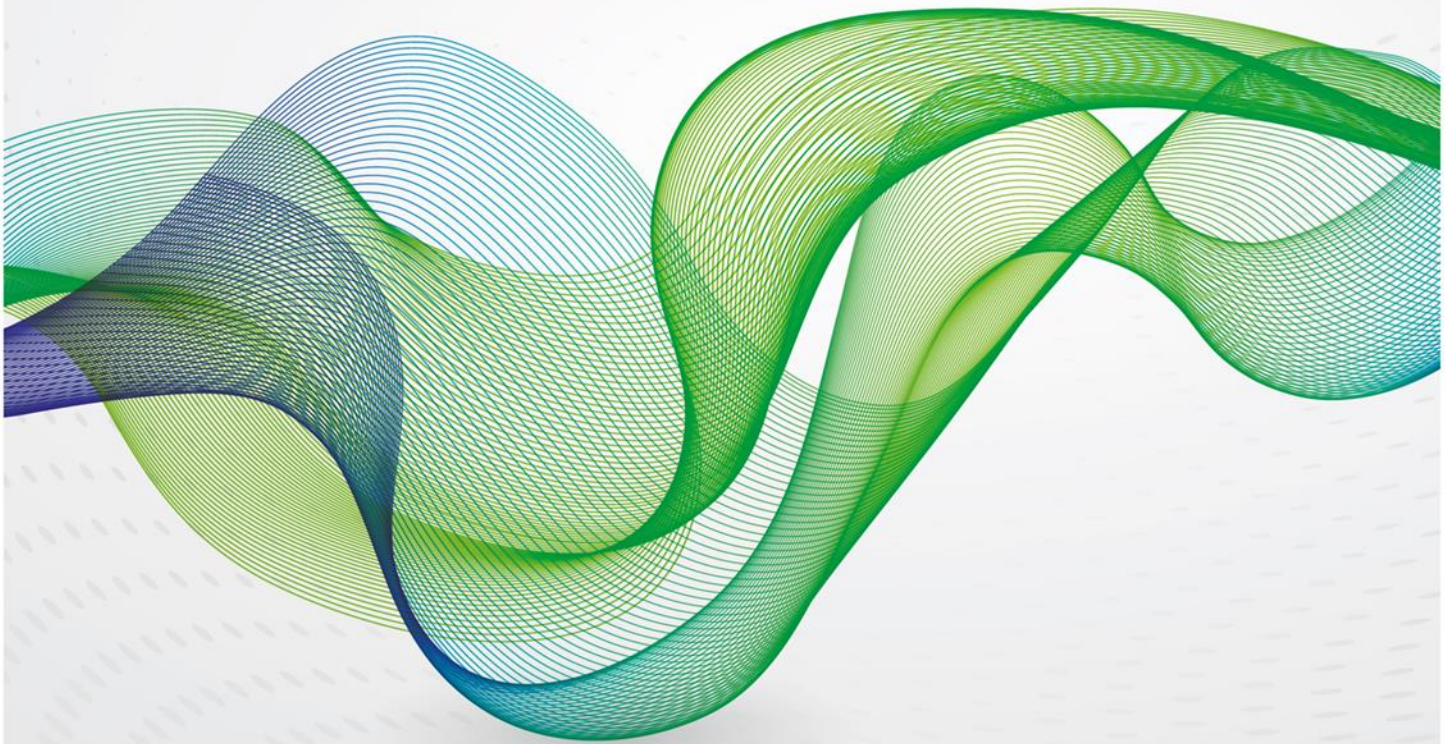


September 2021

# Big Bounce: Russian gas amid market tightness

## Key Takeaways for 2021 and Beyond





## Introduction

For Russian gas, 2021 has developed into a pivotal year, as the gas market pendulum has swung back from relative gas abundance and extremely low prices in 2020, to market tightness and very high gas prices so far in 2021.<sup>1</sup> The past two years, therefore, have represented two slopes in a 'V-shape' trend for the gas market at large and for Russian gas in particular.

As the world's largest pipeline gas exporter and an emerging significant LNG exporter, Russia seems to be a winning beneficiary of the market tightening. At the same time, gas buyers have been struggling to secure supplies even at premium prices and have been concerned about the availability of gas and possible energy insecurity over the coming winter.

With declining indigenous production in Europe and limited availability of LNG owing to the strong pull from premium markets in Asia, the European gas market is a case in point. Europe now demands greater flexibility from suppliers, in both price and the ability to swing gas deliveries. Many European analysts and market watchers expected that Russia as the largest swing producer and exporter would value an opportunity to expand its market share, at least in the short term, and quickly respond to a higher call on gas in Europe in 2021. Most recent reports show Russia's gas exports to Europe (including Turkey) up almost 20 per cent year-on-year, but this has proven to be insufficient to address a sudden void in Europe's gas balance.<sup>2</sup> Gas storage levels in Europe are at historical lows at the start of the heating season and gas prices have been testing record levels.<sup>3</sup>

Amid concerns about the sudden and sharp gas price escalation, numerous European media publications have suggested that Gazprom has been holding back supply intentionally to inflate prices and advance its geo-political goals (in particular pushing the case for Nord Stream 2 acceptance in Europe as the only way out of gas deficit). These assertions implicitly assume firstly, that Gazprom has spare productive capacity; secondly, that the evolution of the geographical distribution of spare productive capacity in Russia has not resulted in infrastructural constraints, and thirdly, that Gazprom can easily re-arrange the flows of its gas to deliver it to whichever trans-border point is required by European buyers. The aim of this comment is not to argue that all these assumptions are wrong, but to demonstrate the complexity of the issues surrounding them. In our previous publications we have provided a detailed analysis of the evolution of Russia's spare productive gas capacity<sup>4</sup> and the growing flexibility requirements for Russian gas.<sup>5</sup>

This comment reviews the impact of the tight market on exports of Russian gas to Europe in 2021 and explores the situation regarding the latest changes in Russia's gas supply and spare productive capacity. This allows us to assess how - if at all - Gazprom has changed its gas export strategy and what lies ahead for the winter of 2021/22.

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<sup>1</sup> See Yermakov V. *Russian Gas: The Year of Living Dangerously – OIES Energy Comment* published in September 2020 for the discussion about the effects of the loose market of 2020 on Russian gas.

<https://www.oxfordenergy.org/publications/russian-gas-the-year-of-living-dangerously/>

<sup>2</sup> Gazprom's press-release of September 1, 2021, states that during January-August of 2021, Russia's exports of pipeline gas "beyond FSU" (this category until recently included Europe and Turkey but in 2021 it will also include about 10 Bcm of expected gas deliveries to China via Power of Siberia) have amounted to 131.3 Bcm, up 21.4 Bcm or 19.4 per cent year-on-year.

<https://www.gazprom.com/press/news/2021/september/article536637/>

<sup>3</sup> By 16 September, European storage was 71 per cent full (73.9 bcm), the lowest on that date as percentage of storage capacity since 2011 when the statistics became widely available. At the same time, in mid-September the TTF front month gas futures for October 2021 exceeded \$26/MMBtu, setting an all-time record.

<sup>4</sup> See Yermakov V. *Shrinking Surplus: The Outlook for Russia's Spare Gas Productive Capacity – OIES Energy Comment*, 2018.

<https://www.oxfordenergy.org/publications/shrinking-surplus-outlook-russias-spare-gas-productive-capacity/>

<sup>5</sup> See Yermakov V. *It Don't Mean a Thing if It Ain't Got That Swing: Why Gas Flexibility Is High on the Agenda for Russia and Europe – OIES Energy Comment*, 2019.

<https://www.oxfordenergy.org/publications/dont-mean-thing-aint-got-swing-gas-flexibility-high-agenda-russia-europe/>

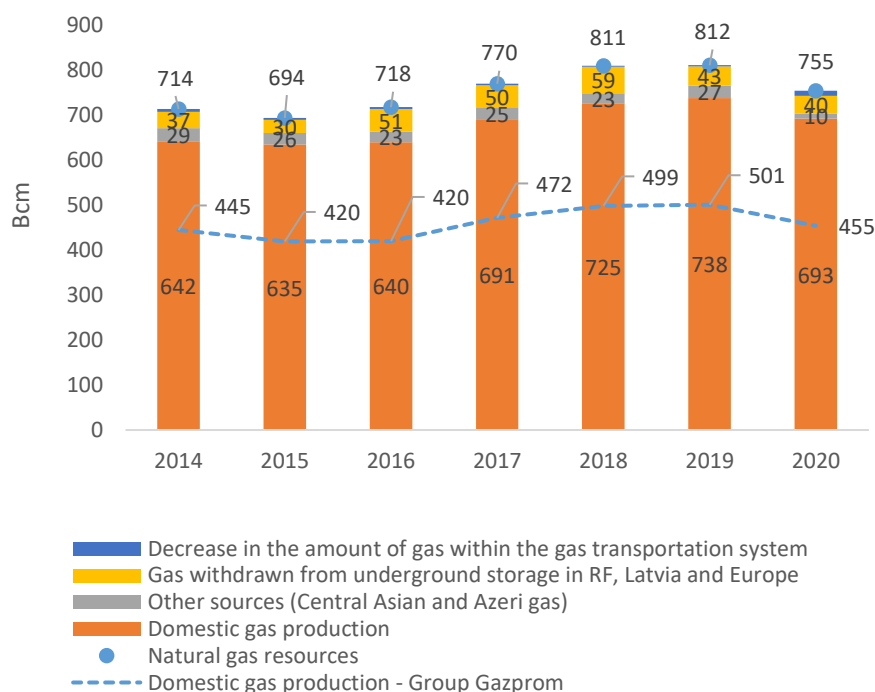
## Under pressure: Russia's gas balance and position in Europe in 2020

Before analyzing the market situation in 2021, it is worth reviewing the overall trends in Russia's gas balance and gas exports over the past few years. This will help to explain the rationale behind the decisions being made by Russia's gas strategists.

Facing falling demand and hence a weak market in 2020, Russia dramatically reduced its gas output. Russia's overall gas production in 2020 declined to 693 Bcm, down 46 Bcm or 6.2 per cent year-on-year. Gazprom ended up having to assume the role of balancing the market, holding back its own gas production to 455 Bcm, 47 Bcm lower year-on-year (a 9.3 per cent decline). It absorbed most of the decline in Russian gas production, while independents<sup>6</sup> and oil companies managed to maintain and even grow output.

Gazprom has traditionally undertaken this balancing role as part of dealing with seasonal swings in demand, using its very flexible, super-giant Cenomanian gas fields. However, the situation in 2020 was quite extreme, requiring immediate 'on the fly' adjustments to the production side of the balance on a scale that could only be managed by Gazprom due to the characteristics of its assets and customer base. Facing low and even negative export margins (during the lowest point of the price cycle in the summer of 2020), Russia also drastically reduced its purchases of Central Asian gas. (See Figure 1)

**Figure 1: Russia's gas balance: supply sources**



Source: OIES, data collected by the author from various Gazprom's public disclosures

On the distribution side, gross domestic gas consumption and gas deliveries to final consumers in 2020 via the unified Gas Transportation System (GTS) declined in 2020 year-on-year by 3.3 and 4.0 per cent respectively but remained at relatively high levels of 428 Bcm and 340 Bcm. Technical gas used by the GTS compressor stations to move volumes through the extended pipeline and gas storage network dropped by 15 per cent to 33 Bcm. Gazprom, facing falling and uncertain demand during 2020,

<sup>6</sup> The term "independents" refers to private Russian gas companies that are neither state-owned nor are Gazprom subsidiaries.

