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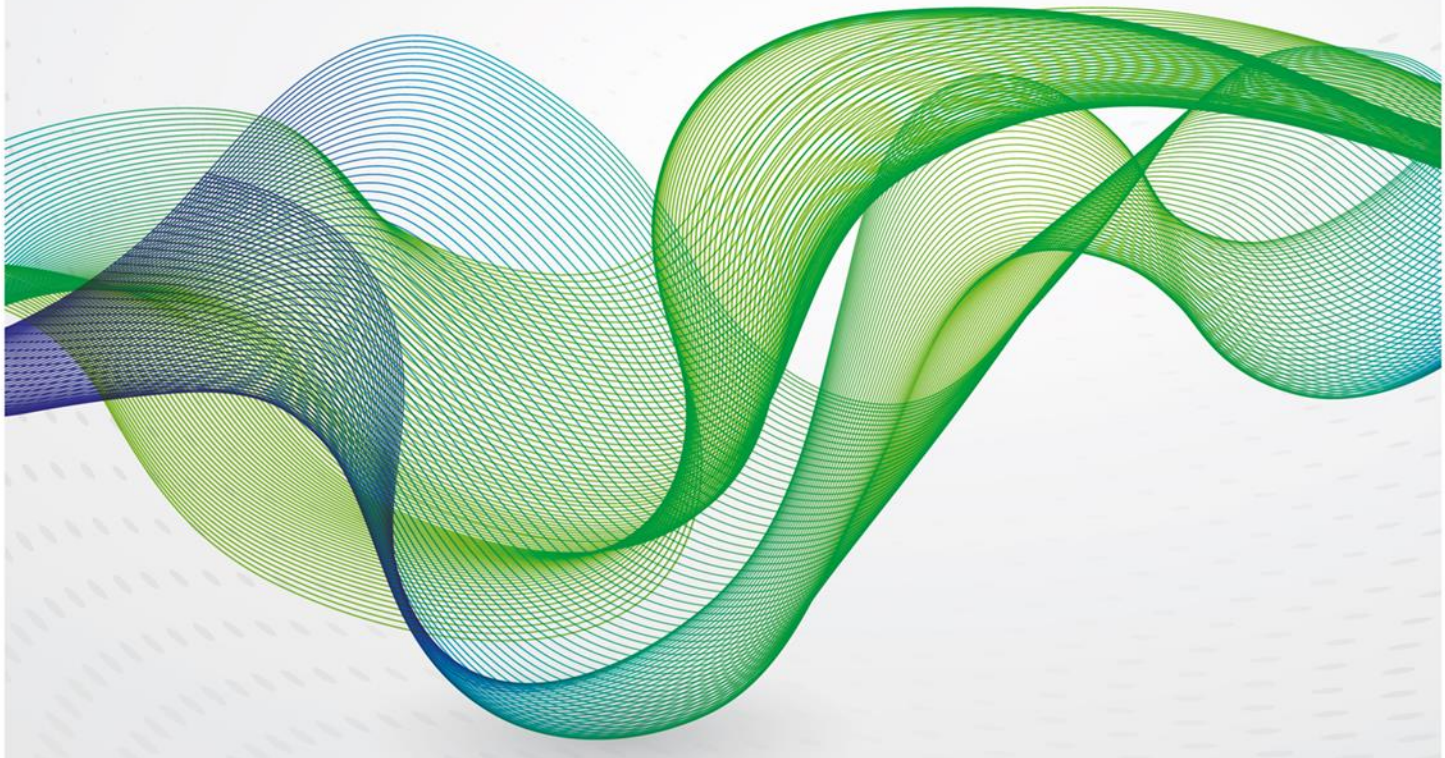
Ukraine Invasion: What This Means for the European Gas Market



OXFORD ENERGY COMMENT

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Key Highlights

- The invasion of Ukraine by Russian forces has led to sharp rises in gas prices in Europe and around the world with real concerns about the possible curtailment of gas flows from Russia to Europe.
- Pipeline imports from Russia began falling in the last quarter of 2021 and declined even further in January and most of February. Gazprom are seemingly only meeting the nominations under long-term contracts and not offering any volumes on their Electronic Sales Platforms. European buyers significantly reduced their nominations in January, and most of February, as the monthly prices under their contracts with Gazprom were much higher than the day-ahead hub prices, reducing the incentive to take contract volumes. As soon as the invasion began, day-ahead prices jumped sharply making the price under the monthly contracts look very attractive. As a consequence, European buyers increased their nominations, especially on the Ukraine route.
- LNG imports into Europe have surged in the last three months, but they largely offset the lower Russian flows in the same period so overall supply to the market was relatively stable, hence the firm prices in the market.
- As a consequence, pressure on gas storage stocks was maintained and the poor injection rates in the summer of 2021 meant that stocks are at historically low levels, although not as low as they might have been if there had been a cold winter.
- Under a scenario where Russia flows on Nord Stream 1, the Yamal-Europe pipeline, and the Ukraine routes are stopped for the period between 1 April 2022 and 31 March 2023, the ability of Europe to refill its storage is severely compromised. Europe might just about be able to get through the summer by emptying what remains of its stocks in storage, but that would lead to significant demand destruction in the winter. In the absence of any mitigation measure some 40 per cent of Central and Western Europe winter demand could be lost.
- There is the potential for some mitigation, through diversions of LNG to Europe from other countries, more production from Groningen in the Netherlands and additional pipeline imports from Norway, North Africa and Azerbaijan. Together with some demand side responses, including more nuclear power, as suggested in the IEA's Ten Point Plan[1], these could maybe reduce the impact by half, but this still leaves a substantial amount of unmet demand in the power and industrial sectors, if the heating load is to be protected.
- While the impact of shortages would mainly be felt in Central and Western Europe, gas prices would clearly be extremely high, leading to further large increases in end-users bills all over Europe and in many other countries around the world which rely on imported gas.

