Russian gas balances in December 2021 and into 2022: swinging back to normal

- Swings in Russian gas demand and supply, that have contributed to a supply squeeze in the European gas markets in 2021, might go into reverse late in 4Q21 and in 2022.

- Unusually, Gazprom Group (Gazprom) was still filling Russian gas storage in October-November. In addition, the weather in Russia in early autumn was closer to seasonal norms and colder than last year, increasing domestic gas demand. In October, Gazprom output (up 4% YoY) may not have been sufficient to compensate for net injections into Russian storage as well as a rise in domestic gas consumption. This might have led to lower exports. As of mid-November, this supply and demand pattern was still evident.

- In December, Gazprom may be able to revert to a more normal seasonal supply and demand pattern. We expect domestic gas consumption to be slightly down YoY, based on Russian weather forecasts, we also forecast higher YoY output and storage withdrawals close to the three-year average. This should allow for a 16% month-on-month rebound in exports. It might restore the company's role as a reliable gas supplier to Europe. The alternative (and riskier) strategy for Gazprom is to hold back on storage withdrawals in Russia, and to keep gas supplies ready to meet European and domestic demand during colder weather and later in the winter season. This stored gas may potentially be used for deliveries via the Nord Stream-2 pipeline in 2022.

- In 2021, the Russian gas system had to cope with an estimated 77 billion cubic meters (bcm) of additional demand compared to last year. In contrast, total gas demand is expected to go down by 13 bcm in 2022 in our base case scenario. We forecast a fall in domestic gas consumption, and lower injections into Russian gas storages next year, provided the 2021/22 winter demand is close to the five-year average. At the same time, Russian gas exports into Europe (inc. Turkey and the Ukrainian backhaul) are expected to rise by 17 bcm YoY to 193 bcm in 2022, if the Nord Stream-2 pipeline is operational.

- We look at two scenarios for the Russian gas balances in 2022: with and without the launch of the Nord Stream-2 (NS2) pipeline. In our base-case scenario, the NS2 pipeline will be operational and will ship 11 bcm of gas in 2022. It should allow Gazprom to increase exports to Europe (exc. Turkey and the Ukrainian backhaul) to an estimated 158 bcm, an additional 14 bcm YoY. This scenario ties with our assumption of a rebound in exports to Europe in December and early 2022.

- If the NS2 pipeline is not operational in 2022, we expect Gazprom to fully utilise the Yamal-Europe pipeline, and book additional transit capacity via Ukraine during cold spells to meet peak demand. In this scenario, Gazprom will still increase exports to Europe (exc. Turkey and Ukraine) by 4 bcm a year to 148 bcm in 2022. We forecast the company's output would be down by 18 bcm YoY to 496 bcm.

- Our modelling shows that average export price of Russian-origin gas (inc. Europe, Turkey and the Former Soviet Union (FSU), which will be reported by the Russian customs in early December, was around $370 per 1,000 cubic meters in October. The Gazprom gas price to Europe (exc. Turkey and sales via the Electronic Sales Platform (ESP) is estimated at $460 per 1,000 cubic meters. This is at a 42% discount to the closing price of the October 2021 TTF futures contract.

Russian gas balance in 4Q21: could it be business-as-usual in December?

Table 1. Russian estimated gas balances in 4Q21 and change YoY, bcm per quarter

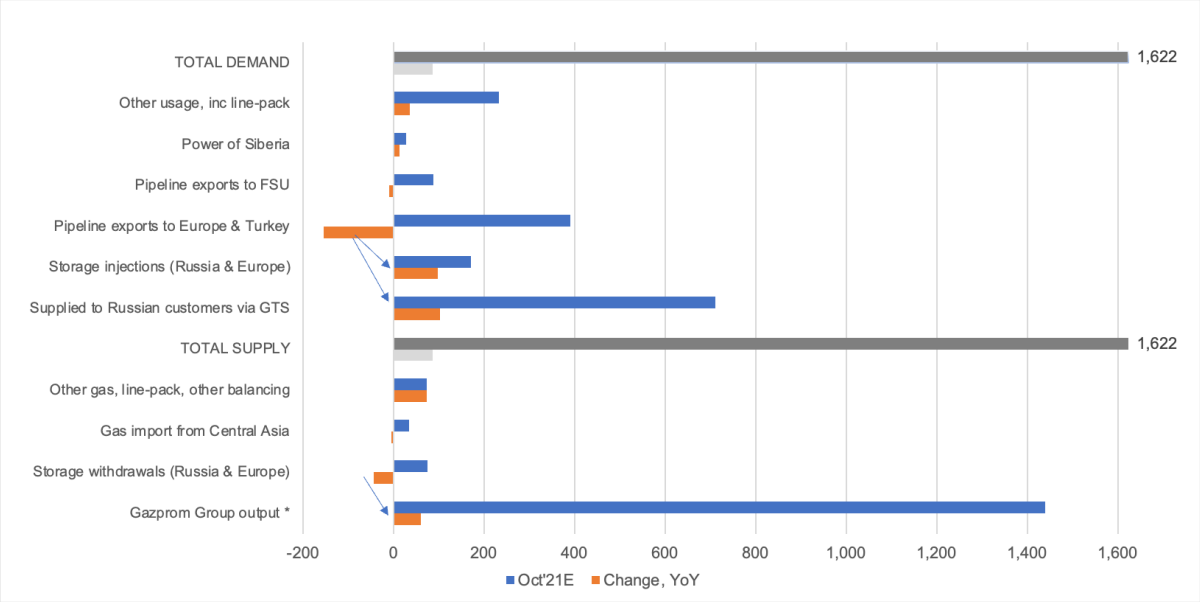
	4Q20E, bcm	4Q21F, bcm		4Q20E, mn cu m/d	4Q21F, Mn cu m/d
Gas supply	**221**	**219**		**2,404**	**2,381**
Russian gas output, inc.	**192**	**200**		**2,085**	**2,170**
Gazprom Group output *	130	136		1,417	1,484
Gazprom only (exc. G.Neft)	125	129		1,357	1,401
Oil companies (inc. G.Neft)	25	28		270	307
All other gas producers	18.7	18.9		203	206
Storage withdrawals	**15.4**	**15.1**		**167**	**165**
Russian storage	8.0	8.5		87.4	92.2
European and FSU storage	**26.3**	**16.4**		286	178
Other gas supplies, inc. Central Asia	**23.6**	**15.2**		**257**	**165**
Pipeline line-pack, other	**2.4**	**1.0**		**25.7**	**10.4**
	4Q20 E	**4Q21 F**		**4Q20E, mn cu m/d**	**4Q21F, Mn cu m/d**
Gas demand	**221**	**219**		**2,405**	**2,381**
Gas supplied to Russian customers	**142**	**146**		**1,540**	**1,586**
Outside Gazprom GTS network	35	35		376	386
Via Gazprom's GTS network	107	110		1,164	1,201
Storage injections	**2.7**	**10.7**		**29.5**	**116**
Russian storage	2.1	7.5		22.6	81.3
European and FSU storage	**0.5**	**3.0**		5.7	32.7
Pipeline line-pack, other usage	**2.0**	**1.3**		**21.7**	**14.1**
Total gas exports, inc.	**75**	**61**		**814**	**665**
Pipeline exports to Europe & Turkey	51	37		560	405
To Turkey only *	7.5	7.5		81.1	81.3
To Ukraine **	1.1	1.1		11.5	12.2
Pipeline exports to FSU	11	10		119	110
LNG production	10.9	11.3		118	123
Power of Siberia	1.5	2.6		16.4	27.9

Source: Author's estimate. Note: * = reference only, ** = inc. backhaul and re-exports

- So far in 4Q21 Russian gas balances have been disrupted by the prolonged gas storage injection season in Russia, and an uptick in domestic gas consumption compared to last year, because of colder weather.

- In December 2021, we expect the Russian gas supplies to revert to their seasonal norms with higher storage withdrawals in Russia. Domestic gas consumption is expected to go slightly down YoY. This should allow Gazprom to increase exports and move closer to its annual export target (to Europe and Turkey) of 183 bcm, including 1.5 bcm of forecast injections into European gas storage in December.

Graph 1. Gazprom estimated gas balances in October 2021E, mn cubic meters per day



Source: Author's estimate

- October 1 would usually be the official start of a six-month heating season in Russia when Gazprom[1] starts withdrawing gas from Russian gas storage and increasing gas production, in order to meet seasonal demand both in Russia and abroad.

- Unusually, Gazprom continued to fill its Russian gas storages in October-November and planned to complete the injection season by around November 8[2]. We assume that Gazprom had to produce more gas in October and November both to replace the volumes which are usually withdrawn from Russian storage, and also to fill some of Russian storage in October-November.