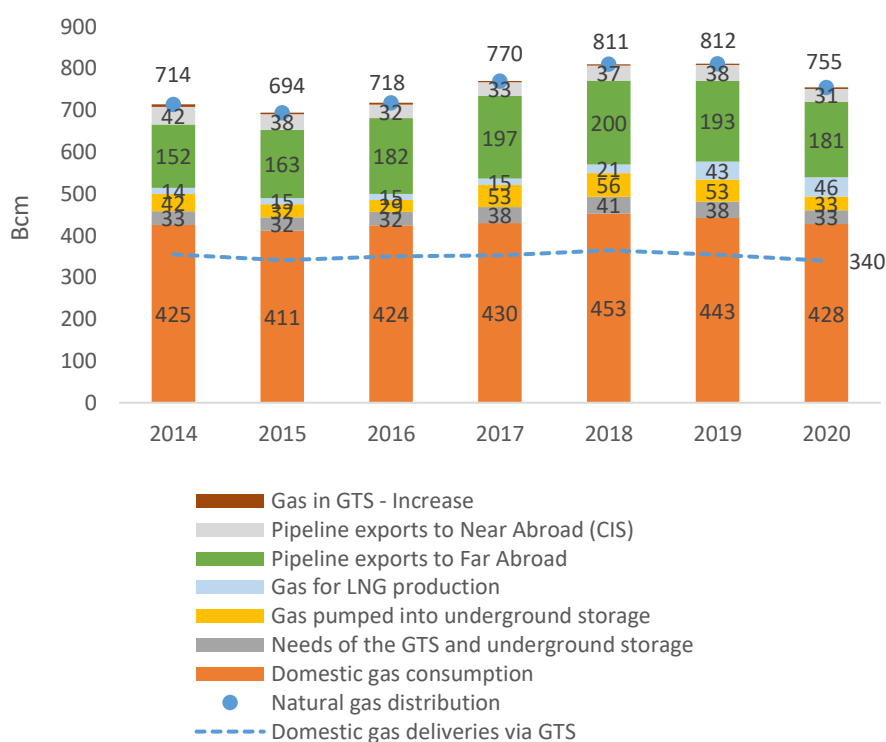


drastically reduced the pumping of gas into its underground gas storage facilities by 20 Bcm, down 38 per cent year-on-year, to 33 Bcm.

Gas volumes delivered to liquefaction plants increased by 2.8 Bcm to 46 Bcm (up 6.5 per cent year-on-year) with Russian LNG plants on Yamal and Sakhalin working at full capacity and even exceeding it. The available statistics on Russia's gas balance do not contain a separate line for exports of LNG, but most of the gas sent to liquefaction facilities was exported, a total of 39.8 Bcm (29.6 million tons), slightly up year-on-year.<sup>7</sup>

Exports of Russian pipeline gas to the so-called 'Far Abroad'<sup>8</sup> in 2020 declined by 11.7 Bcm (or 6 per cent) and amounted to 181.4 Bcm. This number, however, included 4.1 Bcm of Russian gas deliveries to China via the Power of Siberia pipeline that started to ramp up last year. Thus, effectively, Gazprom exports to Europe declined more than to 'Far Abroad', by approximately 8 per cent year-on-year. However, gas exports to CIS countries declined most significantly, by 7 Bcm to 30.7 Bcm (18.6 per cent year-on-year), on account of lower demand in Belarus and Kazakhstan and also because Gazprom stopped accounting for gas deliveries to the separatist eastern regions of Ukraine within the category of 'exports to CIS countries' (In 2019 Gazprom reported gas exports to Ukraine at 2.8 Bcm but Ukraine refused to recognize them as such, reporting zero gas imports from Russia). (See Figure 2)

**Figure 2: Russia's gas balance: distribution**



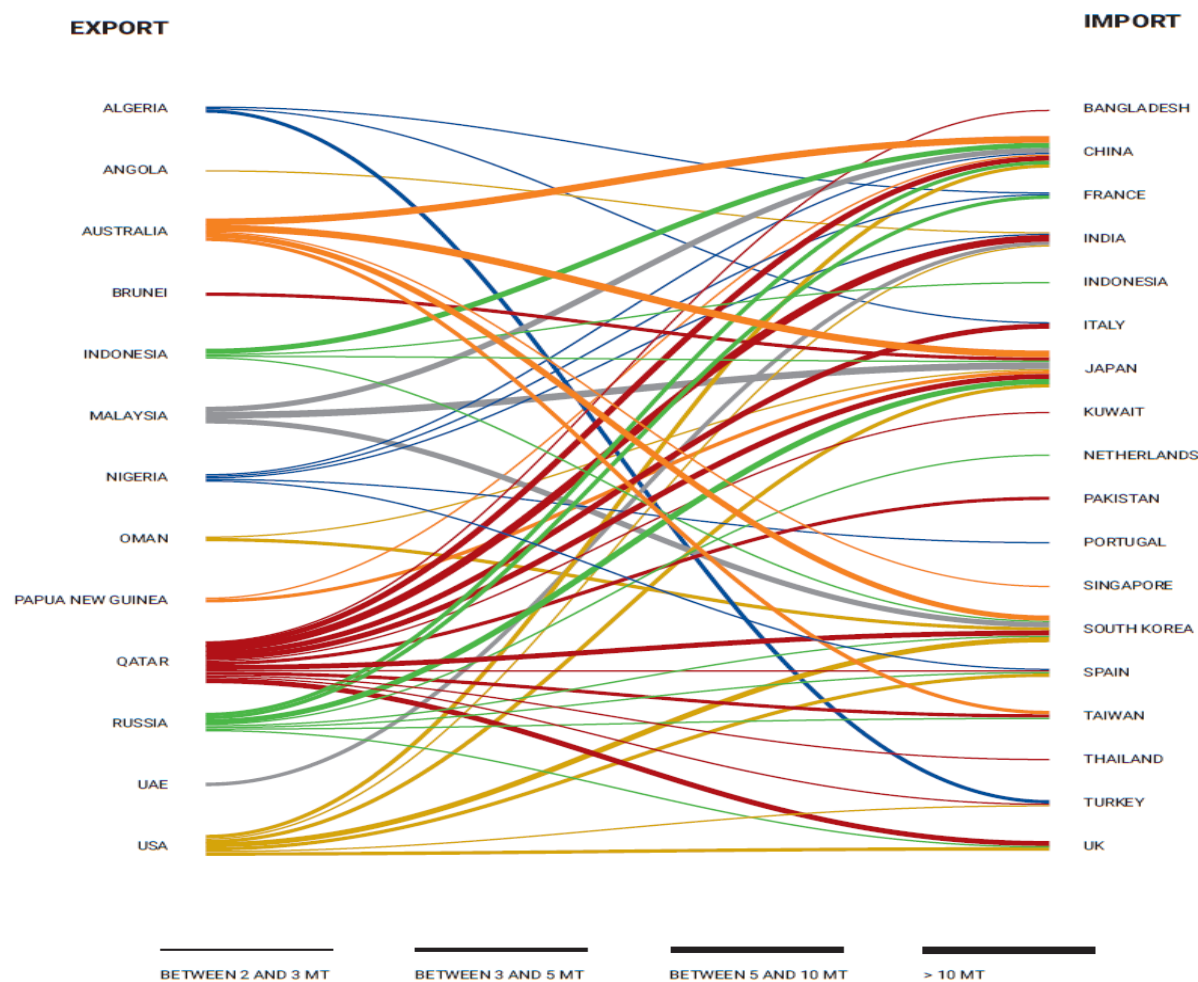
Source: OIES, data collected by the author from various Gazprom's public disclosures

<sup>7</sup> The difference between reported amounts of gas sent for liquefaction and reported LNG exports is apparently due to technological losses and own use.

<sup>88</sup> Gazprom uses the conventional category "Far Abroad" for its exports to the countries outside of the Former Soviet Union. Thus, exports to the Baltic states are excluded from "Far Abroad". The category CIS refers to Commonwealth of Independent States, that is the countries formerly part of the Soviet Union with exception of Ukraine, Georgia, and Turkmenistan.

In addition to being the world's largest pipeline exporter of gas, Russia is now a significant exporter of LNG. In 2020, Russia became one of the 'Big Four' global LNG producers and exporters alongside Australia, Qatar, and the US.<sup>9</sup> Two of Russia's largest operating LNG projects at present are Sakhalin LNG in Russia's Far East in which Gazprom has a majority interest and Novatek's Yamal LNG on the Yamal peninsula in the western part of Russia's Arctic. According to GIIGNL, the distribution of Russian LNG exports in 2020 was skewed in favour of Europe (18.35 million tons) at the expense of Asia (11.25 million tons), due to the disappearance of the usual Asian premium. Sakhalin LNG stayed in Asia but deliveries from Yamal LNG mostly ended up in Europe. (See Figure 3)

**Figure 3: Global LNG imports and exports in 2020 (flows of LNG in million ton)**



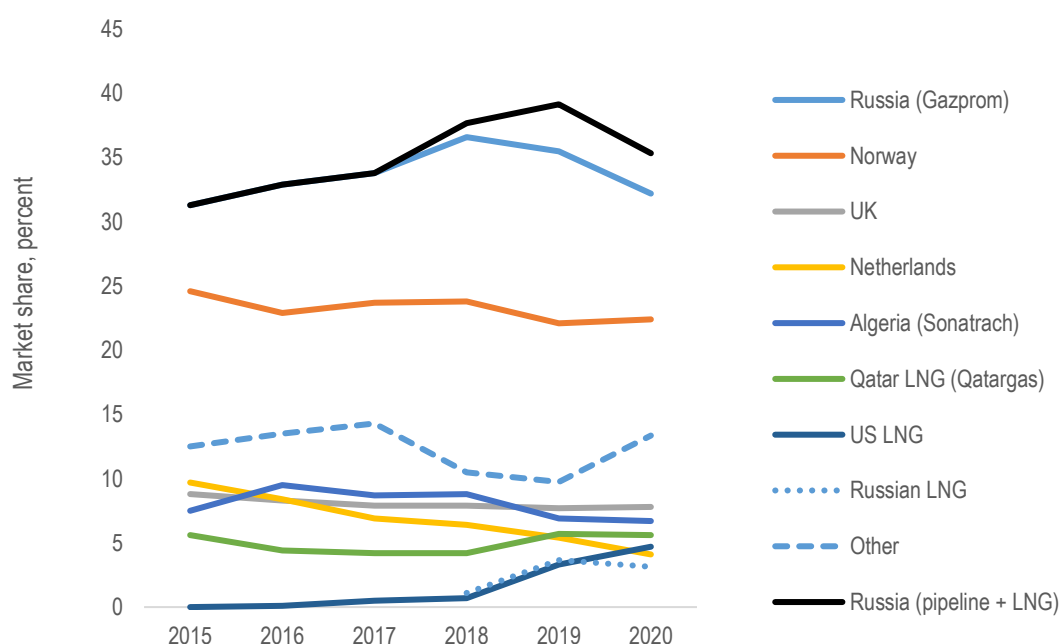
Source: GIIGNL Annual Report, 2021

<sup>9</sup> See the following OIES papers for more information on Russian LNG:  
 Henderson J. and Yermakov V. *Russian LNG: Becoming a Global Force*, OIES Paper, 2019  
<https://www.oxfordenergy.org/publications/russian-lng-becoming-a-global-force/>  
 Yermakov V. and Sharples J. *A Phantom Menace: Is Russian LNG a Threat to Russia's Pipeline Gas in Europe?* OIES Paper, 2021  
<https://www.oxfordenergy.org/publications/a-phantom-menace-is-russian-lng-a-threat-to-russias-pipeline-gas-in-europe/>

Gazprom's pipeline gas exports have traditionally accounted for about one-third of European gas consumption.<sup>10</sup> Gazprom regularly reports the amounts of gas supplied by major sellers to Europe as part of its competition analysis and estimates the corresponding market shares. It is worth noting that for the purposes of this calculation, Gazprom defines gas consumption in the European gas market as comprising EU-27 without the three Baltic states (historically, Lithuania, Latvia, and Estonia are included in the so-called 'Near-Abroad' category in Gazprom's reports) but including the UK, Norway, Switzerland, Serbia, Bosnia and Herzegovina, Macedonia, Albania, and Turkey. Volumes are reported in Russian calorific standard (8850 kilocalories per cubic meter of gas at 20 degrees Centigrade). According to Gazprom's methodology, European gas consumption amounted to 548.6 Bcm in 2018, 560.6 Bcm in 2019, and 539.8 Bcm in 2020, with Gazprom reporting its gas sales to Europe as 200.8 Bcm, 199 Bcm, and 174.9 Bcm respectively (in Russian standard).

