in September 2022, Russia discussed renewal of its oil supplies to North Korea which were stopped in 2020 due to the pandemic. Taliban (officially recognized as terrorists and

132. Pavlenko O. (2022). Novak is convinced that the European Union will not be able to replace Russian gas and oil within 5-10 years // Kommersant. URL: https://www.kommersant.ru/doc/5315901 (in Russian).
banned in Russia) intended to establish barter trade with Russia and was ready to buy 1 million barrels of oil in exchange for Afghan products.\textsuperscript{143} Bangladesh was trying to negotiate the supply of Russian oil as well, amid local protests demanding lower fuel prices.\textsuperscript{144}

An important issue discussed in the Russian press in early 2023 was revision of the tax system in the oil industry. The greatest risk for the Russian budget is not the decline in exports of oil, gas and coal, but the fall in production, which will lead to a decrease in tax revenues.\textsuperscript{145} Forecasts of a drastic reduction in production and exports of Russian oil have not yet come true, but Russian budget revenues have been threatened because of Urals trading at an increasing discount to Brent prices. Now the Russian authorities want to tie the calculation of oil taxes to the price of Brent, which should encourage oil companies to either reduce discounts or pay more taxes. At present, the Russian authorities are most interested in how to reduce the discount on Urals and stabilize the budget's oil revenues.\textsuperscript{146}

In February 2023, it was announced that production in March would be cut by 0.5 million barrels per day, approximately 5 per cent.\textsuperscript{147} Processing of oil in Russia which was discussed as a way to compensate for the decreasing export volumes, is also constrained. In the coming months, Russia may face a scenario in which refining volumes will decrease. Since 5 February 2023, there have been restrictions on the supply of oil products to Europe, and it is difficult to redirect them to the east, since India and China have their own developed processing systems. This means that volumes of crude oil that were sent for processing within Russia to create high added value will be sold with a discount for processing in other countries.\textsuperscript{148} Moreover, sanctions against Russia and restrictions on oil imports from Russia have led to Russian companies losing control over many foreign refining assets, which had only begun to bring them good income. For example, in mid-September 2022, Germany, where several Rosneft plants are located, took over the management for six months of two Rosneft structures that own three refineries.\textsuperscript{149} At the end of 2022, the Italian authorities introduced temporary management at the Lukoil refinery in Sicily for up to 12 months.\textsuperscript{150}

In the sphere of gas, there are several discussions in Russia. One of the discussed options is to create a gas hub in Turkey. According to Vladimir Putin, a gas hub in Turkey is a "quite realistic project", and it was proposed since "working directly with European partners is very difficult".\textsuperscript{151} For Europe it makes no sense to create a new infrastructure that would allow it to import more Russian gas.\textsuperscript{152} Turkey stated that it has started to do its part of the gas hub project with Russia.\textsuperscript{153} However, its interest is to get discounts on Russian gas, as well as

\begin{itemize}
  \item \textsuperscript{144} Keffer L. (2022). Bangladesh wants to agree on the supply of Russian oil // Kommersant. URL: https://www.kommersant.ru/doc/5602717 (in Russian).
  \item \textsuperscript{147} Kommersant (2021). Road to hard oil. URL: https://www.kommersant.ru/doc/5098396 (in Russian).
  \item \textsuperscript{149} RBK (2023). Россия сократит добычу нефти на 500 тыс. баррелей в сутки, 10 February. https://www.rbc.ru/econom_ics/10/02/2023/3de9f64b7947b20ff0ca7377v?cid=4eef7a65a802f466.
  \item \textsuperscript{154} Keffer L. (2022). France considers the idea of gas supplies from Russia through Turkey meaningless // Kommersant. URL: https://www.kommersant.ru/doc/6099206 (in Russian).
  \item \textsuperscript{155} Fedotova M. (2022). Turkey has started doing its part of the work on the gas hub project with Russia // Kommersant. URL: https://www.kommersant.ru/doc/6033152 (in Russian).
\end{itemize}
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defer payments.\textsuperscript{156} Ankara might ask Moscow for a discount of more than 25% on the supply of Russian gas for 2022 and 2023 or to defer payments for gas supplies until 2024.\textsuperscript{157} And not a single country or company has yet volunteered to purchase gas through a potential Turkish hub.