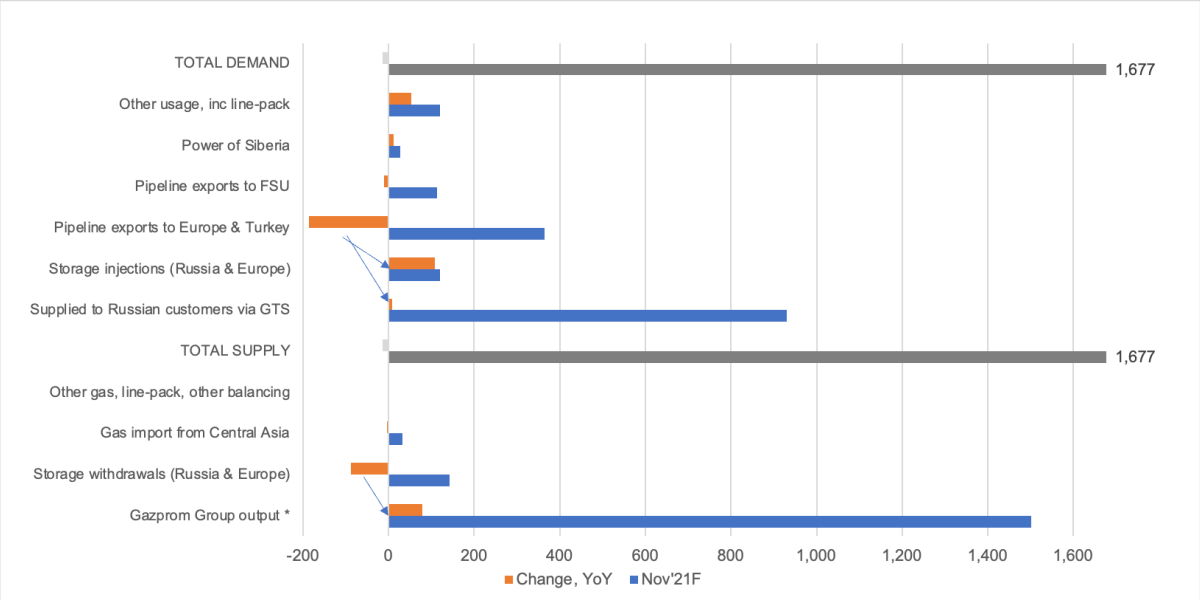
- The temperatures in September-October were closer to seasonal norms compared to the milder start of the autumn in 2020. We estimate that Gazprom's domestic gas deliveries were up 102 mn cubic meters a day (mn cu m/d) YoY in October, partially because of the colder weather.

- The unusual combination of low storage withdrawals and continuous storage injections may have resulted in a swing from estimated net storage withdrawals of 44 mn cu m/d in October last year to estimated net storage injections of 100 mn cu m/d in October this year. At the same time a YoY increase in domestic demand (up est. 102 mn cu m/d) might partially explain a YoY fall in Gazprom gas exports (down est. 158 mn cu m/d) to Europe and Turkey despite an increase in gas output.

[1] Gazprom Group is a consolidated entity which includes companies in the natural gas, oil, power sectors and other businesses. The company reports under the IFRS standards. In this report, Gazprom and Gazprom Group refer to the natural gas business of Gazprom Group.

[2] Газпром использует нерабочие дни в РФ для дополнительной закачки в России, затем начнет закачку в Европе, 28 October 2021, Interfax

Graph 2. Gazprom estimated gas balances in November 2021E, mn cubic meters per day



Source: Author's estimates

- As of mid-November, Gazprom demand/supply pattern might have been quite similar to the one seen in October.

- Gazprom reported that its cumulative year-to-date natural gas output was 445 bcm as of November 15, 2021[3] It would mean that the company produced 22.6 bcm of natural and associated gas in the first 15 days of November, or est. 1,500 mn cu m/d on average, up 77 mn cu m/d compared to last year.

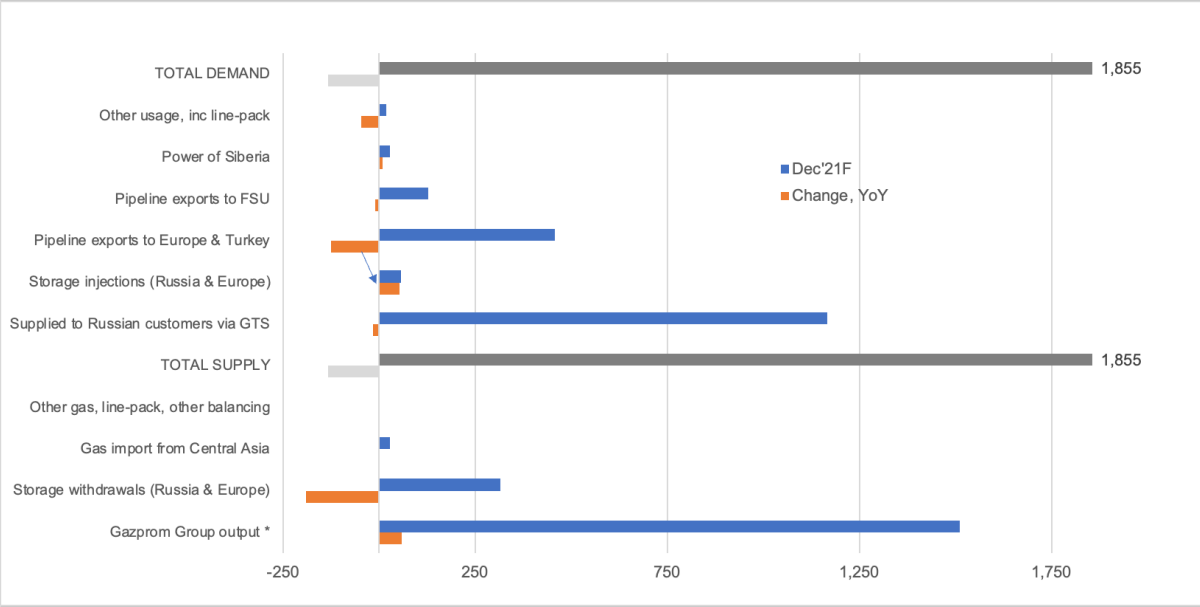
- At the time, the level of domestic gas consumption was close to that of the last year at around 850 mn cubic meters a day in the first 15 days of November (vs est. 836 mn cubic meters a day in November 2020).

- Exports to far abroad (inc. Europe, Turkey and China) were 164.8 bcm as of November 15, 2021, up 6bcm in the first 15 days of November. It would mean that exports were running at 400 mn cubic meters a day, or 29% down YoY.

- We assume that Gazprom continues to withdraw less gas from Russian gas storage in November (forecast net withdrawals of 23 mn cu m/d) compared to last year (est. net withdrawals of 219 mn cu m/d). It means that the company will have much fuller storage in Russian going into the next year.

[3] «Газпром» уже поставил в Германию и Италию больше газа, чем за весь прошлый год. Telegram, November 15, 2021

Graph 3. Gazprom estimated gas balances in December 2021F, Mn cubic meters per day



Source: Author's estimate

- Our estimates of Gazprom gas balances for December show that the company might be operating in a more typical environment.

- We expect domestic gas consumption to be marginally down YoY in December. The average temperature across Russia in December 2020 was minus 10.4C, at the lower end of the average range of minus 8-10C. This year, the Russian weather service (Hydrometcenter of Russia) forecasts that the temperatures in December might also be below seasonal norms while the heating season in general might be closer to normal or even milder[4].

- We forecast that withdrawals from Russian gas storage in December could be still running below the levels we estimate for the last year (Gazprom reports quarterly storage movements). We also assume net injections in European gas storage.

- We forecast that Gazprom production will be 46 bcm in December 2021 (1,510 mn cu m/d) in December. It should allow the company both to meet domestic demand and increase physical exports to 460 mn cubic meters per day compared to November, up 17% MoM.
- A meaningful increase in the Russian gas exports in December (even if primarily to fill Gazprom's own storages) could help reducing spot prices and may stimulate additional demand for Russian gas supplies. It might also repair Gazprom's reputation as a reliable supplier to European gas markets. It would show that the company is content to use existing transit capacity to Europe while the certification process for the Nord Stream-2 pipeline (and other political negotiations) are running their course.

[4] ВЕРОЯТНОСТНЫЙ ПРОГНОЗ ТЕМПЕРАТУРНОГО РЕЖИМА в РОССИИ на отопительный период (октябрь-март) 2021/2022 гг, September 27, 2021, https://meteoinfo.ru/heating-period

- We believe that if the goal of Gazprom (and the Russian administration) is to see the Nord Stream-2 in operation, it would be a prerequisite for Gazprom to act in its best commercial interests during the coming winter. This would involve maximising winter sales to Europe, which may include building up own storages in Europe and offering additional export volumes via the ESP platform. In our view, the successful completion of the NS-2 certification process by April 2022 – our base case scenario – only works in conjunction with additional Russian gas exports in the coming months.

- We note that Gazprom would need to book some additional capacity via Ukraine and to fully utilise the Yamal-Europe pipeline via Belarus and Poland.

- In an alternative scenario Gazprom might opt to keep its Russian storage fuller than usual and not increase exports to Europe in December and early in 2022. This would happen in anticipation of exporting higher volumes at even higher prices to Europe later in the winter season as European storages become get depleted.

- Under this scenario we assume that Gazprom will still supply additional volumes to Europe via existing transit routes (by booking additional capacity) to meet peak demand. However, the Russian gas company might run the risk of missing out on additional export sales and having full storages in Russia at the end of a warmer than expected heating season. It could also result in a fall in production in 2022, in our estimates.

- The underutilisation of existing transit capacity (both through Belarus and Ukraine) during the winter season of 2021/22 could backfire. If the strategy is to wait for the emergency approval of the NS-2 pipeline for the delivery of additional gas (one of the possible options discussed in the academic research[5]) it could equip Gazprom's opponents with more ammunition against the approval of NS-2, in our view.