Russia's overall competitive position in the European gas market strengthened during 2015-2019 on the back of rising demand and falling indigenous production. (See Figure 4)

**Figure 4: Market shares of main suppliers of natural gas to Europe**



Source: OIES research, data from the market intelligence sections of various Gazprom reports

Russia has also diversified its mode of gas delivery and has become one of the main LNG importers to Europe in the past three years. As shown in Figure 4, Gazprom's share of European gas consumption peaked at 36.6 per cent in 2018, and Russia's overall share (for both pipeline and LNG) reached 39 per cent that year. Russian pipeline gas market share returned to its more 'normal' 32.4 per cent in 2020 as Gazprom had to accommodate the inflow of global LNG during the first half of 2020. At the same time, the shares of other pipeline gas suppliers to Europe have been declining since 2015. Conversely, LNG imports to Europe have been on the rise as the loose global gas market made Europe the destination of last resort for flexible LNG volumes, especially during 2020. It is worth noting that Russian

<sup>10</sup> According to Gazprom's Investor Day 2021 presentation, Gazprom accounted for 32.2 per cent of consumption and 56 per cent of imports in Europe in 2020 (see page 31)

<https://www.gazprom.com/f/posts/23/378358/invest-day-2021-presentation.pdf>

Gazprom's share in 2016-19 is given in the 2020 Investor Day presentation (page 21)

<https://www.gazprom.com/f/posts/64/716836/investor-day-2020-presentation.pdf>

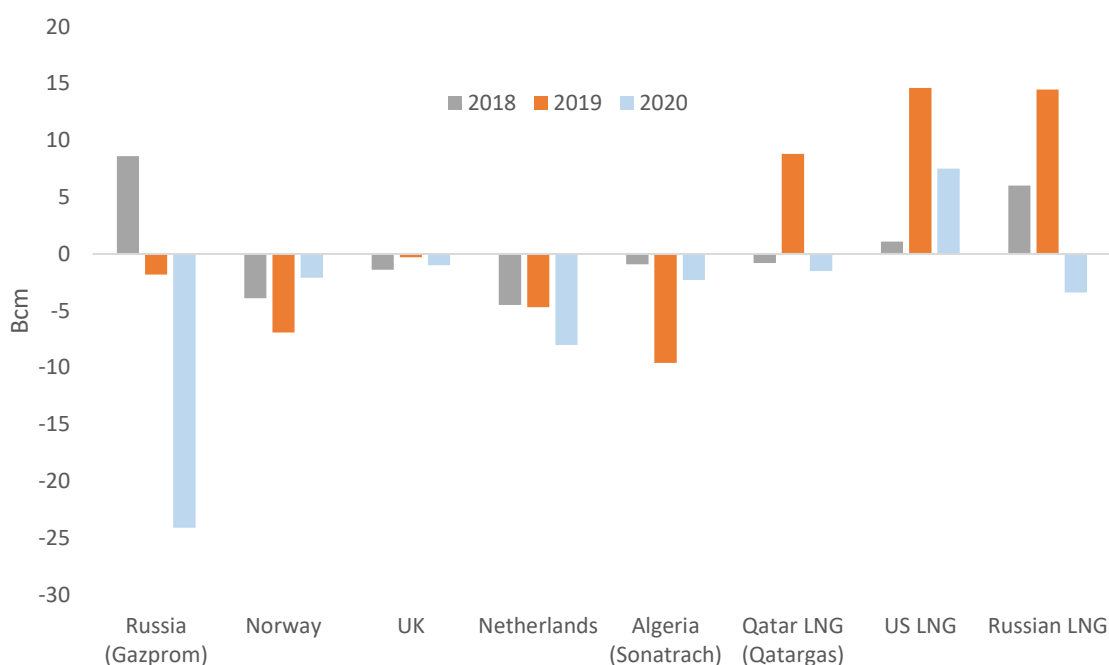
LNG from Yamal was part of this 'rising tide' of LNG deliveries, which helped keep the overall share of Russian gas in Europe (pipeline and LNG combined) at 35.3 per cent in 2020.<sup>11</sup>

## Lessons from the loose gas market of 2020: Gazprom accommodates supply glut in Europe

During 2020 Russia demonstrated that it could assume the role of a short-term market balancer and substantially swing its gas production in response to shifts in demand. But it is important to note that the stress-test was one-sided, as Russia had to deal with a sudden decline in export demand for its gas, not with a sudden demand spike.

The winter of 2019/2020 was one of the warmest on record, reducing the need for gas used for heating in buildings as well as heating-related electricity consumption. The impact of the pandemic and the triple whammy of a warm and windy winter, record European storage levels, and readily available LNG at exceptionally low prices dramatically reduced Europe's call on Russian pipeline gas in 2020. As a result, Gazprom had to accommodate almost all the decline in European gas consumption. (See Figure 5)

**Figure 5: Incremental y-o-y changes in European imports by supplier, 2018-2020**



Source: OIES, data from Gazprom and GIIGNL

It is noteworthy that for the bulk of its European gas exports, Gazprom must meet nominations from its European buyers and is effectively demand-constrained. This stems from one of the key characteristics of Gazprom's long-term contracts: the embedded flexibility in take-or-pay clauses provided by the wide delta between minimum contracted volumes that buyers may nominate and maximum contracted volumes that Gazprom has to supply should buyers make the nominations. Furthermore, if buyers do

<sup>11</sup> The data presented in Figure 4 was reported by Gazprom in its Annual Reports for 2019 and 2020. Its sources include national statistics offices of various countries, Eurostat, and industry consultants. Gazprom converted the data to Russian standards (calorific value of 8,850 kcal/cu m at 20°C). The data on Russian LNG exports was reported by GIIGNL in its Annual Reports.

not take the minimum contracted volumes in any given year, they can pay and take the volumes over the next several years (the so-called 'make-up' gas).<sup>12</sup>

In 2020 the gas glut in Europe emerged even before the full extent of the COVID-19 threat became obvious. The global gas market had been oversupplied for some time due to the emergence of new LNG supply during 2018-2019 from projects which took investment decisions in the mid-2010s. These supply additions entered the market at a time when global demand failed to meet growth expectations.<sup>13</sup> As the COVID-19 lockdowns unfolded during March-April 2020, the existing over-abundance of gas was exacerbated. This resulted in record levels of European gas storage by the beginning of spring 2020 and downward pressure on European hub prices. It is noteworthy that gas in storage by the start of the heating season of 2019/20 was already at high levels. At the end of December 2019, an end-of-year record of 91.5 Bcm – 20 Bcm higher than at the end of 2018 – was registered.<sup>14</sup> This can be partially explained by the fact that fears of 'no deal' over transit with Ukraine at the end of 2019 had incentivized Europeans to purchase Russian gas over and above 'normal' levels and put it in storage; the flip side of this was reduced deliveries at the beginning of 2020 when the transit deal with Ukraine removed the supply risks.<sup>15</sup> This may have impacted the relative balance between Gazprom's sales in 2019 and sales in 2020: higher volumes were 'sold and delivered' in 2019 but not consumed until 2020 than is usually the case, thus making Gazprom's sales in 2019 appear slightly higher and Gazprom's sales in 2020 slightly lower.

Meanwhile, gas prices at the European gas hubs crashed through the \$3/MMBtu level in April 2020 and went below \$2/MMBtu in May. Similarly, spot gas prices in Asia went into a deep dive in the spring and by June prices at all key benchmarks – Henry Hub, TTF, and Asia spot – had converged at sub-\$2/MMBtu levels. The differential between TTF and Henry Hub became negative in summer, closing the transatlantic arbitrage for US LNG. Overall, the gas glut was pressuring suppliers who had been struggling to cover their short-run marginal costs (SRMC) and taking heavy losses with regards to total costs.

In these circumstances, Russian pipeline gas exports to Europe emerged as a key balancing factor, especially during the first half of 2020, when they declined by 18.4 Bcm year-on-year, becoming the main source of accommodation for the growing supplies of LNG that were entering Europe as a market of last resort.

The evidence from 2020 clearly demonstrates that Gazprom refrained from engaging in a price war in a situation of falling demand which it apparently considered painful but transitory. Russia is one of the lowest cost gas suppliers, but even for Gazprom the sub-\$2 gas price in Europe did not cover short-run marginal supply costs (including export tax). Expecting a recovery in demand, Gazprom was patiently acting as a price taker and was optimizing its sales strategy to minimize losses. The dynamics of Gazprom's sales at its Electronic Sales Platform (ESP) provides an instructive example of such adjustment, especially for the period covering the 'worst' of the glut combined with the greatest impact of the pandemic. In Q2-3 2019, Gazprom sold 9.5 bcm on the ESP. In Q2-3 2020, this figure rose to 15.25 bcm. However, in Q2-3 2019, no volumes were sold for delivery in 2020 or further ahead. In Q2-3 2020, 4.7 bcm was sold for delivery in 2021 or 2022. So, in mid-2020, ESP sales for near-term delivery were relatively flat year-on-year, and the only increase was in sales for delivery further into the future.

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<sup>12</sup> In previous years, the take-or-pay level was widely reported as 85 per cent of the ACQ, but there have been reports more recently that for some contracts, the ToP level was reduced further.

<sup>13</sup> OIES Quarterly Gas Review, May 2020

<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2020/05/Quarterly-Gas-Review-Issue-9.pdf>

<sup>14</sup> OIES Quarterly Gas Review, May 2020

<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2020/05/Quarterly-Gas-Review-Issue-9.pdf>, p.16

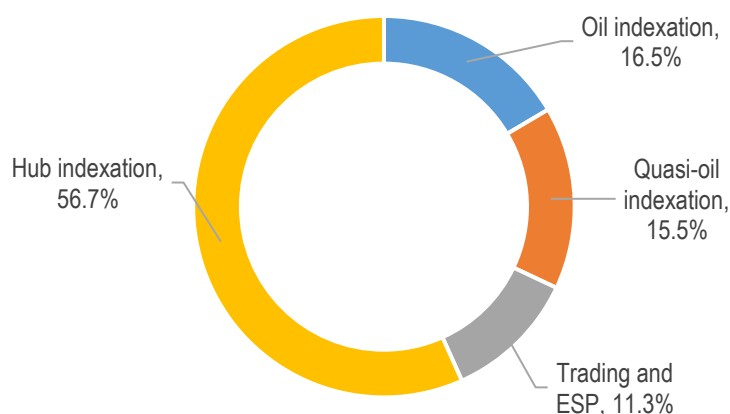
<sup>15</sup> See Pirani S., Sharples J., Yafimava K., Yermakov V. *Implications of the Russia-Ukraine gas transit deal for alternative pipeline routes and the Ukrainian and European markets*. OIES Insight, March 2020

<https://www.oxfordenergy.org/publications/implications-of-the-russia-ukraine-gas-transit-deal-for-alternative-pipeline-routes-and-the-ukrainian-and-european-markets/>



It is also noteworthy that the developments in the European gas market have forced Gazprom to accept gas-on-gas pricing which has taken over from oil indexation in the majority of Gazprom's contracts. Currently, Gazprom sells most of its gas in Europe under long-term contracts with mixed pricing mechanisms,<sup>16</sup> and as a result, Gazprom now has to accept not only the volume risk, but the price risk as well. (See Figure 6)

**Figure 6: Types of pricing mechanism in Gazprom contracts in 2019**



Source: Gazprom

European hubs have been an important clearing mechanism for the LNG market and have been influencing LNG spot prices. Exporters of LNG from Qatar and the US gained market share in Europe in the first half of the year, with US LNG seeing the biggest advances with an incremental increase in deliveries amounting to 9.8 Bcm.