Another option for Russia is to boost trade with neighboring countries — e.g. through the “trilateral gas union” with Kazakhstan and Uzbekistan, proposed by Russia.\textsuperscript{158} In January 2023, Gazprom signed cooperation agreements with Uzbekistan and Kazakhstan.\textsuperscript{159} However, in December 2022, Uzbek Energy Minister Zhurabek Mirzamakhmu dov stated that Uzbekistan intends to import energy resources, including gas, only on the basis of commercial contracts. According to him, participation in “some kind of alliance or union” is not required.\textsuperscript{160}

The Prime Minister of Kazakhstan, Alikhan Sma ilov, also stated in January 2023 that all relations in the gas sector would be built on a commercial and mutually beneficial basis.\textsuperscript{161}

Russia might also find other potential partners, e.g. Pakistan and Afghanistan, either using the infrastructure of Central Asia, or through swaps from the territory of Iran.\textsuperscript{162} Putin said that pipeline gas supplies to Pakistan are possible if the issue of stability in Afghanistan is resolved. He noted that part of the infrastructure for supplies has already been created in Russia, Kazakhstan and Uzbekistan. He added that Moscow and Islamabad have other interesting and large-scale projects, e.g. the Pakistan Stream project, which would provide for supply of LNG.\textsuperscript{163} The Philippines is in talks to buy fuel and other “key commodities” from Russia. According to the Philippine President Ferdinand Marcos Jr., the country’s national interests outweigh potential concerns about military action in Ukraine.\textsuperscript{164} Iranian Deputy Minister of Oil Industry Ahmad Asadzadeh said that Russian gas, under an agreement on swap supplies with Tehran, could also go to Azerbaijan, Armenia, Turkey, Iraq, Pakistan, southern Iran for export to the Persian Gulf countries. At the moment, the potential volume that Iran can receive through the northern borders alone is about 50 million cubic meters of gas per day.\textsuperscript{165} Theoretically more promising could be to increase exports to China through the construction of the second Power of Siberia pipeline. According to the Deputy Prime Minister Novak, the Power of Siberia 2 gas pipeline may actually become a replacement for Nord Stream 2 for Russia. The potential volume of gas supplies for the Power of Siberia 2 is estimated at 50 bcm.\textsuperscript{166} Power of Siberia 2 is being designed by Gazprom, but other companies are also interested in deliveries through this gas pipeline. For example, Rosneft wants to supply gas from its fields in Krasnoyarsk Territory and Irkutsk Region for Gazprom’s export project. However, given its own huge reserves, Gazprom is unlikely to be interested in receiving gas from other suppliers.\textsuperscript{167} However, China has not shown strong interest in the project and is only likely to go ahead with it if it can get very attractive conditions from Gazprom.\textsuperscript{168}

Another promising option might be to increase the production and export of LNG. In July 2022, the Russian Prime Minister Mikhail Mishustin said that Russia should increase the production


\textsuperscript{160} Urvachev L. (2022). Novak spoke about the negotiations to increase gas supplies to Kazakhstan and Uzbekistan // Kommersant. URL: https://www.kommersant.ru/doc/5774725 (in Russian).


\textsuperscript{162} Urvachev L. (2022). Novak spoke about the negotiations to increase gas supplies to Kazakhstan and Uzbekistan // Kommersant. URL: https://www.kommersant.ru/doc/5794229 (in Russian).


of LNG, as Russian industry will need additional resources in the coming years. He also believes that the development of LNG production will allow Russian energy resources to be more competitive on the international market.\textsuperscript{169} LNG is the only type of fuel from Russia where supplies to Europe increased in 2022.\textsuperscript{170} According to Eurostat, the EU imported 5% more LNG from Russia in 2022 than in 2021.\textsuperscript{171} However, it will definitely not be possible to compensate for the curtailed pipeline gas supplies to Europe by increasing LNG supplies.\textsuperscript{172} In addition, the implementation of LNG projects in Russia is difficult after the introduction of EU sanctions prohibiting the supply of key equipment.

Finally, there is a discussion to increase domestic gas supplies (gasification), as discussed above.\textsuperscript{173}

After the deterioration of relations with Western partners, the relevance of domestic gasification has grown significantly. In April 2022, Putin said that Russia needs to expand the gasification programme for its regions, and wherever possible, gas, either piped or liquefied, must reach the consumer.\textsuperscript{174} At the end of 2022, it was decided that starting from 1 March 2023, the social gasification programme would become indefinite, and it has been extended to cover medical and educational organizations.\textsuperscript{175} The possibilities of using export routes for gasification of Russian regions have also been discussed. In particular, the planned Power of Siberia 2 might be used for this, as well as the infrastructure of Nord Stream 2.\textsuperscript{176,177}