[5] Nord Stream 2: on the verge of sending gas to Europe. The Oxford Institute for Energy Studies, November 2021

Table 2. Russian gas system balances for 2020E-2022F, bn cubic meters

	2020E	2021F	2022F		2020E	2021F	2022F
	bcm				Mn cu m/d		
Gas supply	**763**	**841**	**829**		**2,084**	**2,299**	**2,266**
Russian gas output, inc.	**692**	**758**	**753**		**1,890**	**2,071**	**2,057**
Gazprom Group output *	454	514	507		1,241	1,406	1,385
Gazprom only (exc. G.Neft)	432	488	474		1,180	1,334	1,295
Oil companies (inc. G.Neft)	99.2	107	114		271	291	312
Novatek (inc. Yamal LNG)	69.7	72.9	74.3		191	199	203
Other Russian producers	60.6	60.9	59.8		166	166	163
PSA producers	30.3	29.2	30.8		82.7	79.8	84.2
Storage withdrawals	**47.0**	**62.5**	**56.0**		**128.3**	**170.9**	**153.0**
Russian storage	40.4	52.5	49.2		110.3	143.3	134.5
European and FSU storage	5.7	9.2	6.0		15.6	25.2	16.3
Other gas supplies, inc Central Asia	**17.9**	**19.5**	**19.3**		**48.9**	**53.2**	**52.9**
Pipelines line-pack, other	**6.8**	**2.2**	**1.8**		**18.6**	**6.0**	**4.9**
	2020E	**2021F**	**2022F**		**2020E**	**2021F**	**2022F**
	bcm				Mn cu m/d		
Gas demand	**764**	**842**	**829**		**2,088**	**2,300**	**2,265**
Gas supplied to Russian customers	**464**	**506**	**500**		**1,269**	**1,382**	**1,365**
Outside Gazprom GTS network	122	132	133		332	361	363
Via Gazprom's GTS network	343	374	367		937	1,021	1,001
Storage injections	**36.2**	**66.9**	**47.9**		**98.9**	**182.8**	**131.0**
Russian storage	32.8	61.3	43.0		89.6	167.6	117.5
European and FSU storage	**2.4**	**5.6**	**4.9**		**6.6**	**15.2**	**13.5**
Pipeline line-pack, other usage	**6.7**	**6.0**	**0.1**		**18.3**	**16.4**	**0.3**
Total gas exports, inc.	**259**	**265**	**280**		**707**	**725**	**766**
Pipeline exports to Europe & Turkey	175	176	193		477	480	528
To Turkey only *	16	29	24		**44.7**	**77.9**	**65.3**
To Ukraine only **	16	3.5	11		**42.6**	**9.5**	**30.3**
Pipeline exports to FSU	38.4	37.3	35.6		105	102	97
LNG exports	42.0	39.9	41.2		115	109	113
Power of Siberia	4.1	9.9	11.1		11.3	26.9	30.4

Source: Author's estimates. Note: * = reference only, ** = includes re-exports and backhaul

- The ongoing year has been unusual for the Russian gas industry. The total demand for the Russian gas system is forecast to increase by 77bn cubic meters YoY in 2021.

- In our view this has been a result of:

  (1) An unusually cold winter season of 2020/2021. Over 60 bcm of gas has been required for injections into gas storage in Russia, an extra 29 bcm of gas compared to last year.

  (2) Gazprom gas deliveries to Russian consumers[6] were up 28 bn cubic meters YoY in 1H21, due to cold winter of 2020/21. Deliveries in 3Q21 were up an estimated 3 bn cubic meters YoY and are expected to increase by 4bn cubic meters in 4Q21.

[6] Gas deliveries to Russian consumers under the Russian accounting standards, unconsolidated. Gazprom held around 67% share of the domestic gas market deliveries in 1H21. Gazprom RAS accounts, 1H 2021

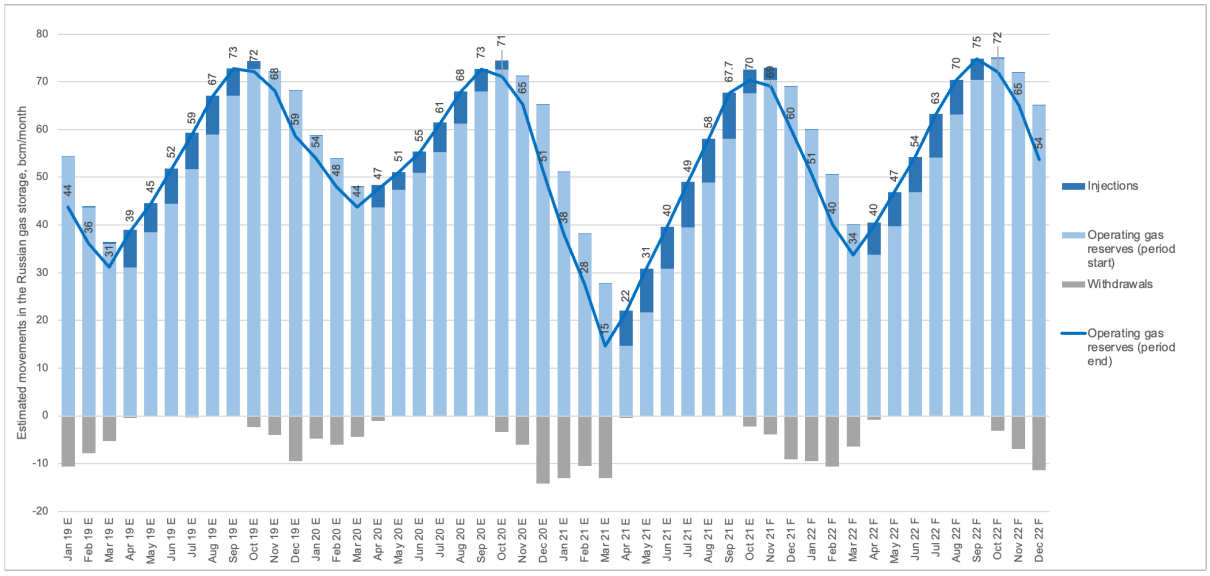
(3) A sharp rise in spot prices made Gazprom's contract prices (such as oil-linked and long-term fixed) unusually competitive. Exports of Russian-origin gas to Germany and Turkey were up 27 bcm in the first ten months of 2021, according to Russian customs data. At the same time, there was a sharp fall in re-exports to Ukraine (which shows in Gazprom's exports to Europe), down 12.5 bcm YoY to 2.5 bcm in 10 months of 2021.

(4) We forecast total exports (including Europe, Turkey, China and the Ukrainian re-exports) to reach 185 bcm in 2021, up 7 bcm YoY. Exports to Europe (inc. Turkey and the Ukrainian backhaul) are forecast at 176 bcm in 2021, below the company's target of 183 bcm. This is still contingent on a forecast MoM increase in gas export flows from Russia in December.

- The additional 77 bcm of demand in the Russian gas system in 2021 is being met by extra output from Russian gas producers (up an estimated 66 bcm YoY) and gas storage withdrawals (up an estimated 15 bcm YoY), adjusted for changes in pipeline line-pack and other balancing items.

- We believe that some of the above-mentioned trends might go into reverse next year. We forecast that demand in the Russian gas system will be approximately 12 bcm down YoY in 2022. It is due to lower storage injections (down 18 bcm YoY) and a 6 bcm YoY fall in domestic demand. At the same time, pipeline gas exports to Europe, (inc. Turkey and the Ukrainian backhaul) are forecast to rise by 17 bcm YoY to 193 bcm in 2022. The fall in demand will cut Gazprom output by 8 bcm to 507 bcm in 2022, in our estimates.

Graph 4. Estimated monthly balances in the Russian gas storage, bn cubic meters per month



Source: Author's estimate

- In the winter season of '20/'21 (October 1, 20, to April 1, 21) Gazprom withdrew over 60 bcm of gas from Russian storage and 8 bcm from gas storage in Europe and the Former Soviet

Union (FSU)[7]. The gas must be replaced after every winter season back to the working capacity of 72.6 bn cubic meters (in Russia)[8], around 1 bcm in the FSU, and 8 bcm in Europe.

- Unusually, Gazprom had to extend its storage injection season in Russia by over a month from mid-April 2021 until November. We estimate that around 7 bcm of natural gas was injected into Russian gas storages in October-November, compared to 2 bcm in the fourth quarter last year.

- The extended period of gas injections into Russian storage left Gazprom's European gas storage at a very low level of 0.19 bcm at the end October 2021[9]. The Russian gas company planned to start injections into its European gas storages in early November. We forecast that Gazprom will inject around 2.5 bcm of gas into its European gas storages in November-December.

- Once the injections into Russian gas storages are complete, Gazprom might be able to resume the near-normal regime of withdrawals from Russian gas storage. Warmer-than-expected weather (we assume the winter season gas demand in Russia at five-year average), however, might lead to lower withdrawals from gas storage. This would mean much higher gas storage levels at the end of the heating season.

- We estimate that Gazprom will withdraw 47 bcm of gas during the current heating season of 2021/22, in line the five-year average (and 5-year median) of 47 bcm for 2016-2021. It means that the company might have a higher level of gas in Russian storages after the end of the winter season of 2021/22 compared to the year before. The company would then need to inject 43 bcm into the Russian storages in 2022 compared to over 60 bcm in 2021, reducing overall call on the Russian gas by est. 18 bcm YoY.