### Big bounce for Gazprom exports in 2021

The gas market pendulum started to swing from abundance to tightness during the spring of 2021 and by the end of the summer had gained such momentum that gas prices started to set new records in Europe almost daily from the beginning of September. After a relatively warm winter of 2020, this year's winter in Europe was colder. Asian markets offered a considerable price premium for LNG, and most of the flexible LNG volumes headed for China and other Asian countries. In Europe, a long cold spring extended the heating season, while the re-opening of business activity increased economic growth. As a result, European gas demand rose robustly, by almost 25 per cent year-on-year in Q2 2021. Meanwhile, indigenous European gas production declined more than 10 per cent year-on-year in the first six months of the year, with Norway, UK, and the Netherlands all producing less gas than in the previous year. This combination of factors resulted in a much higher call on imports and has turned the spotlight onto Gazprom as the largest gas exporter to Europe.<sup>17</sup> (See Figure 7)

<sup>16</sup> <https://www.gazprom.ru/f/posts/64/716836/investor-day-2020-presentation.pdf>

<sup>17</sup> The information presented in Figure 5 has been compiled by Gazprom from various sources, including national statistical agencies and industry consultants and disclosed in Gazprom's presentation to investors on August 31, 2021. <https://www.gazprom.ru/f/posts/57/982072/gazprom-ifs-6mnth2021-presentation.pdf>

**Figure 7: Key market indicators**

**EUROPEAN GAS MARKET HAS CONTINUED ITS GRADUAL REBOUND IN 2Q21...**

	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21
<b>Gas demand in EU</b>	110.1	97.6	163.5	181.5	96.0	98.2	167.2	197.7	119.5
y/y change, %				-4.0%	-12.8%	0.6%	2.2%	8.9%	24.5%
<b>Gas production in EU</b>	58.9	51.8	60.7	60.3	53.2	50.0	55.8	54.4	47.1
y/y change, %				-7.3%	-9.8%	-3.6%	-7.9%	-9.7%	-11.5%
<b>Total gas import in EU</b>	87.2	82.5	101.0	86.1	76.7	78.4	90.8	93.5	89.8
y/y change, %				-4.3%	-12.0%	-5.0%	-10.1%	8.6%	17.1%
<b>LNG import in EU</b>	29.7	24.2	33.0	36.3	31.3	21.6	24.0	27.2	29.5
y/y change, %				27.9%	5.5%	-11.4%	-27.3%	-25.0%	-5.8%
<b>Gas inventories in EU</b>	80.0	105.0	96.7	59.5	87.8	103.9	81.5	32.8	52.3
y/y change, %				34.1%	9.7%	-1.4%	-15.6%	-45.0%	-40.4%
<b>Brent price</b>	68.8	61.9	63.3	50.1	29.6	42.9	44.3	61.1	69.1
y/y change, %				-20.7%	-57.1%	-30.7%	-29.9%	22.0%	133.4%
<b>Average TTF 1-month ahead</b>	168.5	125.0	167.4	130.4	74.4	75.0	161.7	223.2	257.3
y/y change, %				-47.4%	-55.9%	-40.0%	-3.4%	71.2%	245.8%

**...WHILE LNG SUPPLIES TO EUROPE STILL LAG BEHIND THE DEMAND**

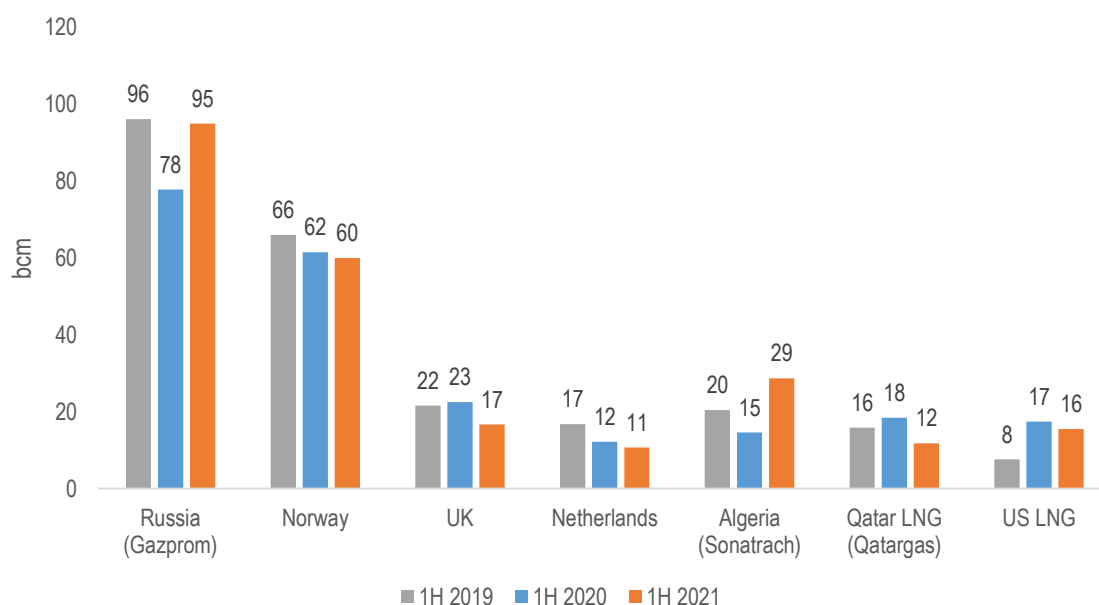
	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21
<b>US LNG import in EU</b>	3.6	2.7	7.9	11.4	6.0	2.4	6.1	7.5	7.8
y/y change, %				181.9%	65.9%	-13.7%	-23.1%	-34.5%	30.0%
<b>Liquefaction capacity utilization in US</b>	77.2%	67.5%	79.6%	89.6%	63.5%	35.5%	76.8%	87.3%	84.1%
y/y change, %				11.4%	-18.9%	-47.3%	-3.5%	-1.9%	32.4%
<b>Oil production in US</b>	12.2	12.2	12.7	13.0	11.6	10.7	10.8	10.8	10.8
y/y change, %				8.3%	-4.9%	-12.3%	-15.1%	-17.1%	-6.9%
<b>Henry Hub gas price</b>	2.6	2.4	2.4	1.9	1.7	2.0	2.5	3.4	2.9
y/y change, %				-34.6%	-33.6%	-16.5%	2.5%	76.6%	70.6%

Sources: Bloomberg, Eurostat, US Department of Energy, IEA, national statistics agencies, ENTSOG, IHS, S&P Platts

Source: Gazprom

Gazprom indeed responded to the call and increased its exports to Europe (including Turkey), almost up to the pre-crisis levels of 2019. Algeria was another supplier which boosted its exports to Europe in 1H 2021. (See Figure 8)

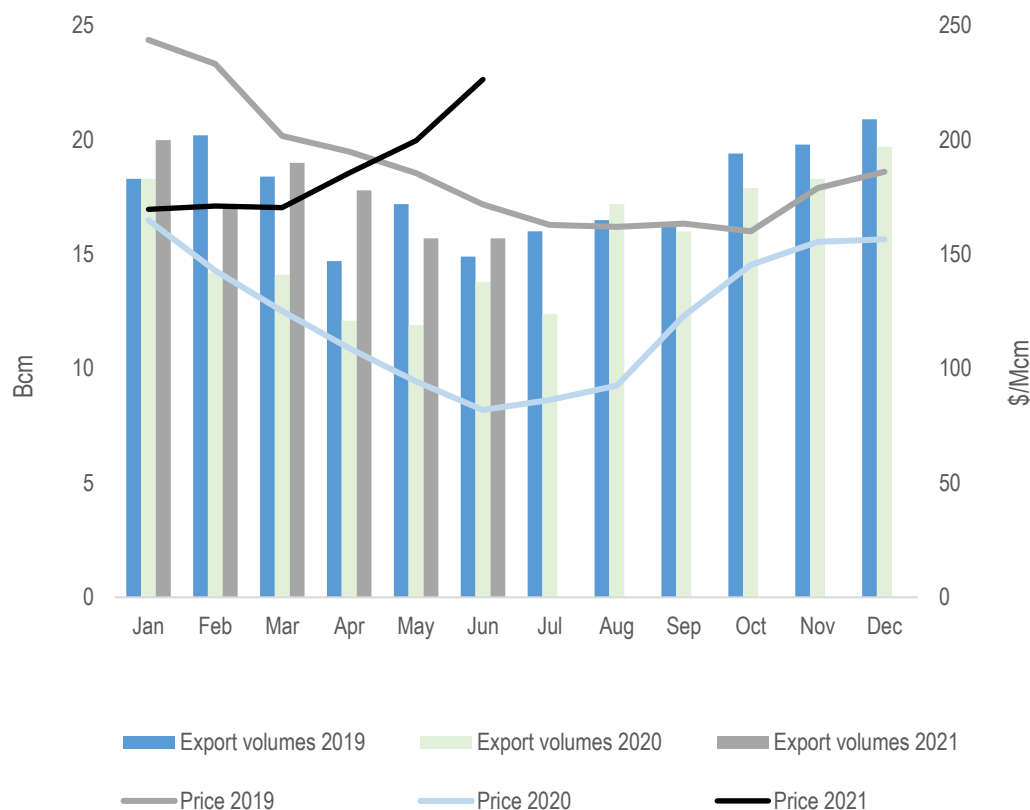
**Figure 8: Main gas suppliers to Europe in 1H of 2019, 2020, and 2021**



Source: OIES research, data from the market intelligence sections of various Gazprom reports

Russia's national customs statistics, one of the few remaining sources of publicly available information about Russian aggregated natural gas exports, are presently available through June 2021. They contain the aggregate numbers for volumes and value (and, therefore, the effective average sales price) of total Russian gas exports to 'Far Abroad' (primarily Europe, since Russian pipeline gas deliveries to China only started in 2020 and are expected to account for about 5 per cent of the total in 2021) and to CIS countries.<sup>18</sup> (See Figure 9)

**Figure 9: Russian exports of pipeline natural gas: volume and price dynamics, 2019-2020**



Source: OIES, data from Russia's Customs Service

As can be seen in Figure 9, both the volume and price of Russian gas bounced back strongly in the first half of 2021, and we are now seeing gas prices reaching record highs in Europe in Q3 2021.

The reported statistics on Gazprom exports to Europe by country in the first half of the year in 2019-21 are presented in Table 1.

<sup>18</sup> As stated earlier, Russia's customs statistics provide the average price for total Russian pipeline gas exports, to both 'Far Abroad', and the CIS countries. Among the latter category, Belarus has been the largest importer of Russian gas by far, accounting for about 10 per cent of total pipeline exports. The price of Russian gas for Belarus has been fixed at \$127/Mcm in 2020 and the same price was agreed for 2021.