[1] https://www.iea.org/reports/a-10-point-plan-to-reduce-the-european-unions-reliance-on-russian-natural-gas

Introduction

On the evening of Sunday 21 February 2022, the Russian government officially recognized the declarations of independence made by the separatist 'people's republics' of Donetsk and Luhansk, in the Donbas region of Eastern Ukraine. In the days that followed, Russia moved troops into the separatist areas and international commodities markets braced for the prospect of war. On the morning of 24 February, the Russian invasion of Ukraine began.

Gas prices in Europe and around the world have jumped sharply following the invasion. The rises seem to be driven by the market seeing a high probability of the partial or full curtailment of flows of gas from Russia into the European market, specifically along the Nord Stream 1, Yamal-Europe and Ukrainian transit routes. In our most recent quarterly review[2], published at the beginning of February, we assessed what might happen if there was a full or partial curtailment of flows along those routes. A full curtailment, beginning in March 2022, would raise the prospect of significant demand destruction this year, if the curtailment were prolonged for the whole year. The more detailed monthly analysis below confirms the earlier analysis and highlights the possibility of particularly devastating gas demand destruction as we enter next winter, with the potential for mass closures of industry in Central and Western Europe[3] and for blackouts as gas-fired power plants are unable to operate and, if alternative power sources, even coal, are not able to cover the shortfall.

This Comment considers the current status of flows from Russia, the surge in LNG imports into Europe, the role of contract nominations before considering possible scenarios in relation to the curtailment of flows.

A brief overview of Europe's gas supplies

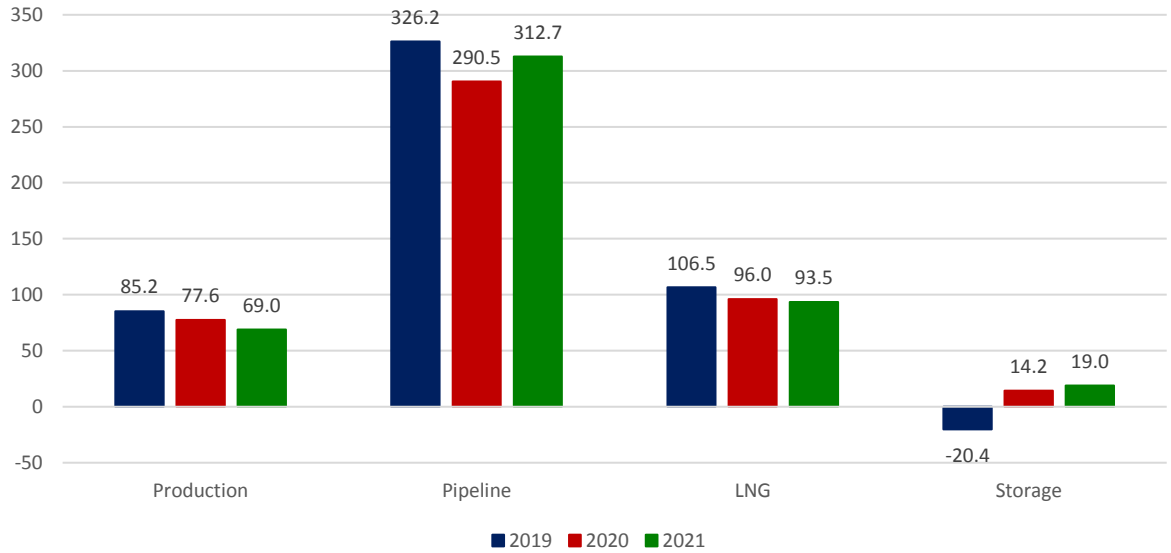
In three of the five years between 2017 and 2021, total gas consumption in Europe (EU-27 plus the UK) was roughly 495 billion cubic metres (Bcm), falling to 482 Bcm in 2018 and 478 Bcm in 2020. These figures are estimated based on the total volume of natural gas produced in Europe, imported into the market in the form of pipeline gas or liquefied natural gas (LNG), and injected into or withdrawn from storage facilities. As Figure 1 (below) illustrates, Europe is highly dependent on imports to meet its gas needs. In 2021, if storage is set aside, production provided around 15 per cent of European supply and imports the remaining 85 per cent.

Because a significant proportion of European gas demand is from space heating, it is strongly seasonal. Therefore, gas is injected into storage during the summer months and withdrawn during the winter months, as gas demand fluctuates more strongly than gas supply on a seasonal basis. Furthermore, injections into storage can absorb excess from an oversupplied market in one year, and release those volumes back onto the market the following year, when the supply-demand balance is tighter.

[2] https://www.oxfordenergy.org/wpcms/wp-content/uploads/2022/02/Gas-Quarterly-Review-Issue-16.pdf

[3] Austria, Belgium, Czech Republic, Denmark, France, Germany, Hungary, Italy, Luxembourg, Netherland, Poland, Slovak Republic, Slovenia, Sweden, Switzerland

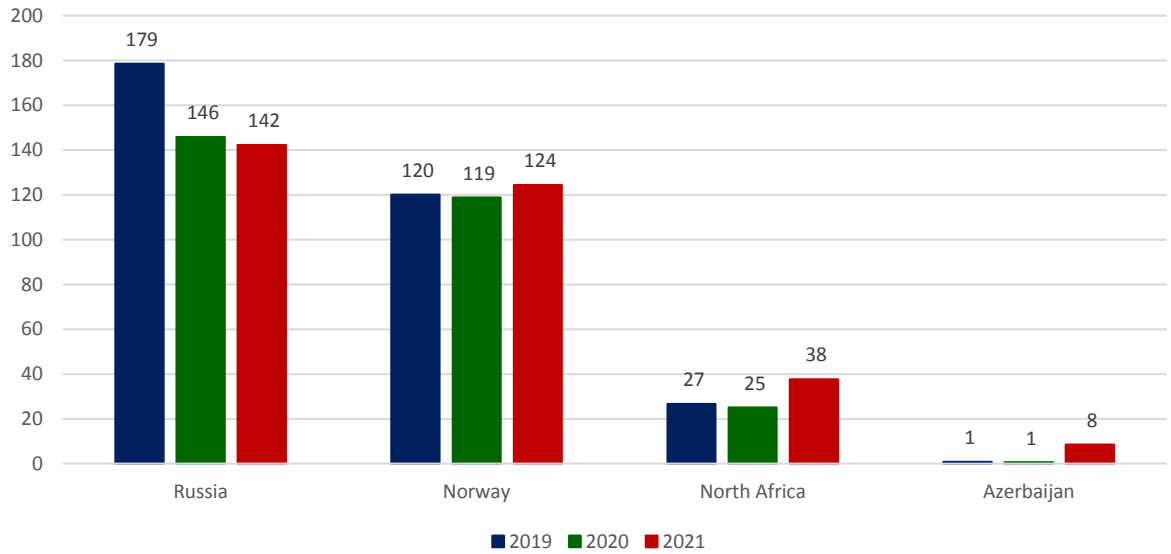
Figure 1: Gas supply to Europe (EU-27 plus UK) by source, Bcm per year