[7] Gazprom in figures 2016-2020 factbook, Gazprom.

[8] Газпром достиг заданного уровня оперативного резерва газа в ПХГ России - 72,638 млрд куб. м, Interfax, October 29, 2021

[9] Газпром использует нерабочие дни в РФ для дополнительной закачки в России, затем начнет закачку в Европе, 28 October 2021, Interfax

Graph 5. Domestic pipeline gas deliveries and Gazprom's share, bn cubic meters



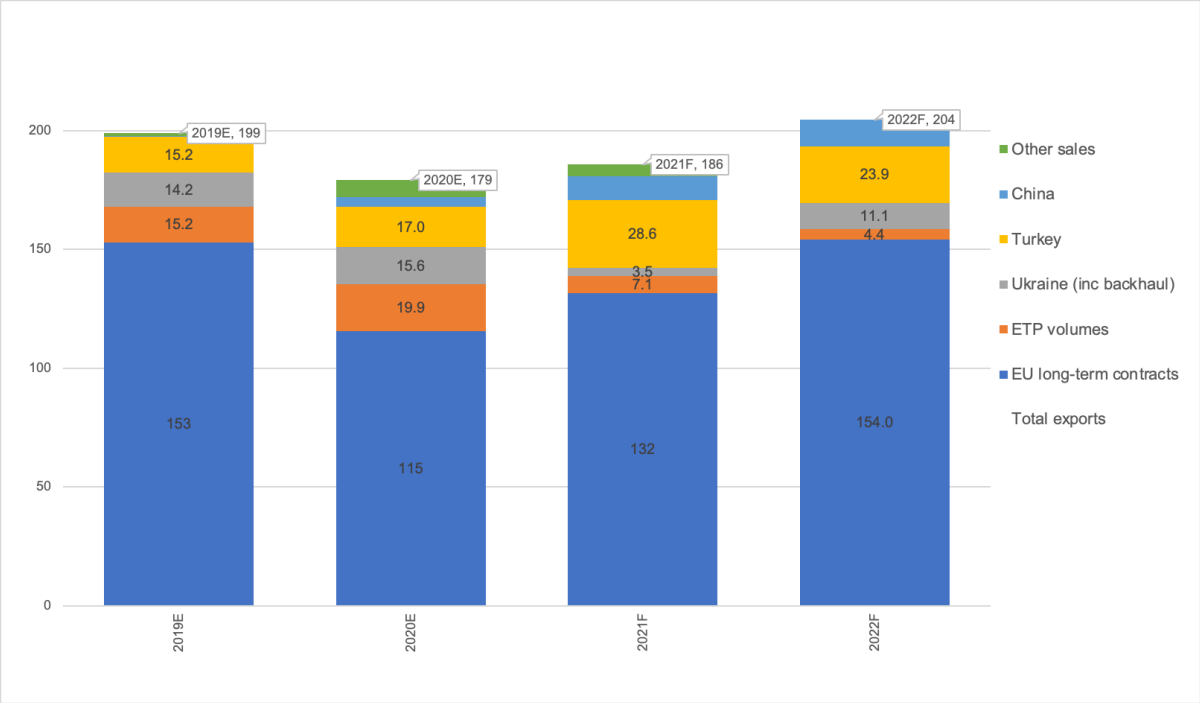
Source: Gazprom RAS and IFRS financials, author's estimate.

- Domestically, Gazprom had to cope with a substantial rise in gas consumption in 1H21. According to Gazprom's accounts under the Russian accounting standards (RAS accounts), the company's domestic deliveries via Gazprom's pipeline increased to 154 bcm in 1H21, up 26 bcm YoY.

- The preliminary numbers for 3Q21 suggest that domestic demand for Gazprom gas deliveries flattened out in 3Q21 at an estimated 40 bcm, up 4 bcm YoY. We estimate that Gazprom domestic supplies in 4Q21 will be up 3 bcm YoY to 86 bcm. Historically Gazprom supplies between 65% and 85% of gas consumers in Russia, with the highest share during the cold winter seasons.

- In 2022 we forecast total domestic gas demand (including gas supplied outside Gazprom's pipeline network) at 500 bcm in 2022, down 6 bcm YoY.

Graph 6. Breakdown of Gazprom exports (exc. FSU) in 2019E-2021F, bn cubic meters



Source: Author's estimate

- Gazprom total gas exports (Europe, Turkey and China, exc. FSU) are forecast at 186 bcm in 2021, compared to the recent high of 199 bcm in 2019. However, the composition of gas exports in 2021 is noticeably different:

  (1) There was a 33% YoY increase in gas sales to Germany, up 10 bcm YoY to 41 bcm in 9M21[10]. The higher gas exports to and via Germany offset lower gas sales to South-East European countries. Gas sales to Slovakia, for example, must have dropped on fall in re-exports to Ukraine.

  (2) Reverse exports to Ukraine (including backhaul) are forecast to decline from 15.5 bcm in 2020 to around 3.5 bcm in 2021, on the back of higher gas prices and relatively low demand for injections into Ukrainian gas storage.

  (3) Sales to Turkey were up 12 bcm to 21 bcm in the first nine months of 2021. The gap between oil-linked prices for the Russian gas made and LNG spot prices has kept Russian gas supplies extremely competitive. Gazprom is likely to exceed its annual target sales to Turkey of 24-25 bcm in 2021 despite a M-o-M fall in exports in October due to legal disputes[11].

  (4) Deliveries of gas sold via Gazprom Export electronic sales platform (ESP) has been significantly lower than last year. Most of the gas delivered via ESP in 2021 was pre-sold in 2020. The amount sold so far in 2021 for deliveries next year was just over 4 bcm as of end October.

[10] ТАБЛИЦА: экспорт Газпрома 9 мес. 2021 г по 9 странам: поставки Германии, Турции, Италии перекрыли результаты 2020 и 2019, Interfax, October 1, 2021

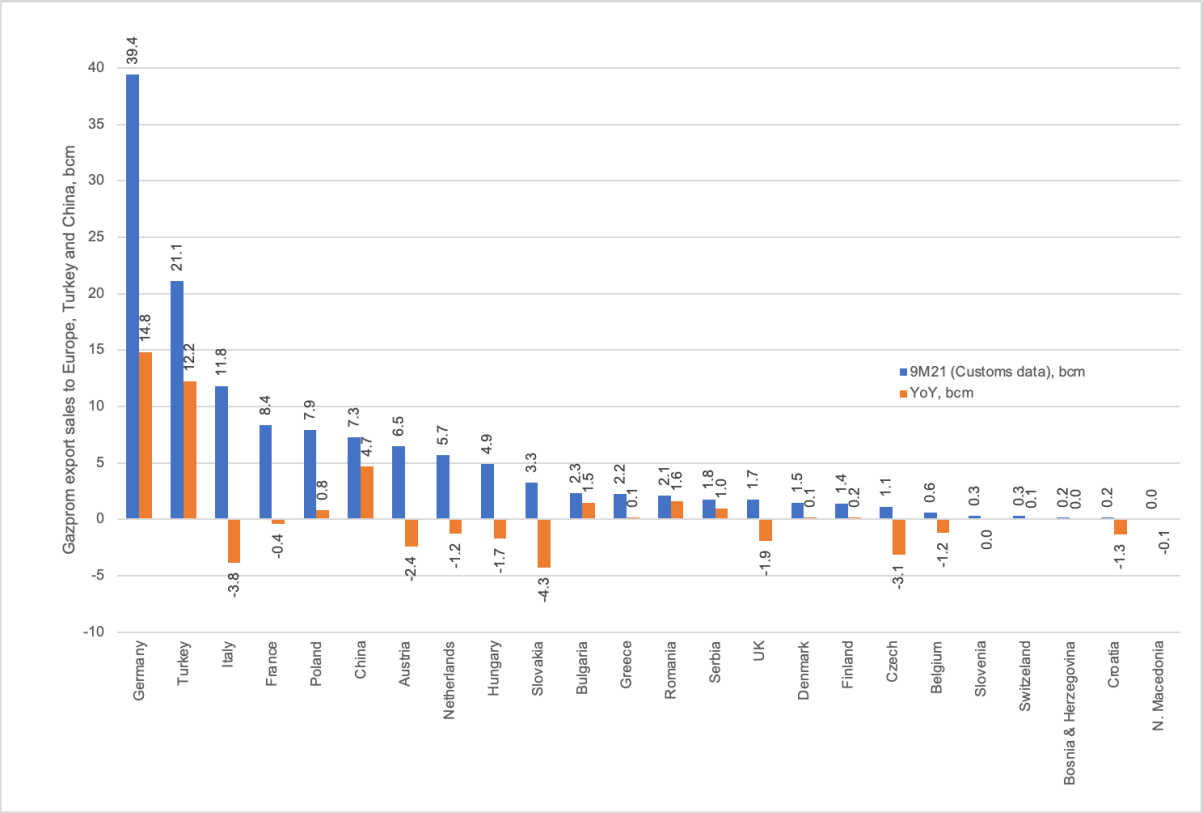
[11] Турция продолжила сокращать импорт газа из РФ из-за долгов перед "Газпромом, Interfax, November 1, 2021

- ESP sales might have been limited by availability of gas on the supply side and high spot prices on the demand side. There was also an issue of limited transit capacity booked by Gazprom Group.