**Table 1. Russian pipeline gas exports by country, 1H 2019-21 (Bcm)**

	1H 2019	1H 2020	1H 2021	Incremental Change, 2021/2020 Bcm	Percentage Change, 2021/2020
<b>Western Europe and Turkey</b>	<b>75.3</b>	<b>60.1</b>	<b>77.2</b>	<b>17.1</b>	<b>29%</b>
Germany	27.0	20.1	28.9	8.7	43%
Italy	11.7	10.0	11.4	1.4	14%
Turkey	8.1	4.7	14.6	9.9	209%
France	6.5	5.7	6.6	0.9	15%
Finland	1.4	0.8	1.0	0.3	36%
Austria	7.4	6.6	5.4	-1.2	-18%
Greece	1.5	1.3	1.6	0.3	24%
Netherlands	3.7	5.6	4.2	-1.4	-25%
Switzerland	0.1	0.1	0.2	0.1	62%
Denmark	0.7	0.8	1.0	0.1	18%
UK	6.1	3.0	1.7	-1.3	-42%
Belgium	1.1	1.3	0.6	-0.7	-51%
<b>Central Europe</b>	<b>20.9</b>	<b>17.7</b>	<b>17.8</b>	<b>0.1</b>	<b>0%</b>
Hungary	5.3	3.7	3.9	0.2	5%
Poland	4.3	4.4	5.2	0.8	19%
Slovakia	2.4	3.8	2.5	-1.3	-35%
Czechia	4.2	2.6	0.9	-1.7	-64%
Romania	0.5	0.3	1.2	0.9	264%
Bulgaria	1.4	1.0	1.5	0.4	43%
Serbia	1.0	0.5	1.2	0.7	134%
Slovenia	0.1	0.1	0.3	0.2	110%
Bosnia & Herzegovina	0.1	0.1	0.1	0.0	12%
Macedonia	0.1	0.1	0.0	-0.1	-62%
Croatia	1.4	1.0	0.8	-0.1	-13%
<b>Near Abroad</b>	<b>17.5</b>	<b>14.7</b>	<b>16.1</b>	<b>1.4</b>	<b>9%</b>
Ukraine	1.5	0.0	0.0	0.0	n/a
Belarus	10.1	9.1	10.1	1.0	11%
Moldova	1.5	1.5	1.7	0.2	13%
Lithuania	0.7	0.3	0.3	0.0	12%
Latvia	0.6	0.7	1.0	0.3	50%
Estonia	0.2	0.2	0.0	-0.1	-76%
Kazakhstan	1.6	1.7	1.5	-0.2	-10%
South Ossetia	0.0	0.0	0.0	0.0	0%
Armenia	1.0	1.1	1.2	0.1	10%
Georgia	0.1	0.1	0.0	-0.1	-95%
Kirgyzstan	0.1	0.2	0.2	0.0	20%
<b>Pipe to China</b>	<b>0.0</b>	<b>1.6</b>	<b>4.6</b>	<b>3.0</b>	<b>194%</b>
<b>Total</b>	<b>113.7</b>	<b>94.1</b>	<b>115.7</b>	<b>21.6</b>	<b>23%</b>

Source: OIES, data from Gazprom



Exports to the three largest purchasers of Gazprom gas in Western Europe were up in the first six months of 2021 compared with the same period of 2020: an increase of 8.7 Bcm in Germany (up 43 per cent), up 1.4 Bcm in Italy (up 14 per cent), and an increase of 9.9 Bcm in Turkey (up 209 per cent). Total exports to Western Europe and Turkey grew to 77.2 Bcm, up 17.1 Bcm or 29 per cent year-on-year. This was, in fact, higher than in the pre-crisis first half of 2019.

Gazprom's exports to Central Europe did not change fundamentally year-on-year. This reflected the reduction of ship-or-pay transit volumes via Ukraine from 65 Bcm per annum in 2020 to 40 Bcm per annum since 2021 in accordance with the transit deal. Lower volume commitments via Ukraine in 2021-2024 are due to the fact that the start of Turk Stream allowed Gazprom to replace deliveries to western Turkey via the Trans Balkans pipeline (transiting Ukraine) with direct deliveries. Gazprom also started to supply Bulgaria via Turk Stream instead of via Ukraine. In the future it intends to switch more countries in Central Europe (Serbia and Hungary in particular) to deliveries via Turk Stream.

In the near abroad, Belarus increased its gas purchases by 1.0 Bcm in the first six months of 2021 (up 11 per cent year-on-year). Gazprom continues to report zero exports to the Donetsk and Lugansk regions in Ukraine this year compared with 1.5 Bcm reported in the first six months of 2019.

Russian pipeline gas exports to China continued to ramp up according to plan and are set to amount to 10 Bcm for the full year of 2021.

But the 'Big Bounce' in Gazprom's exports to Europe in 2021 has been due to the dynamics in two markets: Germany and Turkey. How to explain this? One part of the explanation for the strong bounce back has a lot to do with scale and the price optimization strategies of the buyers. Gazprom's supplies to Germany fell by 25 per cent year-on-year in H1 2020, representing the largest incremental decline in Gazprom's export deliveries portfolio. This swing down of demand was very much the result of warm weather and over-abundance of LNG at rapidly declining prices that gave the holders of Gazprom contracts in Germany an opportunity to optimize their portfolios by reducing the share of more expensive Gazprom gas to the minimum contract volumes (sales to Germany are based on gas-indexed formulae that contain a time lag to spot prices) and replacing it with cheaper spot LNG.

In Turkey this effect was greatly exaggerated by oil-indexation and a six-month time lag between oil-indexed prices in the formula and the spot gas price. Gas buyers in Turkey knew well in advance the price trajectory of the gas that they might acquire from Gazprom: in the beginning of 2020 it was still based on relatively high pre-pandemic oil prices in the middle of 2019, but the price was set to decline dramatically by the end of 2020/beginning of 2021 to reflect the extremely low oil prices in spring/summer of 2020.

As a result, the rational behavior of buyers in Germany and Turkey was to lower their nominations under contracts with Gazprom in the first half of 2020 to the bare minimum and to shift their take-or-pay obligations forward in time into the second half of 2020 and 2021.

## New configuration of Gazprom export flows

Yet another explanation for the 'Big Bounce' has to do with the changing configuration of Russia's gas export pipelines and gas flows. The data in the previous section shows that Gazprom responded to higher contractual nominations by its counterparties during H1 2021 with an almost 30 per cent increase in its overall exports to Western Europe and Turkey, with the bulk of the increase occurring in just two markets: Turkey and Germany. It is no coincidence that both these countries are connected with Russian gas supplies by direct undersea pipelines: Blue Stream and Turk Stream in the case of Turkey, and Nord Stream 1 in the case of Germany.

According to the transit deal between Gazprom and Naftogaz of Ukraine signed at the end of 2019, Gazprom agreed that it would pay Naftogaz for transit of 65 Bcm in 2020 and for 40 Bcm each year during 2021-2024. These payments do not depend on the actual gas flows via Ukraine, as the deal is essentially ship-or-pay. At the same time, Gazprom launched its new 31.5 Bcm Turk Stream pipeline in January 2020. The physical construction of Nord Stream 2 was completed in September 2021, and

Gazprom is awaiting a decision from the German regulator, BNetzA, on the terms of its use. Without the continuation of robust gas demand growth in Europe in the next few years, Gazprom will have to make two important choices regarding its emerging export pipeline capacity surplus: first, which export routes to load up to their maximum capacity and which to leave underutilized, and second, which routes to use for covering seasonal flexibility needs and during the maintenance of the undersea pipelines.

It would be logical to expect that Gazprom's top priorities for maximum load are going to be new direct pipelines from Russia to its target markets: Nord Stream, leading to Northwest Europe, and Turk Stream, leading to Western Turkey and on to Southeast Europe. The reasons are as follows: primarily, Gazprom prioritizes shipments via the routes that avoid third-country transit risk. But another major consideration is economics: the payments for the cost of transportation via Nord Stream and Turk Stream to the Gazprom subsidiaries that run these pipelines are mere transfers within the overall Gazprom corporate structure, and preferable to the transit fees that Gazprom has to pay to transit countries.

Besides, the reduction in the overall transportation distance from the designated source of supply in Russia to the target market in Europe compared with the alternatives results in reduced transportation costs and improves Gazprom's export margin. Additionally, new, state-of-the-art pipelines allow higher operating pressures and require less maintenance and repair, which also improves the economics of the direct routes.

Indeed, Nord Stream 1 utilization amounted to 58.7 Bcm, 58.5 Bcm, and 59.3 Bcm in 2018, 2019, and 2020 respectively (exceeding the nameplate capacity of the pipeline by 6-8 per cent). This was helped by the start of the EUGAL pipeline that allowed Gazprom to overcome the regulatory restrictions imposed on the full use of the OPAL pipeline. The start of flows via Nord Stream 2 is going to bring the issues of regulatory restrictions on the use of the full capacity of the Russian gas pipeline back to centre stage.

Russian gas exports via Turk Stream amounted to 13.5 Bcm in 2020 (43 per cent utilization of 31.5 Bcm combined capacity of the two strings). It is expected to ramp up utilization with the redirection of deliveries to Serbia and Hungary away from the Ukrainian route when the pipeline connections to these countries become fully operational.

For volumes going into Nord Stream, the argument about a shorter travel route and lower delivery costs for gas from Yamal is quite obvious. This argument is less apparent for Russian gas that is delivered to Central Europe transiting Turkey via Turk Stream and to Turkey for its own consumption via Turk Stream and Blue Stream. But it is important to realize that Gazprom uses the principle of substitution, optimizing transportation distances geographically with regards to the source of supply and temporally with regards to demand seasonality: a significant share of gas that flows to Turkey originates not in Western Siberia but from the gas fields located in Russia's lower Volga and Southern regions. To add to this pool of available gas resources, Russian oil companies produce associated gas in Russia's south from their oil fields. Besides, Russia imports gas from Central Asia and re-exports it. The transportation distances for these sources of gas to the target markets are significantly lower than for gas from Western Siberia.

It is worth noting that gas deliveries to domestic users in Russia's southern regions exceed the volumes from the supply sources listed above (especially after the significant reduction of imports from Central Asia in 2020) on an annual basis. But demand in Russia's southern regions is very seasonal, reflecting the larger proportion of residential users and a lower share of industrial users. As a result, Gazprom is actively using withdrawals from gas storage (Russia's largest gas storage facility, Severo-Stavropolskoye is in the south) to meet peak export and domestic demand requirements in winter and refills the storage by delivering gas from Western Siberia during the summer trough when domestic demand is lowest.

With regards to the third-country transit routes (via Ukraine and Poland), prior to 2020 it was Ukraine that had underutilized capacity and was the prime provider of flexibility for Gazprom's flows to Europe.

In 2018 Gazprom transited 86.8 Bcm via Ukraine, an amount estimated to be equal to about 65 per cent of Ukraine's available transit capacity to Europe that year. In 2019 Russian gas transit through Ukraine rose by 3 per cent, to 89.2 Bcm. It is noteworthy that Gazprom only had to pay for the actual transited volumes under the terms of its previous contract with Naftogaz.

The new deal with Ukraine, however, is different. According to the agreement, the ship-or-pay terms are not flexible, with the annual booked capacity of 65 Bcm in 2020 and 40 Bcm in 2021-2024 being spread by way of equal daily bookings – 178.1 mmcm/d in 2020 and 109.6 mmcm/d in 2021-2024. Ukraine, thus, has managed to secure transit revenue irrespective of actual flows of Russian gas via its system through the end of 2024. The transit fee via Ukraine is significantly higher than for Nord Stream and Yamal-Europe on a unit per km basis, making any additional bookings of transit capacity via Ukraine (over and above the pre-paid ship-or-pay volumes) the least attractive option economically for Gazprom. As a result, transit flows via Ukraine declined sharply, to 55.8 Bcm in 2020. They are expected to decline further this year to just around the pre-paid 40 Bcm.