Source: Data from ENTSOG Transparency Platform, Eurostat, Gas Infrastructure Europe, and Kpler. Graph by the authors

The crucial point here is that pipeline imports account for the largest share of European supply and are greater than production and LNG imports combined. Therefore, the question of the origin of those pipeline imports is of great importance for European security of supply. In 2019, Gazprom set a new record for its pipeline gas exports to Europe, supplying 179 Bcm (55 per cent of total European pipeline imports and 36 per cent of total European supply in that year). As Figure 2 illustrates, Europe's pipeline imports from Russia declined in 2020. This was primarily due to a decline in European gas demand related to the COVID-19 pandemic. Despite a year-on-year increase in Russian supplies to Europe in Q1-Q3 2021, a sharp decline in those flows in Q4-2021 was sufficient for total Russian pipeline supplies to Europe to exhibit a further four Bcm year-on-year decline for 2021 as a whole.

Figure 2: European pipeline gas imports by source, Bcm per year

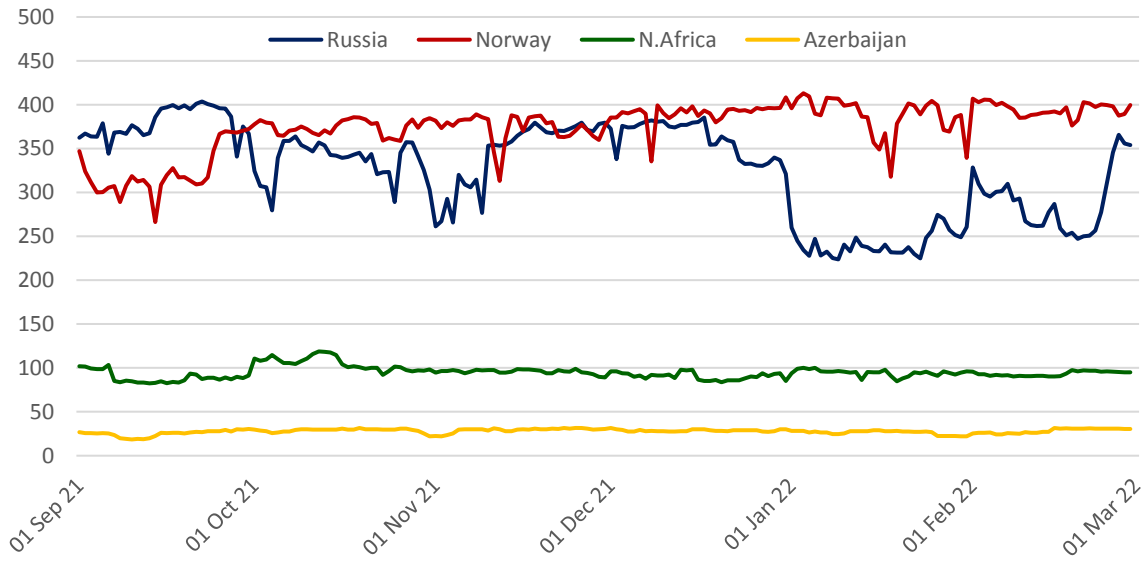


Source: Data from the ENTSOG Transparency Platform. Graph by the authors

Daily pipeline flows to Europe

An examination of the daily pipeline gas flows into Europe from the different suppliers in Q4 2021 and Q1 2022 highlights the dramatic decline in daily flows from Russia from 1 January 2022 (Figure 3). In January, total Russian pipeline flows to Europe averaged around 240 million cubic metres per day (MMcm/d), rising to 290 MMcm/d in February. In late February, these volumes ramped up, from 277 MMcm on 23 February to 355-365 MMcm/d in the last three days of that month. This was close to the monthly average of 360 MMcm/d seen in December 2021. However, as noted below, the December 2021 levels were somewhat lower than the flows in the first nine months of 2021.

Figure 3: European pipeline gas imports by source, MMcm per day



Source: Data from the ENTSOG Transparency Platform. Graph by the authors

In contrast with the dynamics of Russian pipeline flows to Europe, flows from Norway, North Africa, and Azerbaijan remained stable. It appears that these exports are flowing at effectively full capacity. For example, Norwegian pipeline flows to North-Western continental Europe (France, Belgium, the Netherlands, and Germany) were consistently close to the combined nameplate capacities of the relevant pipelines (around 261 MMcm/d) for several months prior to late February 2022, and especially from early January. In a market that was already tight, the only pipeline supplies with any potential for increase were those from Russia.