- We forecast that demand for Russian gas exports will remain strong in 2022, but the sales mix will change once again. Ukraine would need to import more Russian gas in 2022 after the winter season of 2021/22 to refill gas storages. Turkey might opt out for more LNG and alternative pipe gas deliveries if spot prices decline closer to levels of the oil-linked gas contracts.

- Total gas exports (including China and excluding FSU) are forecast to rise by 18 bcm YoY to 204 bcm in 2022, with 11 bcm of exports flowing via the additional transit capacity of the Nord Stream-2 pipeline. We also expect Gazprom to transit over 40 bcm via Ukraine and fully utilise the Yamal-Europe pipeline in the base case scenario.

Graph 7. Breakdown of Russian-origin gas exports in the first 9 months 2021, bcm



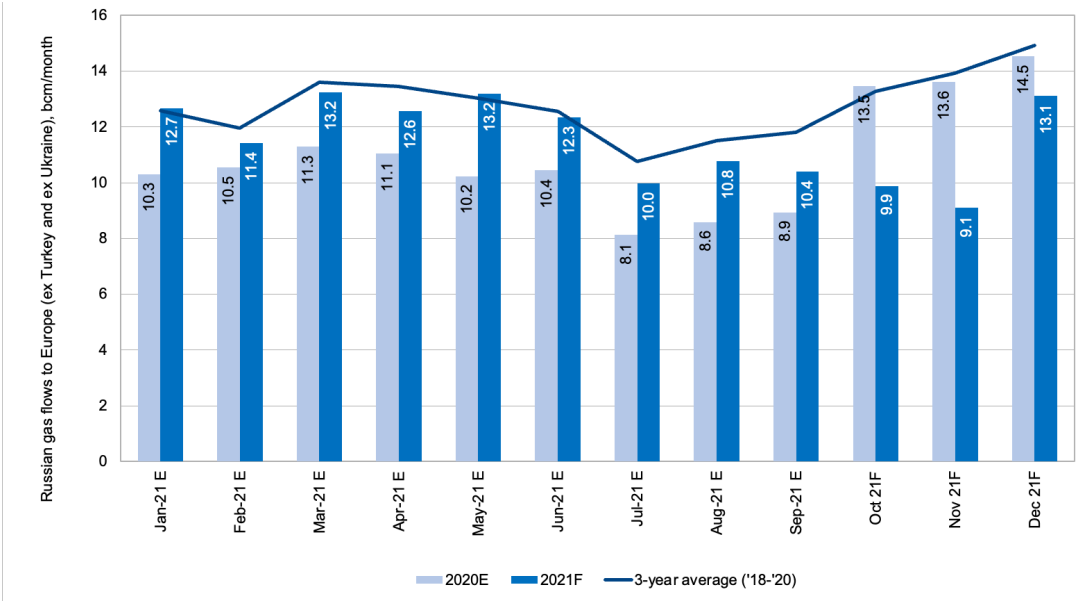
Source: Russian customs data, author's estimate.

Note: gas exports of Russian-origin gas only, excluding sales of Central Asian gas and other gas sales as reported in the company's financials.

- The breakdown of Russian-origin gas exports by country for the first nine months in 2021 illustrates the change in export flows YoY. The preliminary numbers for nine months show that the exports to Germany and Turkey continued to rise YoY, still offset by lower sales in South-East Europe and trading hubs of the UK, Belgium and Netherlands.

- Taking into account preliminary export numbers for October and November, Gazprom is likely to miss the management target of 183 bcm in 2021 even if Gazprom is to increase exports to Europe in December. In our view, Gazprom would need to book additional capacity via Ukraine and fully utilise the Yamal-Europe pipeline in December to come closer to its official and the recently re-confirmed target[12].

Graph 8. Physical flows of gas from Russia to Europe *, bn cubic meters per month



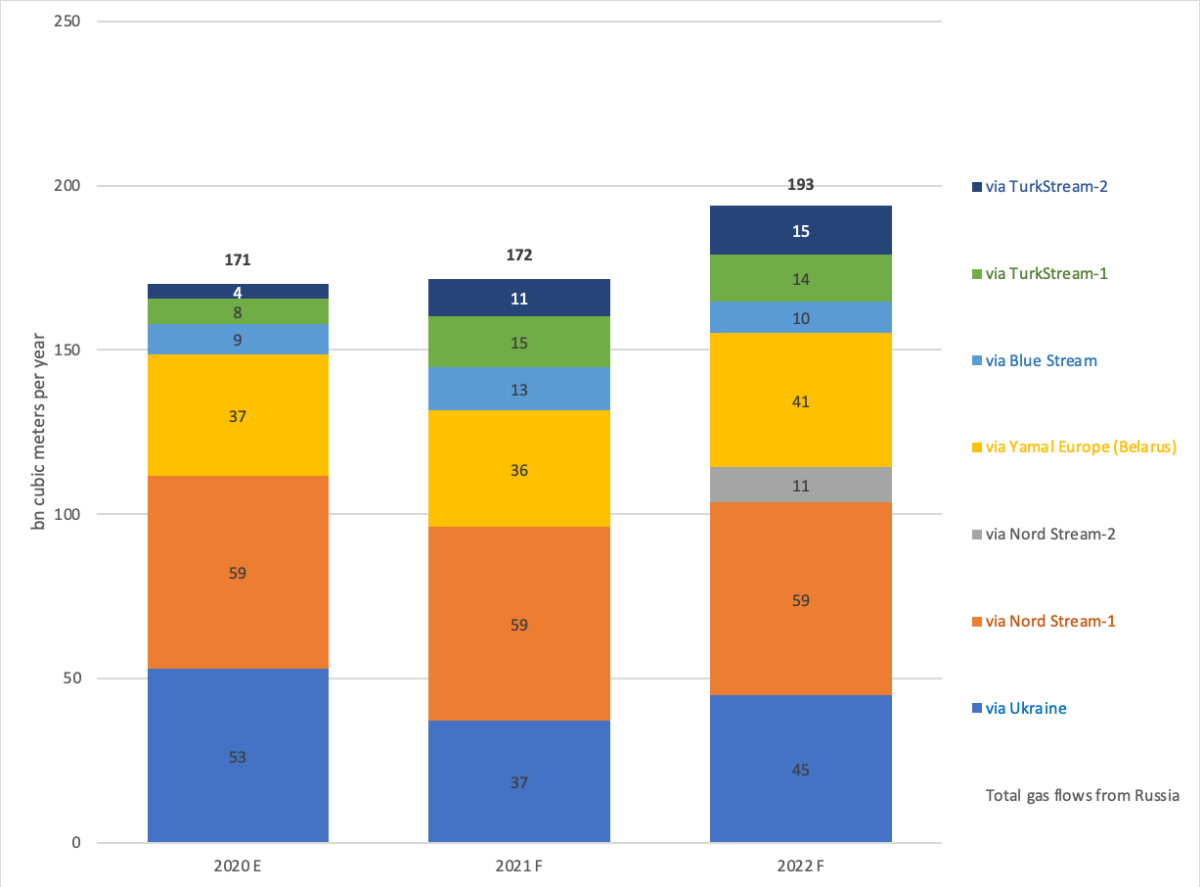
Source: ENSTOG data, Author's estimate. ** Note: gas flows to Europe exclude Turkey and Ukrainian backhaul*

- We note that physical flows of the Russian and Central Asian gas to Europe (excluding Turkey and Ukrainian backhaul) were up 13.5 bcm YoY to 116 bn cubic meters in 10M21, according to our estimates. It is an estimated 8 bcm below the three-year average.

- We expect gas flows to Europe to go up by 19 bcm YoY to 158 bcm in 2022 in our base-case scenario. Under the pessimistic scenario (NS-2 pipeline remains non-operational) we still expect physical exports to go up 4 bcm YoY. The exports will be constrained by booked annual capacity via Ukraine, while we expect Gazprom to use all available capacity of the Yamal-Europe pipeline.

Graph 9. Physical gas flows from Russia to Europe and Turkey, bn cubic meters per year

[12] Gazprom leaves 2021 gas export guidance to Europe unchanged. Reuters, October 25, 2021