\begin{itemize}
\item \textsuperscript{169} Sapozhnikov A. (2022). Mishustin: it is necessary to develop LNG production in Russia // Kommersant. URL: \url{https://www.kommersant.ru/doc/5486968} (in Russian).
\item \textsuperscript{171} Eurostat (2023). EU trade. URL: \url{https://ec.europa.eu/eurostat/databrowser/view/DS-045409_custom_4619718/default/table}.
\item \textsuperscript{175} Zhandarova I., Tikhonov S., Trubilina M. (2022). Schools, kindergartens and hospitals will participate in the social gasification program // Rossiyskaya Gazeta. URL: \url{https://rg.ru/2022/12/01/goluboy-ogonek-2023.html} (in Russian).
\item \textsuperscript{176} Keffer L. (2022). Foreign Ministry confirms that Nord Stream 2 will be used to gasify northwestern Russia // Kommersant. URL: \url{https://www.kommersant.ru/doc/5523855} (in Russian).
\item \textsuperscript{177} Anokhin K. (2022). Gas will enter every house // Kommersant. URL: \url{https://www.kommersant.ru/doc/5733676} (in Russian).
\end{itemize}
Russian oil and gas exports to Europe have been developing for over half a century, and they survived the Cold War and the dissolution of the USSR. However, the real war that Russia started in Ukraine has completely changed the relations between Russia and Europe in the energy sector with the premium European energy market quickly closing for Russia. The most notable example is Germany, which has been increasingly reliant on Russian oil and gas until 24 February 2022, and since 1 January 2023 no longer depends on Russian supplies and imports of crude oil. Thus, the results of half a century of work and cooperation were destroyed by the Russian War in Ukraine in less than one year.

In 2022, Russian crude oil exports proved resilient, while its pipeline gas exports to non-CIS countries have decreased by almost 50%. The Russian natural gas war gap – the volumes of natural gas that Russia does not export because of the war – may be estimated at over 80 bcm. If gas transit through Ukraine is completely stopped, this value will reach 100 bcm.

The reorientation of crude oil supplies was the easiest, and in 2022 Russia managed to fully replace the released western supplies with eastern ones. This is because Russia mainly transports its oil through pipelines to western ports, and from there by sea. Instead of Western countries, it is now increasingly supplying oil to Asian countries, which are interested in such purchases, subject to substantial discounts. Such a reorientation is more labor-intensive, less profitable, but so far it has been possible almost in full volume. A lot more questions arise from the upcoming reorientation of oil products. The eastern countries have little interest in them since they prefer to buy cheap crude oil and use their own refineries. There are even more questions about the reorientation of gas exports, which were already reduced by about half in 2022. Russian gas was supplied mainly through pipelines and mainly to Europe, the western gas fields are connected by pipelines only to Europe, and the construction of pipelines to new markets will require up to 10 years of intensive work and significant investments. Increasing LNG production from already designated fields is constrained by technology sanctions, transforming presently pipeline oriented production to LNG is hardly thinkable. In addition, taking advantage of the situation, China and other potential buyers of additional volumes of Russian gas will demand substantial discounts.

In the near future Russia is likely to continue increasing its supplies of discounted crude oil to Asian countries, but it is unlikely to fully compensate for the loss of the European market. The total volume of oil product exports will also decline. A drop in export revenues for both crude and oil products looks inevitable. To maintain the volume of supplies, Russia can be expected to intensively seek evading sanctions, in particular, by masking the destination of tankers, reloading oil and mixing it with oil from other countries. The situation in the gas sector is much more complicated, due to the dependence of Russia on pipeline exports to the EU countries. Of all the options discussed, the most feasible ones are to expand supplies to China, including the construction of a new Power of Siberia 2 gas pipeline, as well as the continuation of domestic gasification. However, both processes will take several years and demand huge investments, and they are unlikely to fully compensate for the loss of the European market.

Russia may regain some of Europe’s oil and gas markets if it ends the Russian War in Ukraine, but it is unlikely to become the EU’s main energy partner ever again. In the most optimistic case for Russia, over the course of several years, it could become just one of several large suppliers to Europe. As to the Asian perspectives, Russia will become
increasingly dependent on China with the latter dictating lowest prices and offering less profitable and less reliable cooperation than Europe.

Pushing the discussion a little further, the war and the related restructuring of Russian energy exports will obviously have a negative effect on the Russian climate and energy agenda. The discussions in 2020-21 about the need for a radical overhaul of the Russian economy in favor of a low-carbon development and strict emission policies were to a large extent triggered by fear of Russia losing export revenues due to the energy transition in Europe and introduction of CBAM. After February 24, 2022 such arguments have lost most of their weight since western markets have become almost inaccessible anyway. In Russia efforts are now concentrated on the search for new markets for oil and gas and new ways of delivering fossil fuels, often over longer routes and with higher emissions, leaving almost no resources and no political will to exploit a low-carbon agenda. For many other countries, in particular for the EU, the Russian War in Ukraine and subsequent energy crisis is an impetus for an accelerated energy transition, which will increase the technological gap, widening the distance to the Russian economy further.
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