Russian pipeline gas is delivered to the European market by five main routes: The Nord Stream pipeline, deliveries to Poland and Germany via Belarus,[4] deliveries to Central Europe via Ukraine, deliveries to South-Eastern Europe via the Turkish Stream pipeline and transit to the Turkey-Bulgaria border.[5] Residual volumes are delivered directly across the Russian border to Finland, Estonia, Latvia, and Lithuania.[6]

[4] This is primarily via the Yamal-Europe pipeline, from the Belarus-Poland border at Kondratki to the Poland-Germany border at Mallnow. Much smaller volumes are also supplied to the Polish market via the Wysokoje cross-border interconnection on the Belarus-Poland border

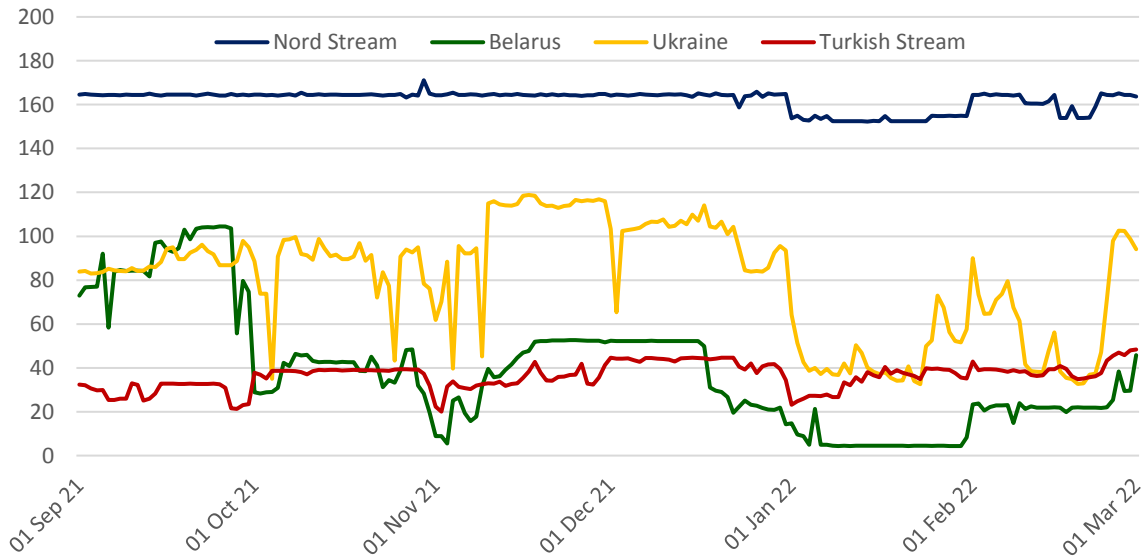
[5] This route provides Russian gas to Bulgaria, Greece, North Macedonia, Serbia, and Hungary. Gas supplied to the Turkish market via Turkish Stream is excluded from this analysis

[6] Deliveries to Lithuania include volumes for onward transit to the Russian enclave of Kaliningrad. In this analysis, the volumes delivered on to Kaliningrad are subtracted from the volumes delivered to Lithuania

In terms of daily capacity, the Nord Stream pipeline is capable of delivering 165 MMcm/d, while the Belarusian route 114 MMcm/d (of which 98 MMcm/d is on the Yamal-Europe pipeline at Kondratki and 16 MMcm/d at the smaller connection at Wysokoje). The Turkish Stream route has just under 54 MMcm/d of capacity on the Turkey-Bulgaria border. Gazprom and the Ukrainian pipeline system operator, GTSOU, have a long-term transit contract for 110 MMcm/d of capacity, although GTSOU also regularly offers a further 15 MMcm/d of capacity at auction. Theoretically, these main routes offer 443 MMcm/d of capacity, and 458 MMcm/d if the additional auctioned Ukrainian capacity is included.

As Figure 4 shows, the Nord Stream pipeline continued to operate at full capacity in the last four months of 2021, with the Belarusian route providing the downward flexibility for deliveries to North-Western Europe. In January 2022, both routes saw a decrease in flows, and a subsequent recovery in February. Deliveries via Turkish Stream to South-Eastern Europe and Hungary remained broadly stable. The most dramatic fluctuation was in gas deliveries via Ukraine, which fell to around 40 MMcm/d at the beginning of January, recovered at the end of January, fell again on 11 February, and then rose substantially from 24 February onwards (the first day of the invasion).

Figure 4: Russian pipeline gas supplies to Europe by route, MMcm per day



Source: Data from the ENTSOG Transparency Platform. Graph by the authors

Between 1 January 2017 and 31 December 2019, monthly average daily Russian pipeline supplies to Europe averaged 473 MMcm/d, ranging from 406 MMcm/d to 534 MMcm/d. Setting aside the impact of the first wave of the COVID-19 pandemic (Q1-Q3 2020), Russian pipeline supplies to Europe averaged 434 MMcm/d from October 2020 to June 2021, with the monthly average ranging from 404 to 471 MMcm/d. In the period July to December 2021, the average fell to 360 MMcm/d, with the monthly averages ranging from 336 MMcm/d to 381 MMcm/d. Therefore, the supply of 240 MMcm/d in January 2022 was just over half the monthly average for the three years between 2017 and 2019.

These numbers matter because they highlight the extent to which Russian pipeline supply to the European market was curtailed even before the Russian invasion of Ukraine. The European market is already in a situation where non-Russian pipeline supplies are at maximum capacity. If Russian supply is curtailed – either partially or completely – from its already lower-than-usual level, Europe will have to turn to other non-pipeline sources: namely LNG imports, its own production, and storage withdrawals, potentially also combined with demand-side management.