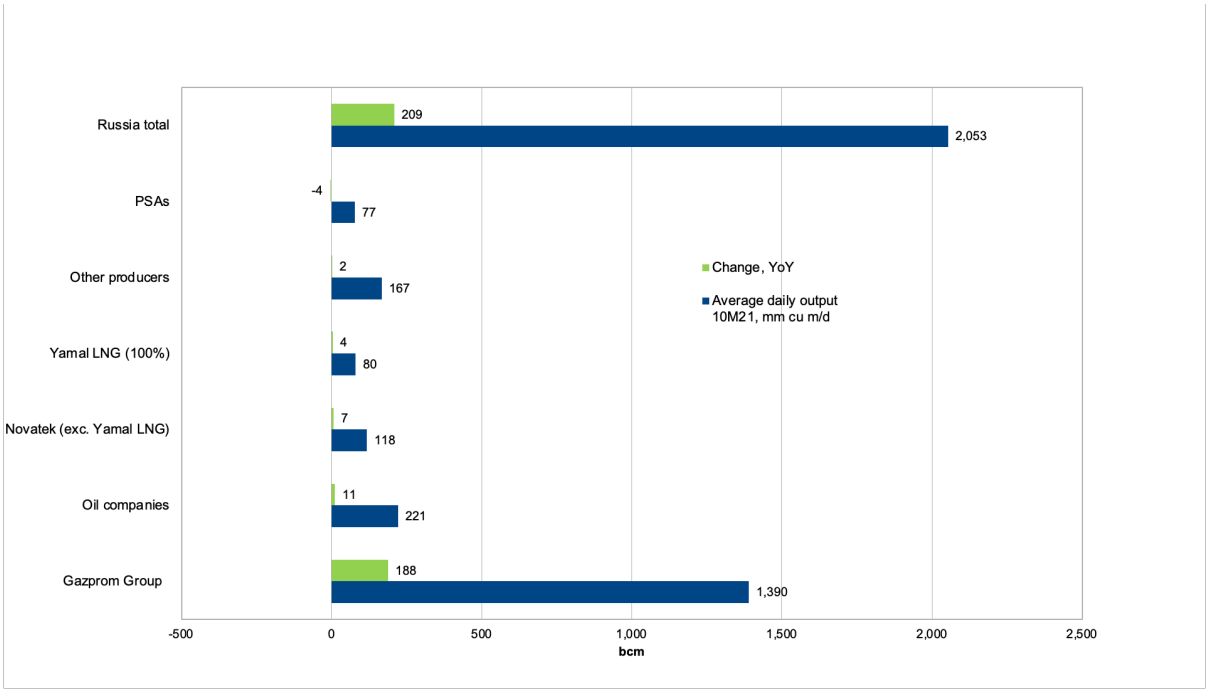


Source: Author's estimate

- Gazprom gas is shipped to Europe (inc. Turkey) via the Nord Stream-1 and Yamal Europe pipelines, the Ukrainian gas transit system, and Turk Stream-1 and Turk Stream-2 pipeline. In the first ten months of 2021, Gazprom has managed to increase export volumes by sending more gas to Turkey and via Turkey to Europe, while reducing transit volumes via Ukraine and Belarus. In 2021, the transit volumes sent via Ukraine might be around 40 bcm in our estimates. We expect Gazprom to fully utilise the Ukrainian gas transit route in 2022 under our base case scenario.

- In 2021, the Russian gas transit via Turk Stream-2 is expected to increase by an estimated 7 bcm YoY. The transit flows via Turkey are likely to increase further in 2022 in our view. The Ukrainian gas system is expected to transit 45 bcm in 2022. However, it includes 11 bcm of gas for the Ukrainian consumption (vs 3.5 bcm in 2021). If there is a deal for direct gas sales from Russia to Ukraine, it could free some transit capacity via Ukraine for additional exports to Europe in 2022.

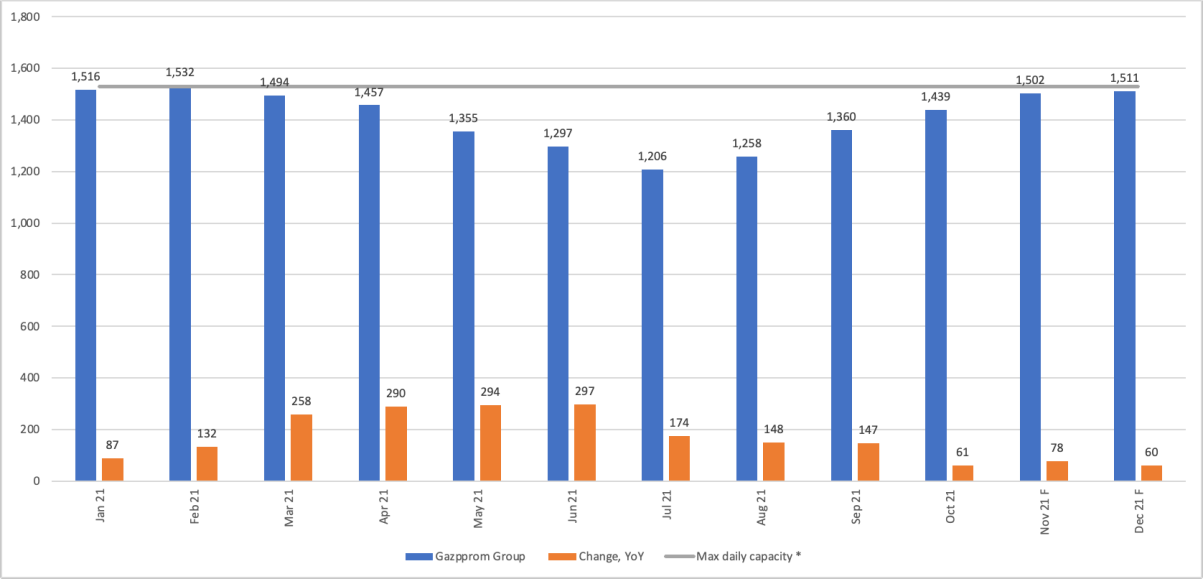
Graph 10. Russian natural and associated gas output in 10M21, mn cubic meters per day



Source: Interfax data, author's estimate

- The natural and associated gas production in Russia was up 11.3% YoY to 2,053 mn cubic meters a day (up 61 bcm to 622 bcm cubic meters in the first 10 months of 2021. Gazprom contributed most to the higher gas output in Russia, followed by the oil companies and Novatek. Gas output by the PSA companies was down YoY due to extended maintenance of the Sakhalin-2 LNG facilities.

Graph 11. Gazprom natural and associated gas output in 10M21, mn cubic meters per day



Source: Author's estimates. *Note: * = maximum capacity includes current capacity at E. Siberia*

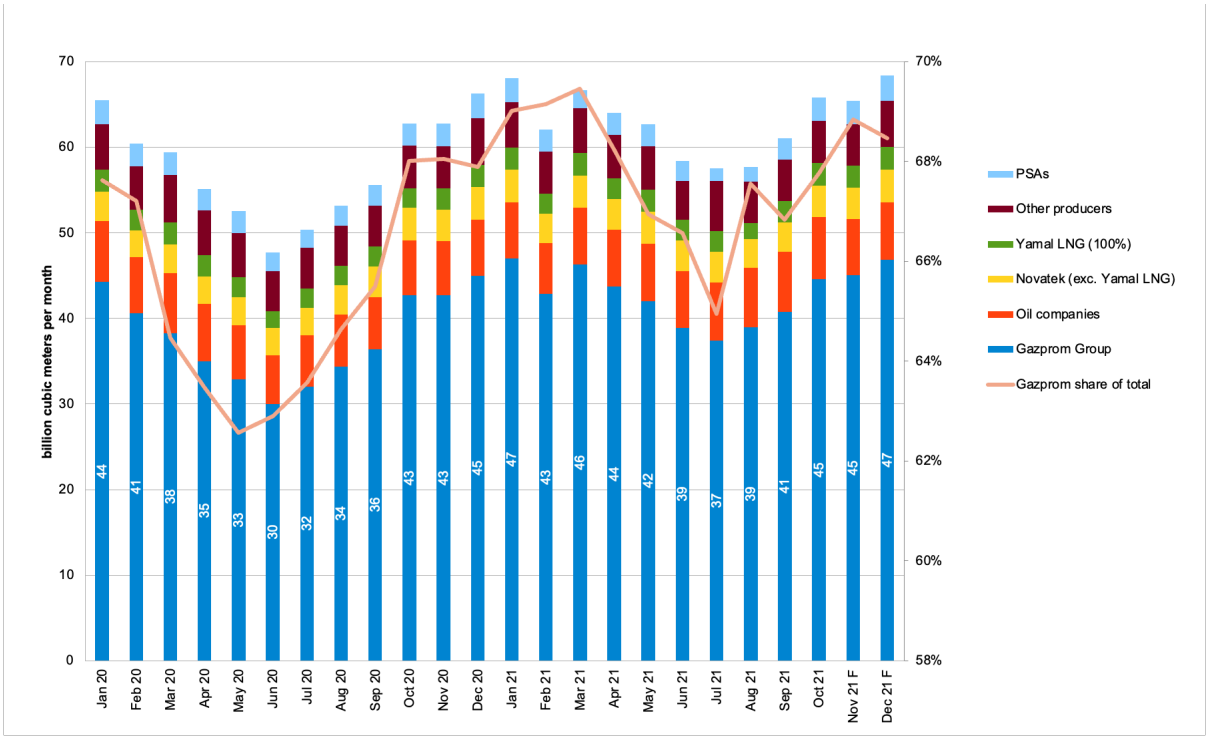
- Gazprom Group output has been up YoY throughout the first ten months of 2021. However, the additional daily output has peaked in June 2021 at 297 mn cubic meters a day, up a third YoY. There was a step down in gas output increases in 3Q21 and again in early 4Q21.

- On August 5, 2021, Gazprom reported a fire at its gas condensate processing facility in Urengoy. The fire significantly reduced its gas exports to Europe via the Yamal-Europe pipeline in August and led to the cancellation of gas condensate shipments[13]. Gas condensate output by Gazprom was down by 51% MoM in August 2021, following the fire. At the same time there seemed to be little impact on Gazprom's natural gas output, which was up 4% MoM to 1,258 mn cubic meters a day in August.

- The company might have managed to compensate for the production loss due to the fire, but the incident might have upset Gazprom's storage injection plans. it might explain highly unusual extension of the gas storage injection period into November.