The dynamics during 2021 have been as follows: daily average transit flows via Ukraine (excluding deliveries to Moldova) have been 107.3 mmcm/d from 1 January to 31 August, equating to an annual equivalent of 39.2 bcm. Aside from January 2021 (when Gazprom booked around 41.6 mmcm/d of extra capacity), Gazprom booked 15 mmcm/d of firm monthly capacity via Ukraine – the exact amount offered by GTSOU, the Ukrainian gas pipeline operator. This was also the maximum amount covered by the Russia-Ukraine interconnection agreement on the Russia-Ukraine border.<sup>19</sup>

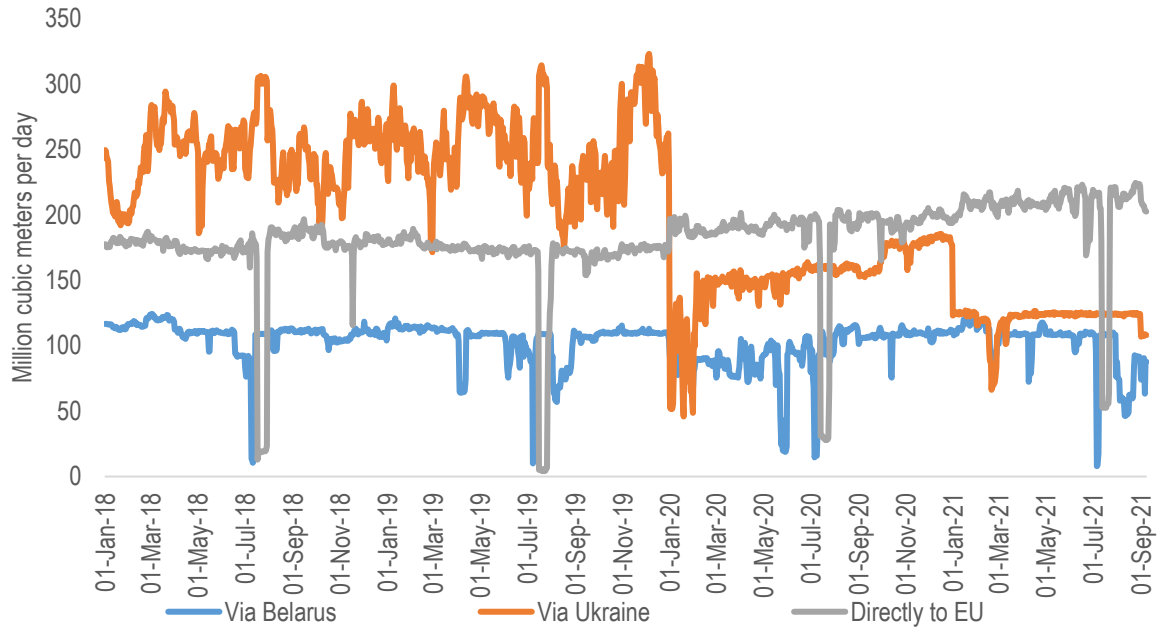
The switch to the ship-or-pay arrangement with Ukraine has made the Yamal-Europe pipeline the balancing transit route for Gazprom for the near term, and a potential source of additional flexibility for Europe. At the same time, this route via Poland remains very exposed to the risk of lower utilization on an annual basis if European demand for Russian gas declines, and also at risk of uneven utilization throughout the year due to demand seasonality. Additionally, after the expiration of the Ukraine transit deal at the end of 2024, Poland and Ukraine might end up competing against each other to secure the incremental Russian transit volumes. This also explains the opposition of both countries to Nord Stream 2 and their attempt to limit its utilization.

To summarize, the impact of the new configuration of Gazprom's export flows to Europe has been as follows: direct flows to the EU have been growing (save for short maintenance periods in summer), the Ukraine transit profile in 2021 was essentially flat, and transit via Yamal-Europe (Belarus and Poland) has become a balancing route. The data provided by Gazprom for its exports to the EU does not include gas flows to Turkey via Blue Stream and Turk Stream and this helps explain the seeming contradiction between the lower total flows to the EU in the chart and rising levels of Gazprom exports to Europe (including Turkey) reported by Gazpromexport. Most of the decline in Ukrainian transit which related to deliveries to South Europe and the Balkans has been compensated by Russian gas transit to these countries via Turkey by way of direct pipelines under the Black Sea. (See Figure 10)

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<sup>19</sup> The results of the capacity auctions relating to Ukrainian transit are available here: <https://ipnew.rbp.eu/rbp.eu/#capacityauctions>

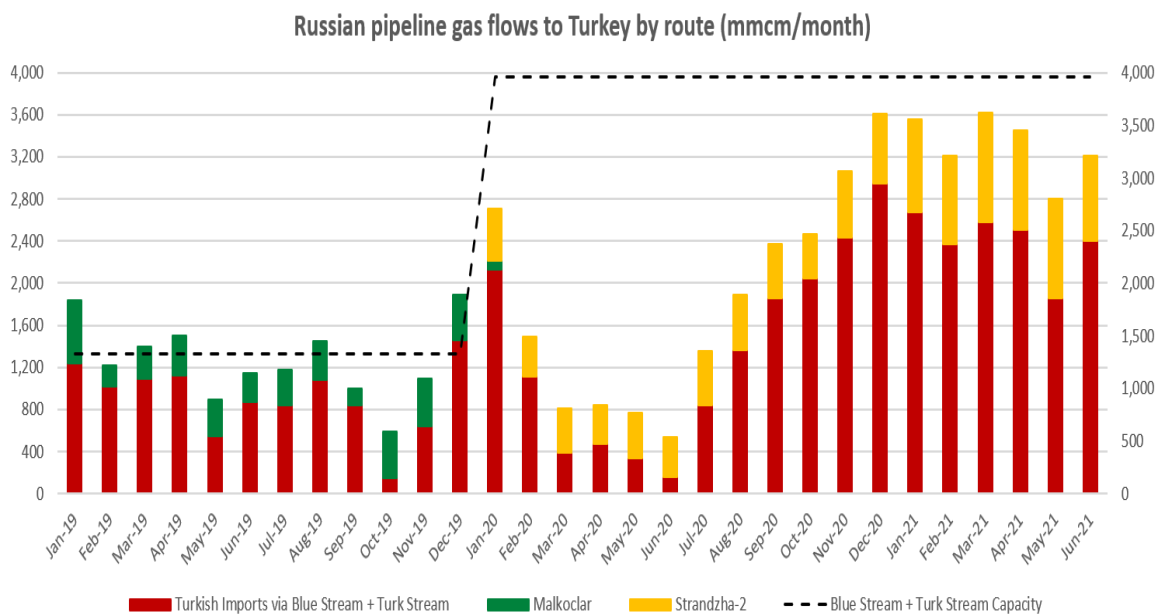
**Figure 10: Gazprom pipeline gas deliveries to the EU via main routes**



Source: OIES, data from Gazprom

The analysis conducted by my OIES colleague Jack Sharples on Russian gas flows via Turkey based on reported statistics by the Turkish Energy Market Regulatory Authority (EMRA) demonstrates a robust ramp-up of Russian gas flows to Turkey since summer 2020. This is partly the result of a higher call on Russian gas by Gazprom’s Turkish buyers due to the favourable oil-indexed pricing in 2021 and partly the consequence of Turkish demand recovery. However, it is also due to the redirection of the gas flows that were arriving to Turkey and Southern Europe via the Trans Balkans pipeline in favour of the newly constructed Turk Stream. (See Figure 11)

**Figure 11: Russian gas flows to/via Turkey**



Source: OIES research

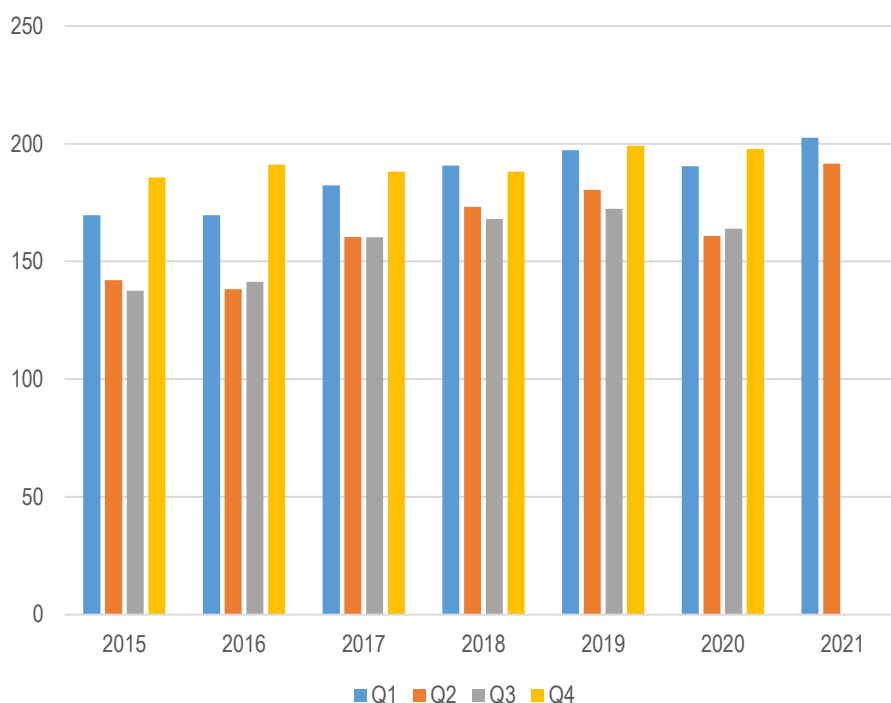


## Higher call on Gazprom gas in Europe tests Russia's spare productive capacity

An obvious, but often forgotten, characteristic of a swing supplier is that the ability to constrain and then quickly revive production to the levels of pre-crisis demand is different from the ability to increase it beyond a previously achieved record level.

Russian gas output in 2021 not only returned to its previous highs but has exceeded them, especially in Q2 2021. (See Figure 12)

**Figure 12: Russia's gas output by quarter, 2015-2021 (Bcm)**



Source: OIES research

Specifically, Russian gas production totaled 377 bcm in 1H 2019, fell to 351 bcm in 1H 2020, and rebounded to 394 bcm in 1H 2021. In 1H 2021, Russian gas output was 17 bcm (4.5 per cent) higher than in the pre-crisis (1H 2019). This is substantial, but the real manifestation of the 'bounce' has been its ability to drop production down by 26 Bcm y-o-y in 1H 2020 compared with 1H 2019 and then ramp it back up by 43 bcm in 1H 2021 compared with 1H 2020.

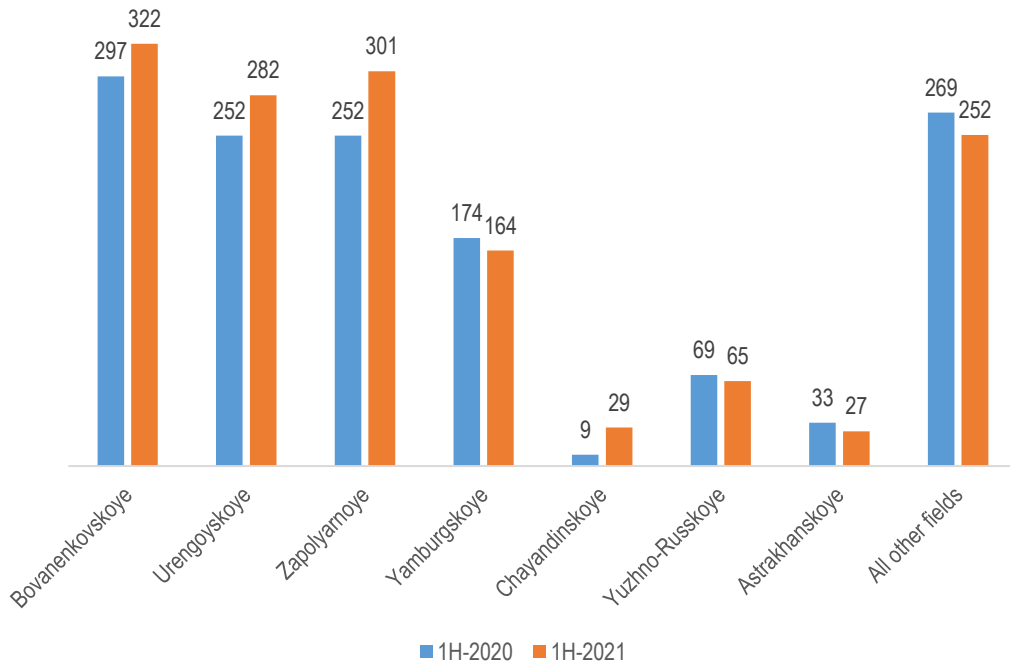
With faster-than-expected European gas market rebalancing and tightening in 2021, the question is: has the call on Russian gas exceeded available productive capacity in the near term?