LNG to Europe

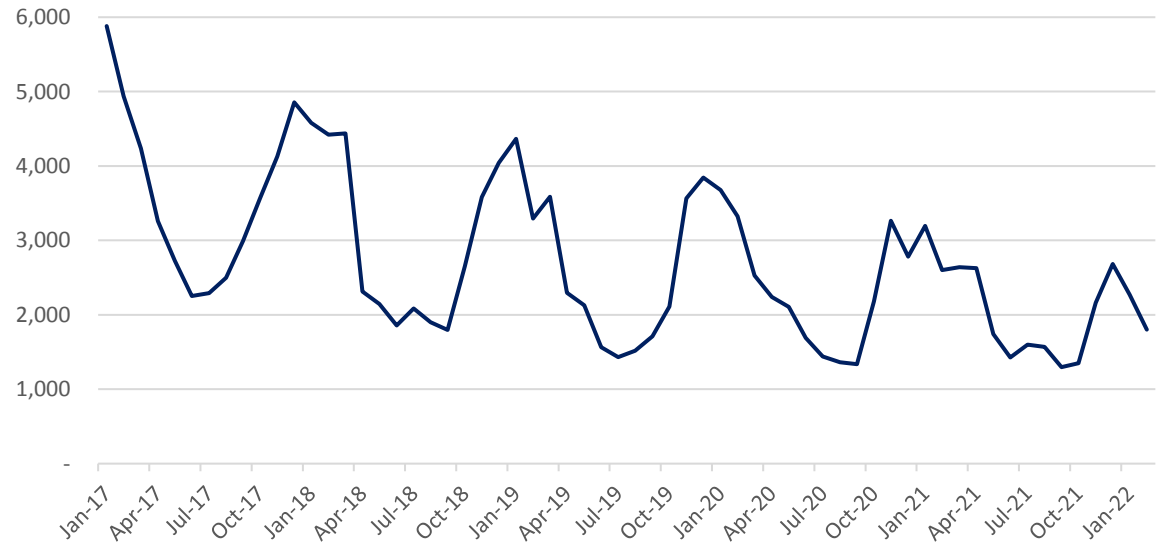
LNG has already been flooding into Europe in the last three months (December 2021 to February 2022). Compared to the same period in the previous year, when large volumes of LNG were diverted to Asia, LNG imports are up by some 18 Bcm. Part of this extra supply is due to diversion of cargoes from Asia, where LNG imports were lower by some 11.5 Bcm, but overall LNG trade was also up by around 6.5 Bcm.

In the first two months of 2022, LNG imports into Europe were equivalent to some 490 MMcm/d, up from 370 MMcm/d in the final quarter of 2021. This increase played a key role in helping to offset a fall of some 100 MMcm/d imports from Russia, but it should be noted that global LNG supply is now at a record level which would be unsustainable on a year-round level.

Other supply: production and storage

European gas production is in long-term decline. The Netherlands accounts for roughly half of EU-27 gas production, and between 2017 and 2021, gas production in both the Netherlands and the rest of the EU declined at approximately the same rate. As a result, EU-27 gas production declined from 83 Bcm in 2017 to 51 Bcm in 2021. Outside the EU-27, UK net gas production[7] declined slowly from 39 Bcm in 2017 to 36 Bcm in 2020, followed by a dip to an estimated 29 Bcm in 2021 due to maintenance held over from 2020.[8] Although UK production is set to rebound in 2022, the overall picture is of an ongoing decline in both annual production volumes and seasonal 'swing' (the ability to raise production in winter to meet higher demand and lower production in summer, also in line with lower seasonal demand). This leads to the conclusion that, in the event of a curtailment of Russian pipeline supplies to Europe, production cannot ramp up to any meaningful extent to offset the loss of the Russian supplies.

Figure 5: European gas production, MMcm per month



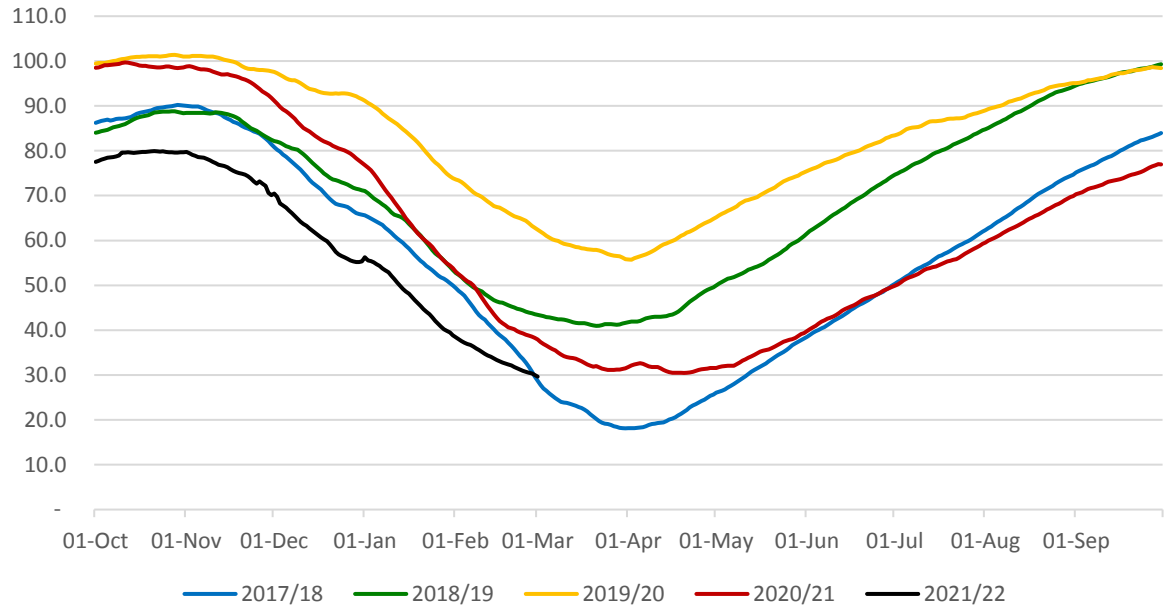
Source: Data from ENTSOG Transparency Platform and Eurostat. Graph by the authors

[7] Gross gas production minus producers' own use

[8] Here it should be noted that the data from ENTSOG does not distinguish between UK production and pipeline imports from Norway that are brought ashore at Easington and St Fergus. Both are assigned as pipeline imports from Norway, which leaves the annual figures for European production in the analysis above around 15 Bcm/y lower and pipeline imports from Norway around 15 Bcm/y higher than they are in reality.