- The company is still on target to meet its production forecast of over 510 bcm a year in 2021, including production in E. Siberia,

Graph 12. Russian natural and associated gas output, bcm per month



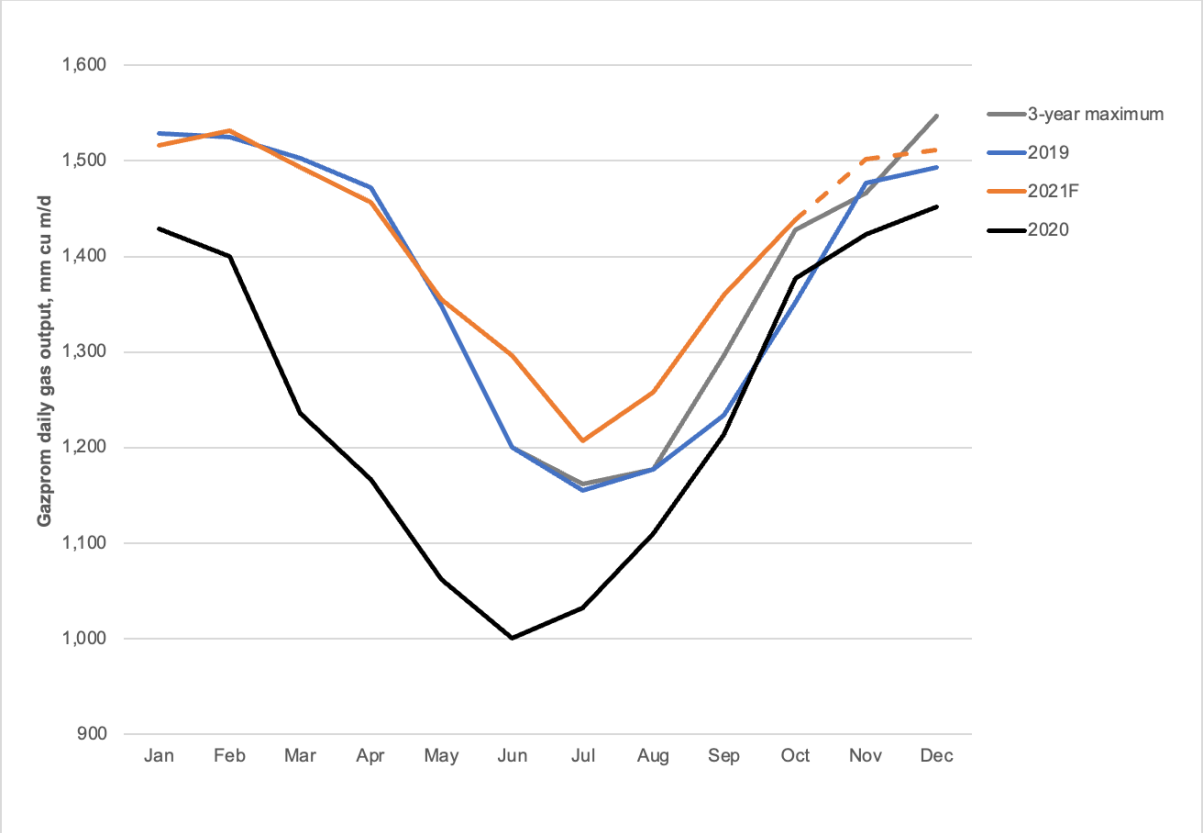
Source: Interfax data, Author's estimate

- The company's domestic gas production usually goes down during the summer months due to lower domestic gas demand and requirement for field and pipeline maintenance. However, in 2021, Russian domestic gas production stayed at unseasonably high levels throughout the summer season. Gazprom kept the output at elevated levels to fill domestic storage, meet domestic demand and fulfil export commitments.

[13] Update 2 – Gazprom cancels Aug condensate exports after Urengoy fire, sources say. Reuters, August 11, 2011

- We forecast Gazprom output at 136 bcm (1,478 mn cu m/d) in 4Q21 compared to 130 bcm (1,413 mn cu m/d) in 4Q20. We currently forecast that Gazprom will hit its production target of over 510bcm for 2021 (500 bcm excluding its Eastern Siberian output), which will match its output in 2019. It is still below its theoretical peak capacity of 550 bcm per year (1,506 mn cu m/d)[14].

  Graph 13. Gazprom Group's monthly gas output and 3-year maximums, mn cu m/d



Source: Interfax data, Gazprom data, Author's estimate

- There might be some spare capacity for Gazprom to increase natural gas output in December 2021 and early in 2022, in our view. However, the company might decide to keep back some of its spare capacity to meet unexpected swings in domestic seasonal demand over the coming winter season. If Gazprom decides to increase exports to Europe (to get closer to the current management export target of 183 bcm for 2021), it will also require Gazprom to fully utilise the Yamal-Europe route and book additional transit capacity via Ukraine in December, according to our estimates.

- Gazprom management believes that the coming winter will be "a good one" for the company, both reasonably cold and relatively long[15]. We assume that the winter gas demand will be at a 5-year average. It could leave Gazprom with fuller YoY storages as of April 2022 and would require lower injections into gas storages in 2Q-3Q22.

[14] Gazprom CEO puts 2020 gas output at 452 Bcm, down 10% after 'challenging' year, 24 Dec 2020, www.spglobal.com

[15] Зампред Газпрома ожидает зиму 2021/22г "холодной, хорошей" для компании, Oct 6, 2021, Interfax

- It could also mean that Gazprom might have spare production capacity throughout 2022 if the NS-2 remains non-operational.

Nord Stream-2 pipeline: ON/OFF scenarios

Table 3. Russian gas balances under NS2-on and NS2-off scenarios, bn cubic meters

	2022F (base)	2022F (NS2-)	Comment on NS2- scenario
Gas supply	**829**	**815**	
Russian gas output, inc.	**753**	**739**	
Gazprom Group output *	507	495	
Gazprom only (exc. G.Neft)	474	464	Down 10 bcm vs base and 18 bcm YoY
Oil companies (inc. G.Neft)	114	114	
All other producers (inc. PSAs)	164	164	
Storage withdrawals	**56**	**56**	Could be much lower if demand weak
Russian storage	49.2	49.2	
European and FSU storage	6.0	6.0	
Other gas, inc. imports from C. Asia	**19.3**	**19.3**	
Pipelines line-pack, other	**1.8**	**1.8**	Balancing amount
	2022F (base)	2022F (NS2-)	Comment on NS-2+ scenario
Gas demand	**829**	**815**	
Gas to Russian customers	**500**	**500**	
Storage injections	**47.9**	**47.9**	
Russian storage	43.0	43.0	
European and FSU storage	**4.9**	**4.9**	
Pipeline line-pack, other usage	**0.1**	**0.1**	
Total gas exports, inc.	**280**	**265**	
Pipeline gas to Europe & Turkey	193	177	Assumes 100% use of Yamal-Europe
To Turkey only *	24	24	Could be higher if market is tight
To Ukraine only **	11	11	Downside risk under NS2- scenario
Pipeline exports to FSU	36	36	
LNG exports	41.2	41.2	
Power of Siberia	11.1	11.1	

Source: Author's estimate. Note: * = reference, ** = re-exports and backhaul to Ukraine

- We have looked at the Russian gas system balances under two scenarios: with and without the launch of the Nord Stream 2 (NS-2) pipeline. Our base case scenario is that the NS2 will be operational in 2022.

- If the NS-2 pipeline does get the regulatory go-ahead in Europe, we expect the capacity ramp-up to be relatively rapid. It is based on the throughput profile of the fist and the second strands of the Nord Stream-1 pipeline.

- We assume that under this scenario the first line of the NS2 pipeline could run at 1 bcm a month (33mn cubic meters a day) by June 2022. The second line then becomes operational in 2Q22 with the same ramp-up profile. Under this best-case scenario (NS2+), both lines of

the pipeline would pump around 2 bcm of Russian gas by end December 2022.

- Under this scenario Gazprom Group will produce 507 bcm of gas in 2021, down 8 bcm YoY. The demand profile for Russian gas, however, is expected to change.

- Total gas demand in the Russian gas system is forecast to drop by around 12 bcm in 2022 (storage injections by 18 bcm YoY and domestic gas consumption by 6 bcm YoY). These volumes will be become available for exports, which will increase 17 bcm YoY, in our estimates.

- Exports flow to Turkey might go down YoY in 2022 compared to the base-case scenario if gas spot prices become more competitive with oil-linked ones. We also assume under this scenario that Ukraine will increase imports of Russian gas (via backhaul and physical reverse exports) to 11 bcm in 2022.