We discussed the issues of spare Russian gas productive capacity in our earlier research.<sup>20</sup> The data on Gazprom production by its main fields suggests that Gazprom raised its output to record daily levels at fields that had spare productive capacity in the past and has not had near-term spare capacity left during 2021. (See Figure 13)

<sup>20</sup> See Yermakov V. *Shrinking Surplus: The Outlook for Russia's Spare Gas Productive Capacity – OIES Energy Comment*, 2018.

<https://www.oxfordenergy.org/publications/shrinking-surplus-outlook-russias-spare-gas-productive-capacity/>

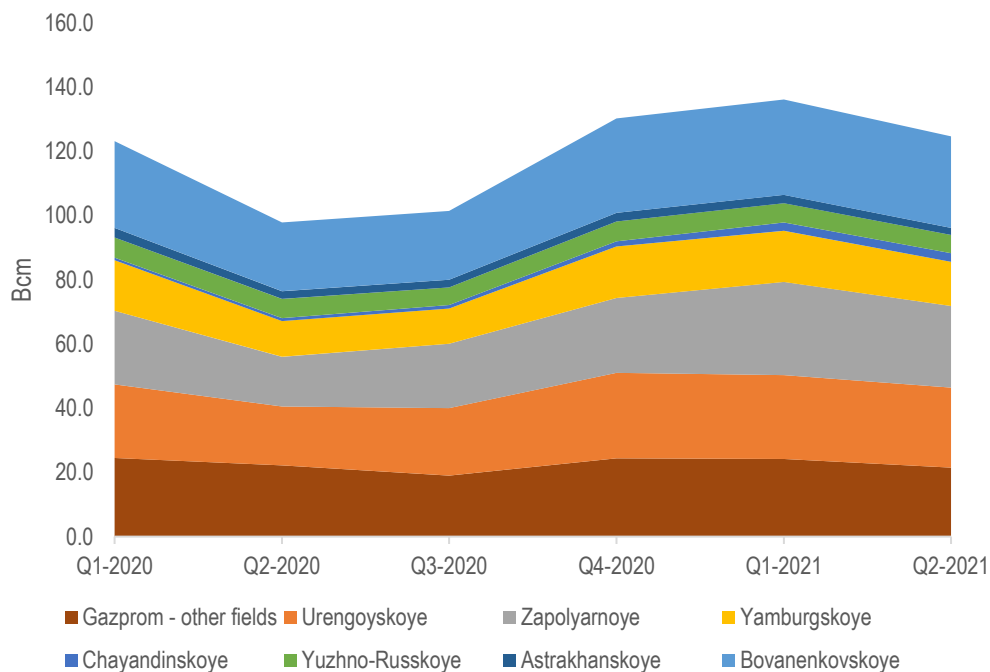
**Figure 13: Gazprom daily gas production by main fields in 1H 2021/2020 (million m3 per day)**



Source: OIES research, data from Gazprom

Furthermore, in Q2 2021 the usual seasonal decline in output was not seen (compared to a very pronounced fall during 2020 which mostly accounted for the lower annual production that year). During Q2 2021 Gazprom was continuing to 'fire on all cylinders' in an attempt to satisfy the growing demand at home and abroad. (See Figure 14)

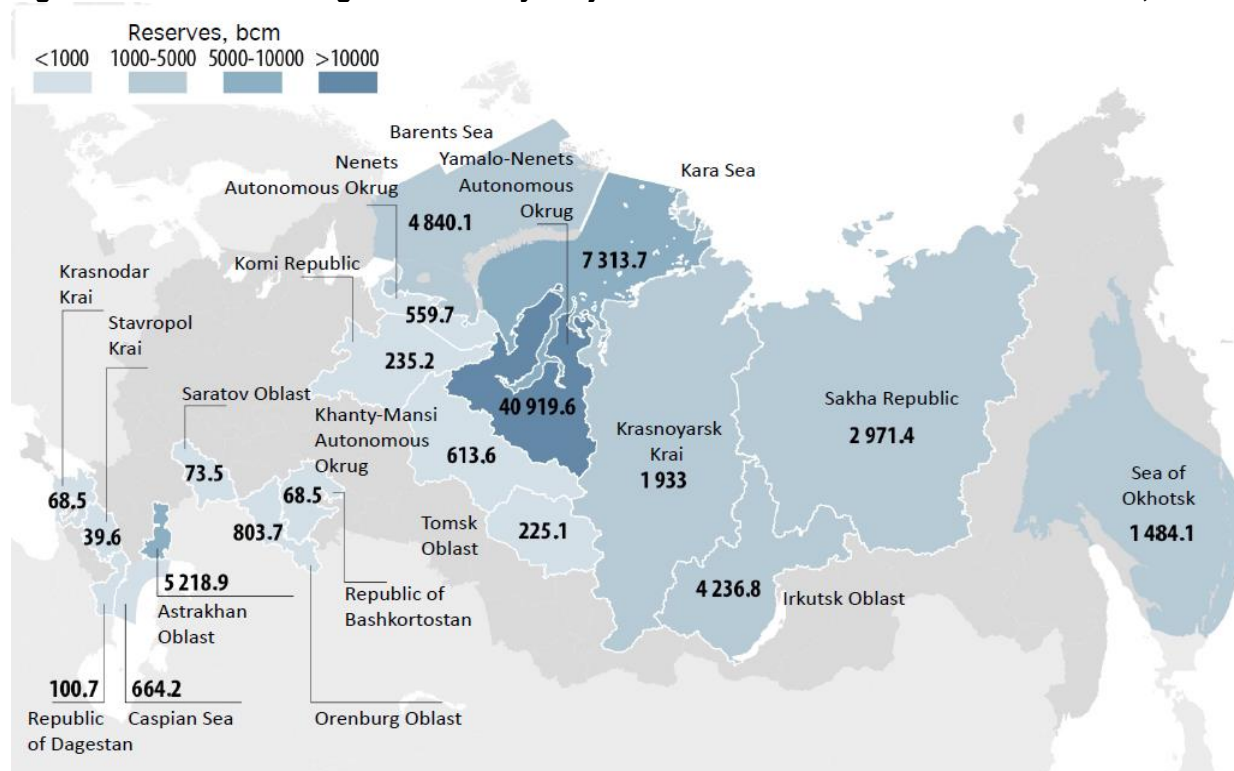
**Figure 14: Seasonal swing in Gazprom's natural gas production from main fields in 2020-21**



Source: OIES research, data from Gazprom

While Russia (and Gazprom) is not running out of natural gas - in fact, Gazprom's CEO Alexey Miller stated on September 17 that its reserves are estimated to cover about 100 years of demand at current levels<sup>21</sup> - the geography of supplies is changing. (See Figure 15)

**Figure 15: Proved natural gas reserves by subject of Russian Federation as of 31 Dec 2019, Bcm**



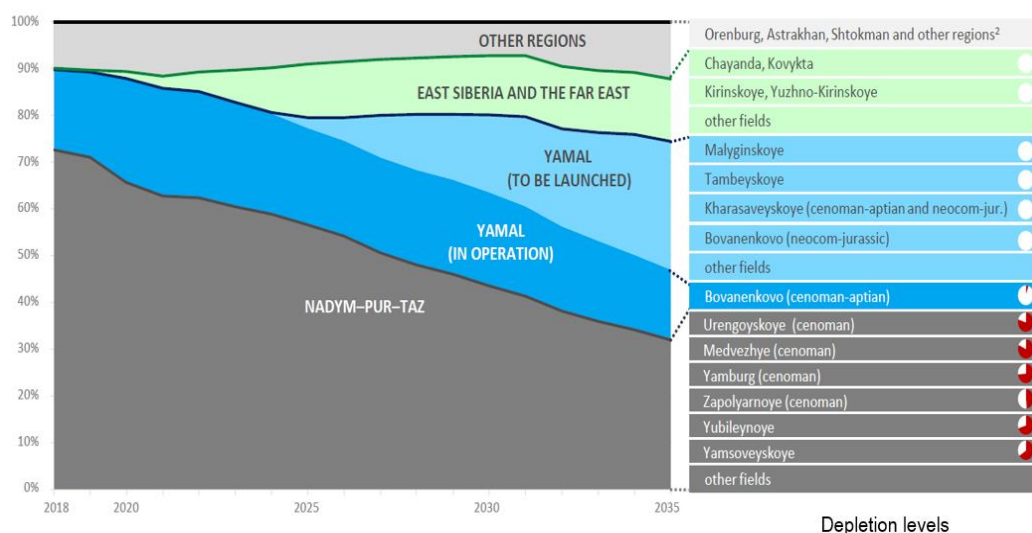
Source: OIES, data from Russia's Ministry of Natural Resources

For almost forty years, Russia's gas output has been supported by the Soviet legacy of super-giant Cenomanian gas fields in the Nadym-Pur-Taz (NPT) region in Western Siberia, but these fields are now in irreversible decline. Gazprom has been trying to manage the output decline by developing wet gas from deeper layers of the NPT super-giants, initially from Valanginian, and recently from Achimov deposits, but this can only slow the natural decline of the NPT production, not reverse it.

In order to meet demand, Gazprom has been developing a new gas province on the Yamal peninsula in the Russian Arctic since the early 2010s, where the Bovanenkovskoye field, the first in a series of the new super-giants, produced 99 Bcm of gas in 2020. According to Gazprom's strategy, new gas from Yamal will eventually replace the declining volumes from NPT in the balance. These investments into bringing additional productive capacities on Yamal onstream in addition to Bovanenkovskoye area, however, predicated on Gazprom's ability to send this gas to the European market via the shortest route through the so-called northern corridor of Russia's transportation system and on to the Nord Stream pipelines. Another part of Gazprom's production strategy has been the development of gas fields in Eastern Siberia to supply gas to China via the Power of Siberia pipeline with the possibility of increasing contract deliveries on this route but also from Sakhalin by a spur to China from the Sakhalin-Khabarovsk-Vladivostok line. But a real game changer may be a new planned pipeline to China from Western Siberia via Mongolia that could for the first time create an alternative to supplies to Europe for Russian gas in Western Siberia. (See Figure 16)

<sup>21</sup> <https://www.gazprom.ru/press/news/2021/september/article537844/>

**Figure 16: Gazprom production strategy to 2035**



Source: Gazprom

The ‘tectonic’ shift in Gazprom’s output - from NPT to Yamal - has important implications for the future of the gas pipeline infrastructure that delivers Russian gas to Europe. Gazprom is the owner and operator of the Unified Gas System (UGS), an extensive network of high-pressure, large-diameter trunk gas pipelines connecting the main production areas in northern West Siberia with domestic consuming regions in the European part of Russia and extending west to export markets in Europe and the CIS countries.

UGS comprises three main transportation corridors: the Central, the Northern, and the Southern. The Central and Southern corridors carry natural gas from the legacy gas fields in the NPT region that have been producing since Soviet times (some started their production in the early 1970s).

The Northern corridor currently sources most of its supply from a new gas province on the Yamal peninsula. The new Bovanenkovo-Ukhta and Ukhta-Torzhok pipelines, completed in 2018 with a capacity of 115 Bcm per annum, were built to evacuate new gas from the super-giant Bovanenkovskoye field and to bring it to Russia’s northwest and on to Germany via Nord Stream 1 and (in the future) via Nord Stream 2. This route is a new shortcut from Yamal to Europe, providing Gazprom with significant cost savings owing to the reduced transportation distance to the target market.