The topic of gas storage has been prominent in discussions of European gas-related energy security. In Europe as a whole, there is the capacity to hold around 100 Bcm of storage stocks, which is equivalent to one-fifth of annual demand. At the start of winter 2021/22, European storage stocks were around 10 per cent lower than would have been expected in a 'normal' year. However, a mild winter and related slower storage withdrawals have meant that European storage stocks on 28 February were similar in volume to those held on 28 February in 2017 and 2018, although still significantly lower than stocks held on 28 February in 2019-2021. As a result, the ability to withstand any curtailment of Russian flows through drawing down on storage is limited as discussed below

Figure 6: European gas storage stocks, Bcm



Source: Data from Gas Infrastructure Europe Aggregated Gas Storage Inventory (GIE ASGI+)

Prices and contracts: Why did pipeline imports from Russia increase after the invasion began?

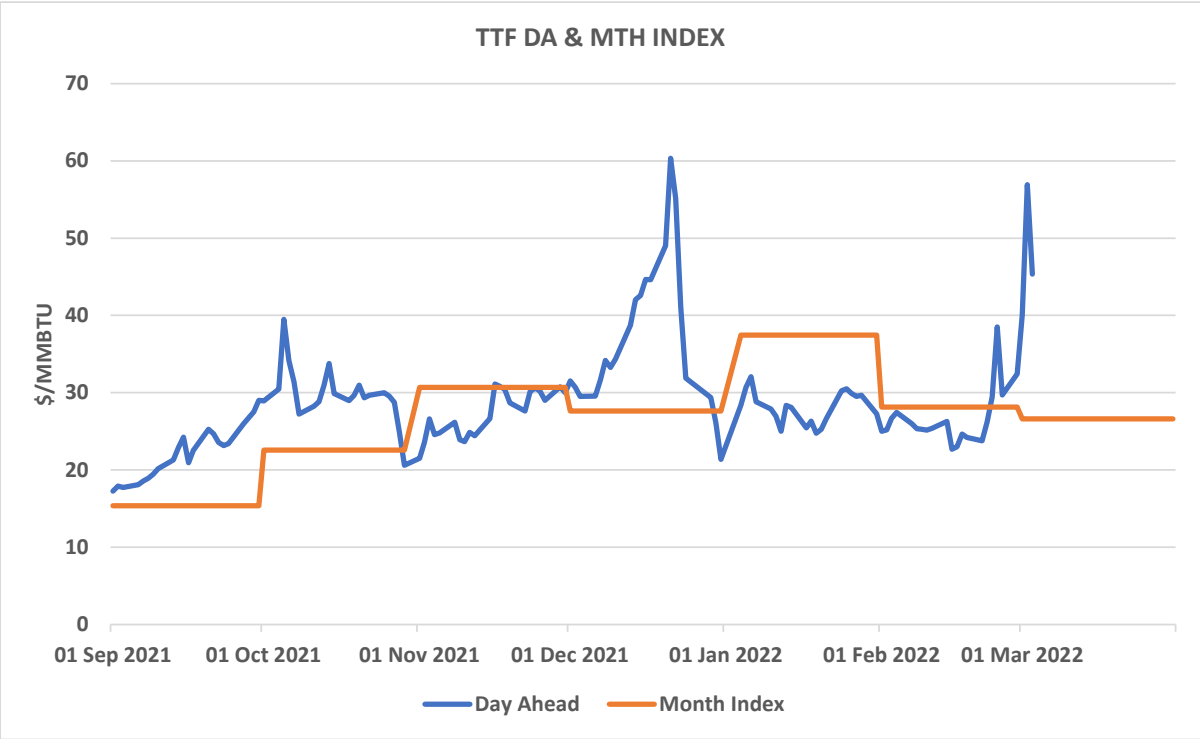
The sharp increase in prices as the invasion started would seem to be pricing in at least a partial curtailment of gas flows from Russia. Paradoxically, flows from Russia, especially via Ukraine picked up significantly almost as soon as the invasion began. This would seem to reflect higher nominations under some of the long-term contracts. Figure 7 suggests why this might be the case.

It is thought that at least some of the contracts European buyers have with Gazprom are priced on the monthly index – known as Month+1 or 'Front-Month' – with the price being determined prior to the month of delivery beginning. Until the end of 2021, the Day Ahead price was largely higher than the Month Index[9], so there was an incentive to nominate under the contracts rather than buy on the day ahead market. This changed significantly in January (and, to a lesser extent, in the first three weeks of February) as the Month Index was priced above the Day Ahead price, leaving a much lower incentive to nominate contract volumes, instead buying day ahead or taking gas out of storage. This was reflected in the sharp fall in flows from Russia in January and February. However, the pricing dynamics have

[9] The rising day ahead prices were reflecting the tightening market and this impacts the month ahead index as well, so day ahead prices tend to 'lead' the month ahead price. As day ahead prices start to weaken, they 'lead' the month ahead price down, so in January the month ahead reflected trades in December and the weakening market pulled the day ahead price below the monthly price

now reversed, with the Month Index below the Day Ahead price and it would appear as a result that contract nominations have risen sharply.