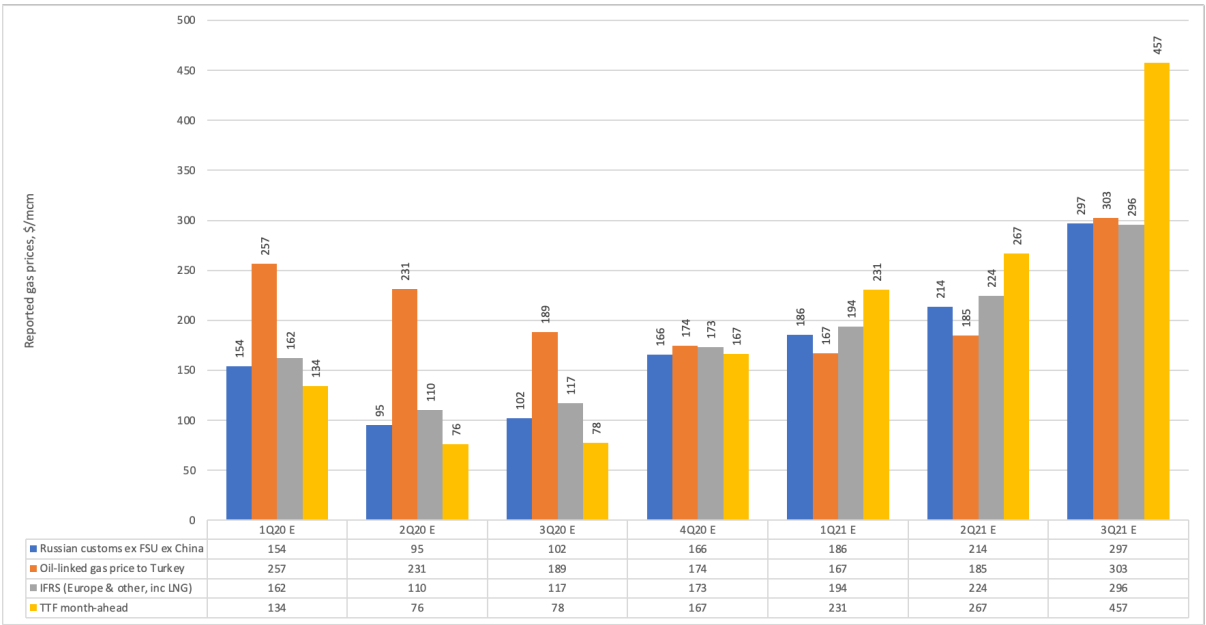
- Gas exports to FSU might go down 2 bcm YoY to 36 bcm in 2022. We forecast that the Russian largest FSU customer will reduce purchases of natural gas from 18.5 bcm in 2021 to 16 bcm in 2022. In October 2021, Belarus put in commercial operation the first block of the Astravets nuclear power station with a capacity of 1,200MWh. It should reduce demand from gas-powered stations by an estimated 2.4 bcm in 2022.

- Under the pessimistic NS-2- scenario gas flows from Russia to Europe (including Turkey and Ukraine) will still rise by 4 bcm YoY in 2022. We would still expect Gazprom to fully utilise the Yamal-Europe pipeline (37 bcm a year) and the 40 bcm a year capacity booked under the December 2019 transit agreement with Ukraine.

- While it is possible that Gazprom will decide to limit export gas flows via the existing transit routes if the NS-2 approval process fails, it would negatively impact the company's operational, financial and credit profiles. It might increase, for example, the cost of finance and might cause substantial reputational damage, in our view.

Gazprom contract prices might remain at a discount to TTF benchmarks in 4Q21

Graph 15. Reported natural gas prices in Europe, USD per 1,000 cubic meters



	1Q20 E	2Q20 E	3Q20 E	4Q20 E	1Q21 E	2Q21 E	3Q21 E
Russian customs ex FSU ex China	154	95	102	166	186	214	297
Oil-linked gas price to Turkey	257	231	189	174	167	185	303
IFRS (Europe & other, inc LNG)	162	110	117	173	194	224	296
TTF month-ahead	134	76	78	167	231	267	457

Source: Author's estimate

- The Russian export gas prices (as reported by the Russian customs and as disclosed in Gazprom IFRS financials) have been rising much more slowly that European gas benchmarks such as TTF futures. The reason for the price drag might be complex. It could be because of oil-linked and hybrid contracts in the portfolio, contracts based on futures prices which are set a month to two months or further ahead, as well as a result of cash hedging of some of the underlying contracts with industrial retail customers in Europe[16].

- The prices for industrial retail customers in Europe (band 14, excluding VAT and recoverable taxes) in 2Q21 were down 9.9% YoY to 2.13 Eurocent/kWh[17]. While the industrial retail price would need to adjust to rising wholesale prices, some of the contracts might be fixed for several years.

- We assume that sales to Turkey and China are based on oil-linked contracts and there are some limited sales under the hybrid contracts, when customers can switch from oil-linked to spot prices. We also assume that the majority of Gazprom exports are linked to month-ahead and other benchmark gas prices. It would correspond to Gazprom's own disclosure that "more than 80% of the [export] volumes delivered have a direct link to different trading hubs indexes including spot and forward markets[18]".

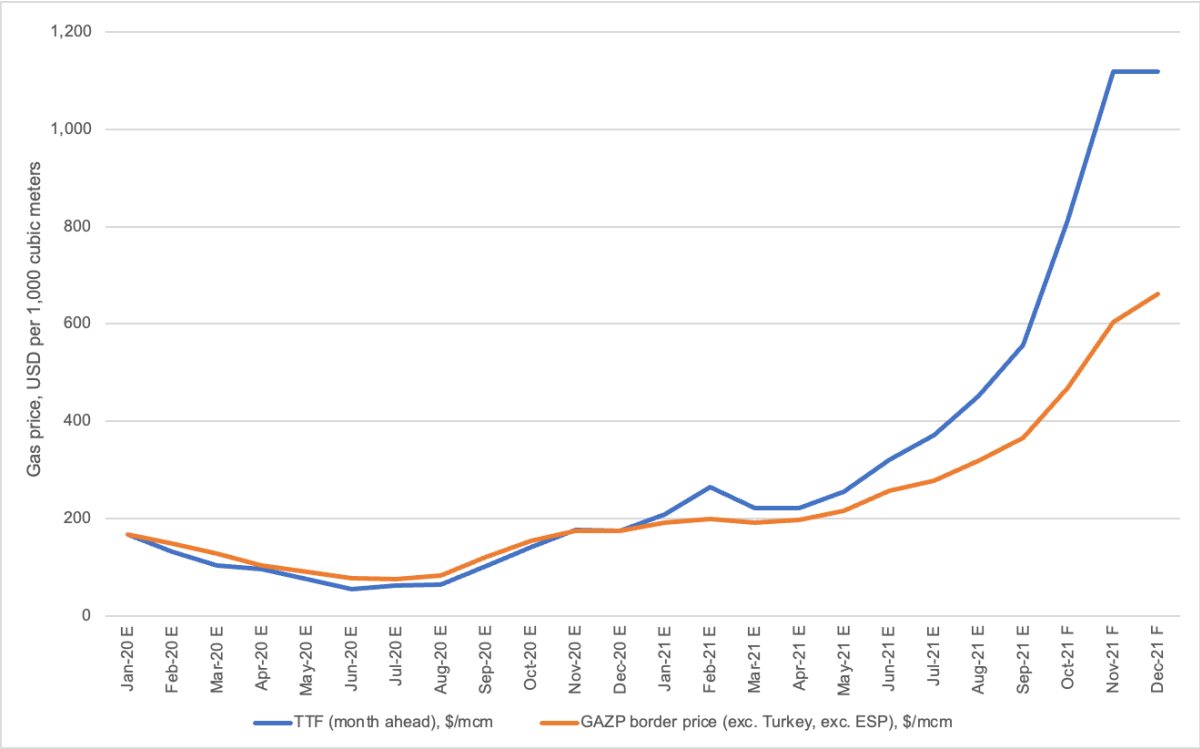
[16] Consolidated Financial Statements 2019 by GAZPROM Germania GmbH

[17] Quarterly Report on European Gas Markets, Volume 14, issue 2, second quarter of 2021

[18] Gazprom investor day presentation 2021 pp. 34, Gazprom Group

- Our estimates of the Russian border export prices to Europe are based on TTF benchmarks, export data published by the Russian customs[19] and our view on the composition of Gazprom export portfolio.

Graph 16. Estimated gas prices at Russian border* and TTF futures, USD per 1,000 cubic meters



Source: Author's estimate. *Note: Futures prices for November and December contracts are as of November 19, 2021.Note: * = border price excluding China, Turkey, ESP and FSU volumes*

- The adjusted price for the Russian-origin gas to European countries (excluding FSU and Turkey) is estimated at $460/'000 cubic meters for September 2021. This is at an est. 42% discount to TTF month-ahead benchmark (October 2021 contract).

- Based on our model, the total value of Russian-origin gas (Russian gas exports to Europe, Turkey and the FSU) was $5.3bn and a total volume of 14.1bcm in October 2021. It means that the weighted average price for Russian-origin gas to all destinations excluding China (comparable to values published by the Russian customs) was $407/'000 cubic meters in October 2021.

- Based on our model and prices of TTF gas futures for November 2021 and December 2021 (as of November 19, 2021), Gazprom export prices to Europe (including Turkey) would average $500/mcm in 4Q21. It would take the average annual price for Gazprom pipeline exports to

[19] The Russian customs shows total volume and aggregate value of the Russian-origin natural gas exported each month across the Russian border to all destinations, including the FSU, but initially excluding China (which is reported with a significant delay). The statistics are published by the Russian customs approximately 5 weeks after the month end.

Europe and Turkey to $300/mcm, within the company's own forecast range of $295-$330/mcm[20] for 2021.

- Equity investors and bond holders might look at another gas price benchmark: weighted average gas prices reported by Gazprom in its quarterly consolidated IFRS accounts. Gazprom reports total gas exports, including exports of Russian-origin and Central Asian-origin gas, sales from gas storages, LNG sales, and sales to industrial retail customers in Europe. We estimate that export price to Europe and other foreign countries (inc. LNG) under IFRS accounts was $306/'000 cubic meters in 3Q21.

[20] Газпром увеличивает оценку цены экспорта газа в дальнее зарубежье в 2021г с $270 до $295-330 за тыс. куб.м, Oct 8, 2021, Interfax

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