Gazprom’s ability to change the flows and redirect gas from the Northern corridor to the Central corridor in order to increase gas exports via Ukraine is non-existent during the winter peak (when all available pipeline capacity is fully utilized) and limited and unfeasible during the summer (due to much higher transportation costs in Russia and abroad for this route). Gazprom has already announced that it will be decommissioning the older pipelines in the Central corridor in line with the reduction of flows from NPT caused by production declines there. Some of these pipelines have been in operation for over forty years and have passed the limits of their economic life, imposing high repair and maintenance costs on Gazprom.

This means that the capacity of Russian pipelines leading towards the Ukrainian transit corridor is going to decline substantially in the future, limiting the volumes of gas available for the Ukrainian route.

The sanctions against Nord Stream 2 have delayed the finalization of the project by eighteen months and have postponed Gazprom’s investments into ramping up production on Yamal and expanding the pipeline transportation capacity from the region.

At the main Bovanenkovo field, the near-term nameplate production capacity of 115 Bcm per annum was reached in 2018, but actual production has ramped up more slowly, reaching 99 Bcm in 2020. In



1H 2021, Bovanenkovo produced 58 Bcm, testing the upper limit of full capacity. The capacity of the two pipelines built to transport production from the field (see above) matches the 115 Bcm per annum production capacity of the Bovanenkovo field but some compressors are yet to be added to ensure these levels of throughput. In the future, Gazprom is planning to bring the overall productive capacity at Bovanenkovo to 140 Bcm through the development of wet gas from the deeper Neocomian layers of the field in addition to the gas currently produced from the Cenomanian layers. The technical implementation of this program has been handed to Gazpromneft because of the necessity to deal with liquids.

Meanwhile, Gazprom has been aiming at launching production at the Kharasavey field (also on the Yamal Peninsula) in 2023. Kharasavey is located about 100 kilometers north of Bovanenkovo and connecting the two fields will enable the injection of Kharasavey gas into the Russian GTS. To accommodate the additional output from Kharasavey, Gazprom has been planning a third line on the Bovanenkovo-Ukhta / Ukhta-Torzhok route, also with a launch of 2023. The uncertainty over the utilization levels of Nord Stream 2 may however lead to a delay in the implementation of these plans and may restrict the availability of Russian gas for Europe during times of peak demand, such as during 2021. Had Nord Stream 2 been operational in 2020, as originally planned, Europe would most likely not be facing such a gas deficit and extremely high gas prices this year.

### Rising flexibility requirements and gas storage

The question of flexibility is always important for the gas industry because of the seasonal nature of gas demand. Flexibility is a major concern in Europe because of declining indigenous production which has provided a significant amount of seasonal swing in the past. Historically, the production swing from the Dutch Groningen field was key to flexibility in Northwest Europe. With gas output at the field down more than 40 Bcm in the past five years, a lot of this flexibility has been lost. European gas imports have grown, but they have a flatter seasonal profile than consumption. Moreover, and not only in the past few years, Europe's growing call on gas has been met with rising imports from Russia, and the seasonal demand swing has been also secured by flexible Russian gas deliveries. As we have demonstrated above, in 2021 the increase in Russian exports proved to be insufficient to meet the rising call on gas from European buyers and this led to the depletion of European gas storage, which has in turn put upward pressure on spot gas prices. By the summer, when it became clear that Europe's storage injection program was lagging behind, gas price escalation became unstoppable.

Without a doubt, the extremely low levels of gas in European storage this autumn have contributed to a price spike. Indeed, the combination of weather factors, growing demand and limited supply have coincided to keep gas storage levels in Europe in 2021 well below usual levels. (See Figure 18)

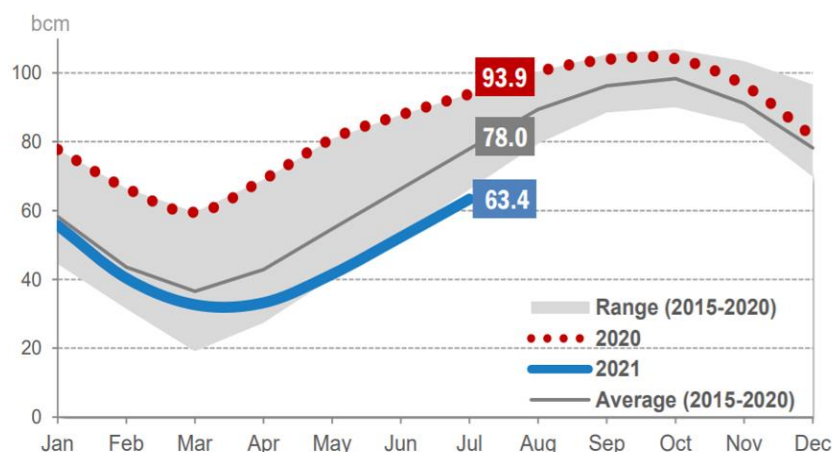
In our previous research we have argued that “gas flexibility will remain a key concern for Europe, because of declining indigenous production. At the same time, increasing the call on Russian pipeline gas exports to Europe, above and beyond the current levels of about 200 Bcm per annum, would require finding a new, long-term balance of interests between buyers and sellers that would probably require monetization of the flexibility embedded in Gazprom contracts but not reflected in current pricing arrangements”.<sup>22</sup>

Russia's seasonal flexibility requirements have been relatively stable over the past ten years, growing slightly in line with the growth in domestic demand. This is linked to the composition of Russia's gas demand that also has not changed much, and Russia has been using the combination of production swing and storage use to meet the seasonal profile of demand. Winter supply is usually organized by the principle of substitution: demand in the regions located far away from the main centres of supply necessarily comes from storage which is later replenished.

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<sup>22</sup> Yermakov V. V. *It Don't Mean a Thing if It Ain't Got That Swing: Why Gas Flexibility Is High on the Agenda for Russia and Europe* – OIES Energy Comment, 2019, p.26

**Figure 18: Gas storage levels in Europe**

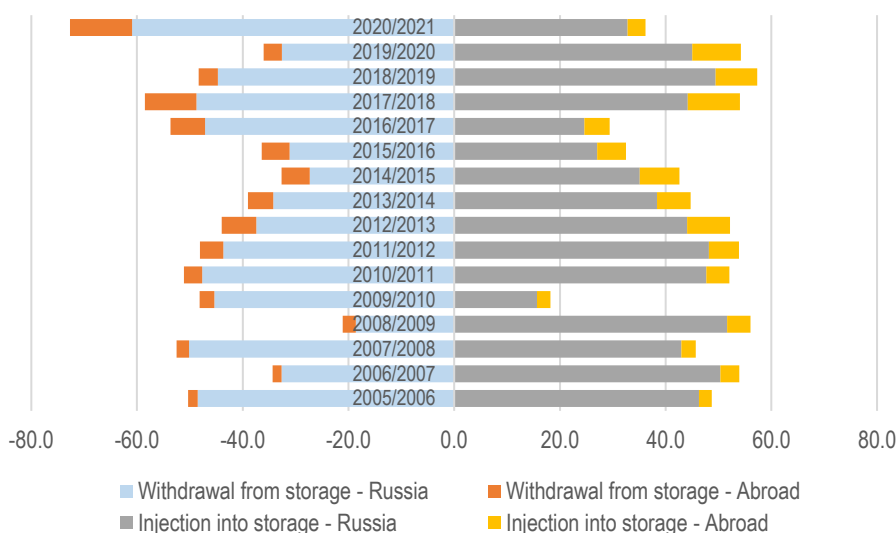


Source: Gazprom: 2Q IFRS Results, 31 August 2021 – presentation for investors

The seasonal demand in those regions in closer proximity to the supply centres is covered by production swings. Since the average transportation distances for domestic gas supplies in Russia exceed 2300 kilometers, and average distances to export markets exceed 3000 kilometers with many foreign destinations being over 4000 kilometers away, it normally takes several days to ship gas over these long distances.

The statistics on Gazprom’s withdrawals from storage and injection into storage during 2020/21 season show that the balance was heavily skewed in favour of withdrawals. (See Figure 19)

**Figure 23: Gazprom’s use of storage in Russia and abroad (Bcm)**



Injection season – current year

Withdrawal season – Q3 and Q4 of the current year and Q1 and Q2 of the next year

Source: OIES, data from Gazprom in Figures, 2016-2020

High overall demand for Gazprom gas in the 1H 2021 has apparently affected the domestic injection program during the summer. Gazprom reported that as of June 30, 2021, the volume of gas injected into Russian storage amounted to only 25.4 Bcm. The necessity to continue pumping gas into domestic

storage to bring the volumes to the required 75 Bcm before the start of the heating season apparently sharply reduced the availability of Gazprom gas for exports during Q3.

## Conclusion

The big bounce in Russian gas production in 2021 has proven to be insufficient to meet the simultaneous spikes in demand at home and abroad. Russian gas output has risen robustly and has been close to its maximum productive capacities but the necessity to fill the depleted domestic gas storage facilities in Q3 2021 limited the availability of Russian gas for Europe when it was most needed. The market tightness in Europe stems from a combination of demand-side factors such as weather and economic recovery, alongside supply-side factors including declining indigenous European gas production and reduced supply from other exporters of gas to Europe (except for Algeria), including LNG.

Indeed, Russian exports to Europe this year have reached the record levels last seen in 2018-19, focusing mostly on Turkey and Germany – the two markets that are connected to the Russian gas system by direct undersea pipelines. Moreover, with other supply sources to Europe falling, and given the changing geography of Russian reserves, it appears that Russia cannot single-handedly balance sudden spikes in European gas demand.

Russia is not running out of gas and its prolific gas reserves allow Russia to meet much higher overall demand, but this requires time, money, and contractual assurances of offtake. In addition, the geography of Russia's future spare productive capacity has changed: a lot of new reserves are available and ready for development on the Yamal peninsula, whereas legacy production in the NPT is declining. This tectonic shift in Russia's production base has been accompanied by a change in the configuration of the gas transportation system and gas flows within Russia and abroad. And given the regulatory uncertainty around utilization rates on Nord Stream 2, Gazprom seems to be reluctant to add new productive capacities on the Yamal Peninsula proactively for fear of idling the investments.

Another area of future production growth is Eastern Siberia where gas output has been rising to meet the schedule of contracted deliveries to China via the Power of Siberia. Gazprom is negotiating new contracts with China, which may become game changers in the overall orientation of Russian gas export flows.

On the other hand, flows via Ukraine and Belarus/Poland are unlikely to increase. Moreover, these flows may exhibit significant volatility, which is already the case for Yamal-Europe and is likely to become the new reality for Ukraine after the expiration of the transit ship-or-pay deal with Gazprom in 2024.

Gas trade between Russia and Europe has had its ups and downs for over half a century but has brought tremendous benefits to both sides. Europe's energy policy ambition of a fast shift to a carbon-neutral economy for which natural gas is undesirable and merely a near-term, stop-gap solution is a threat to Russia-Europe gas trade. In these circumstances, Russia is likely to intensify its efforts to diversify away from its dependence on the European gas market both in terms of methods of gas delivery and target markets. This means the end of the era of new upstream investments targeting Europe and new gas pipelines from Russia to Europe. Instead, Russia intends to allocate new investment to developing new LNG capabilities and accelerating its Pivot to the East by offering China a new pipeline connecting its Western Siberian gas reserves with Northern China via Mongolia.

Will 2021 with its energy insecurity and record gas prices in Europe be a harbinger of things to come? Will higher gas prices lead European power plants to switch back to coal, resulting in a setback for European climate policies? Or will 2021 have been a perfect storm that will not be repeated? To be sure, the start-up of Nord Stream 2 could lead to higher Russian gas flows into Europe if the regulatory hurdles are overcome, but the ramp up of flows along this line is going to take time and the initial volumes this year, as Gazprom indicated, cannot exceed around 5 Bcm, even if Gazprom receives all necessary regulatory approvals in record time. This is not sufficient to turn the tide, and the fundamentals indicate extremely tight gas markets in Europe this winter.