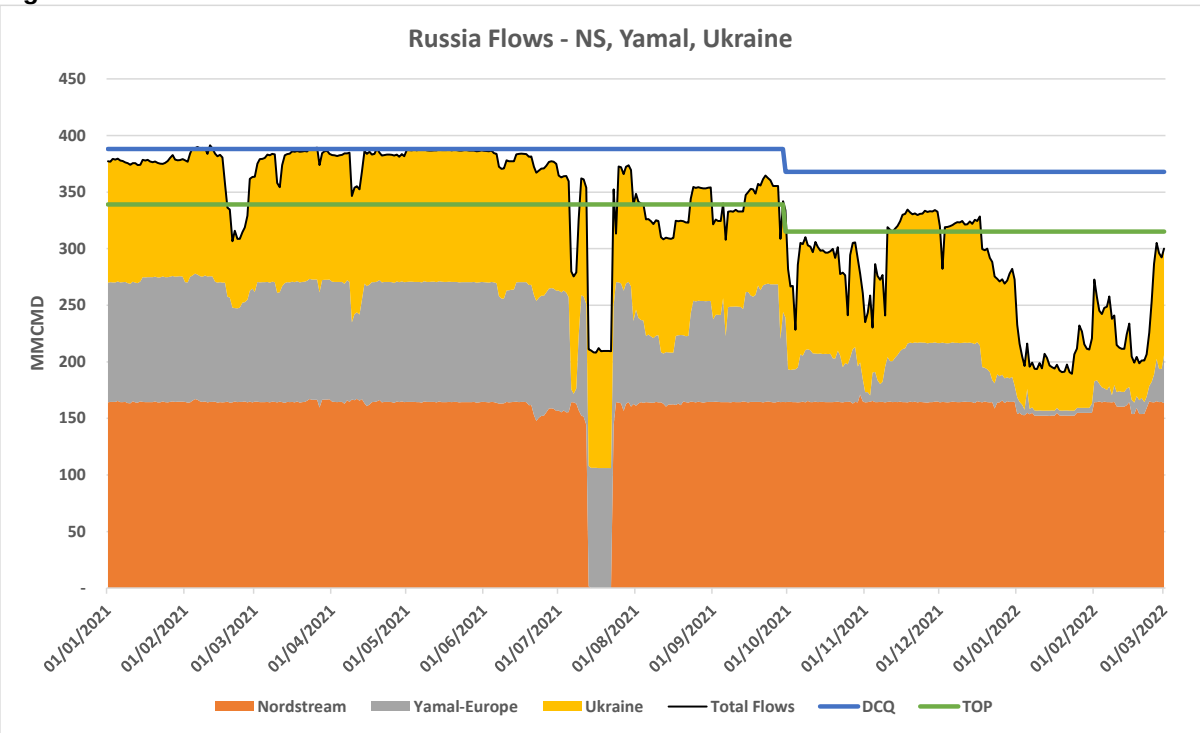
Figure 7: TTF Month Ahead and Day Ahead prices



Source: Argus Media

Flows, however, are still running below our estimates of the Take-or-Pay (TOP) and Daily Contract Quantities (DCQ) for all contracts for Central and Western Europe countries. It is appropriate for the analysis here to narrow to the countries of Central and Western Europe, as these are the countries that buy their Russian gas under contracts with hub-linked prices. By contrast, it appears that long-term sales contracts in South-Eastern Europe (Bulgaria, Serbia, North Macedonia, and Greece) are more likely to remain oil-indexed, albeit with regular price revisions. Therefore, we focus the next stage of our analysis on the flows of Russian gas to North-Western Europe (via the Nord Stream and Yamal-Europe pipelines) and Central Europe (via Ukraine). Here, we can compare our estimations of the collective Daily Contract Quantities and Take-or-Pay levels in contracts for delivery of Russian gas to those markets.

Figure 8: Russia flows and contract volumes



Source: ENTSOG, NexantECA World Gas Model, OIES

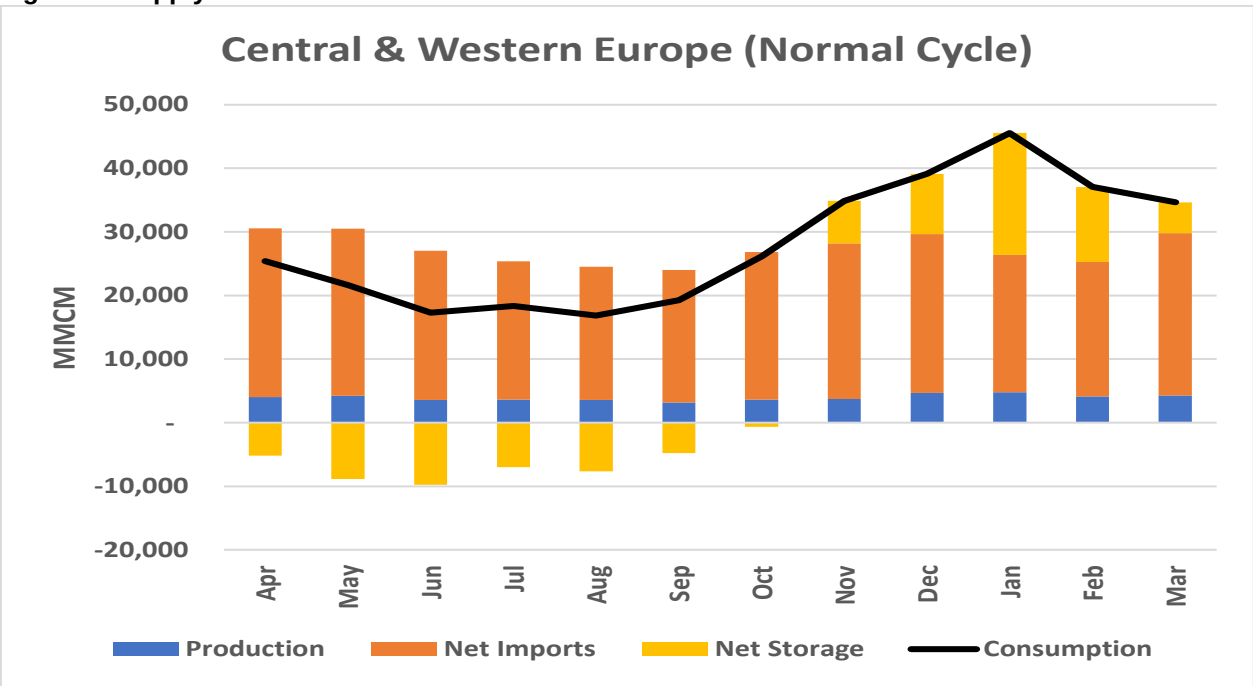
As noted earlier, between 21 and 26 February, the flow of Russian pipeline gas to Europe as a whole (EU+UK) rose by almost 50 per cent. In the same period, total supply to Europe (production plus imports and net storage withdrawals) increased by eight per cent. In Figure 8, the combined flows via the Nord Stream pipeline, Yamal-Europe pipeline, and the Ukrainian transit route are shown and these are now just below the long-term contracts TOP levels.

Without the invasion of Ukraine, which has spooked the market into pricing full or at least partial curtailment of flows into the price, it is highly likely that TTF Day Ahead and Month Ahead prices would have fallen significantly. In January and February both these price series averaged around $27 per MMBtu, with the surge in LNG imports broadly offsetting the decline in pipeline flows from Russia, especially in January. The market has been very sensitive to both slight changes in actual flows and/or expectations of changes in flows. As such, the significant rise in flows from Russia in the last week which contributed to the eight per cent rise in total European supply, might have been expected to lead to a material reduction in TTF prices, in the absence of the invasion of Ukraine – in all probability to prices well below $20 per MMBtu.

Possible curtailment of Russian flows to Europe

The analysis here considers what might happen if Russia flows via Nord **S**tream 1, Yamal**-**Europe and the Ukraine routes are curtailed[10], starting on 1 April 2022 and continuing for a whole year. The supply – demand analysis is conducted for Central and Western Europe only.[11] Figure 9 has taken the average monthly consumption, production and net imports into that region for the last three years. The normal cycle is for supply (production plus net imports) to exceed consumption, with injections into storage between April and September (sometimes into October) and withdrawals between October and March, balancing the market.

Figure 9: Supply-demand balance – normal



Source: IEA, ENTSOG

Compared to the normal cycle, Figure 10 illustrates what might happen if all Russia flows are curtailed from the beginning of April for a whole year. That is Russian imports via Nord Stream 1, Yamal-Europe and all Ukraine routes for April 2020 to March 2021.

Assuming that Russian flows - equivalent to the historic flows between April 2020 and March 2021[12]- are deducted from net imports, there would not be sufficient supply even to meet summer consumption. Rather than injecting into storage, gas would have to be withdrawn in the summer – a total of around 21 Bcm from April to September – which would be likely to leave storage pretty much empty by the beginning of October.[13] The deficit widens dramatically as winter approaches. With no storage left to withdraw to balance higher demand, the deficit would average just over 20 Bcm a month from October to March – around 125 Bcm in total – the same as the lost Russian flows. This would be equivalent to a 40 per cent reduction in gas demand in the winter period, without any mitigation measures. Given the need to protect the space heating load, the burden in the winter would be likely to fall on the power and

[10] Curtailment of flows could be the result of several factors and scenarios but these are outside of the scope of this paper

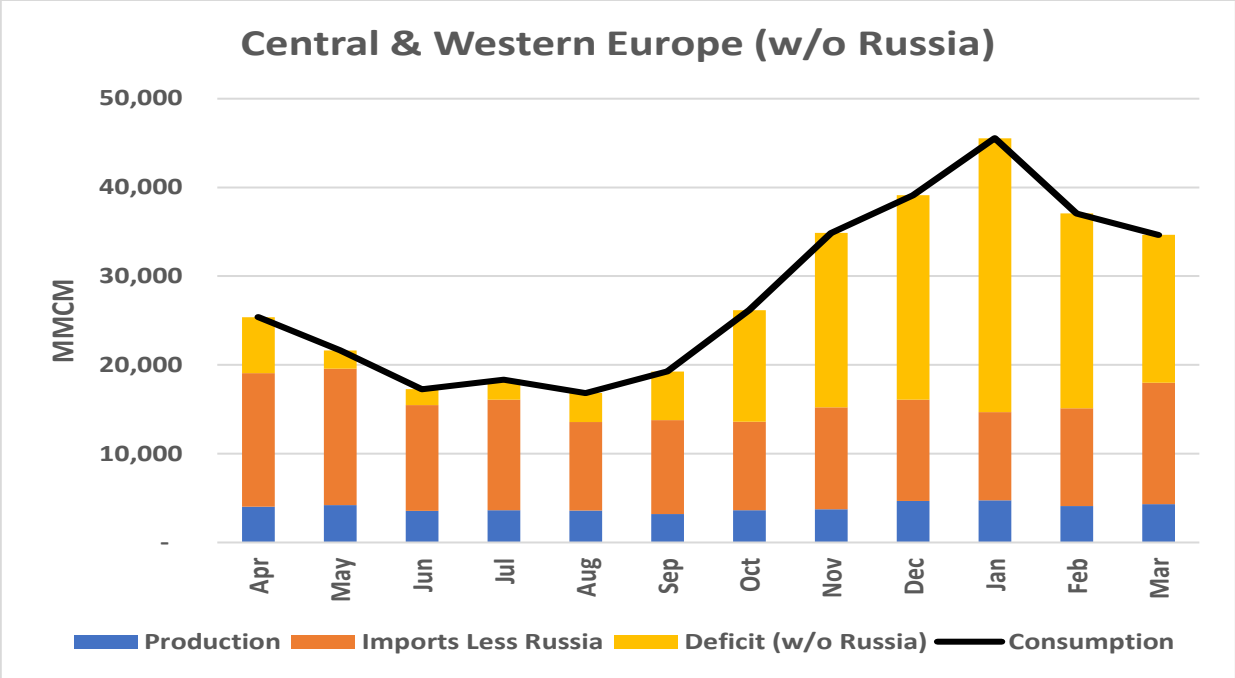
[11] Austria, Belgium, Czech Republic, Denmark, France, Germany, Hungary, Italy, Luxembourg, Netherland, Poland, Slovak Republic, Slovenia, Sweden, Switzerland

[12] A total of 125 Bcm

[13] As at end February 2022 there was some 30 Bcm in total in storage for the whole of Europe (not just Central and Western Europe) and with March withdrawals gas in storage could be close to 20 Bcm by the beginning of April

industry sectors, and although some of the gas could possibly be replaced by coal and oil – if that is available at all to purchase – there would very likely be some industrial closures and power cuts.

Figure 10: Supply-demand balance – no Russia flows



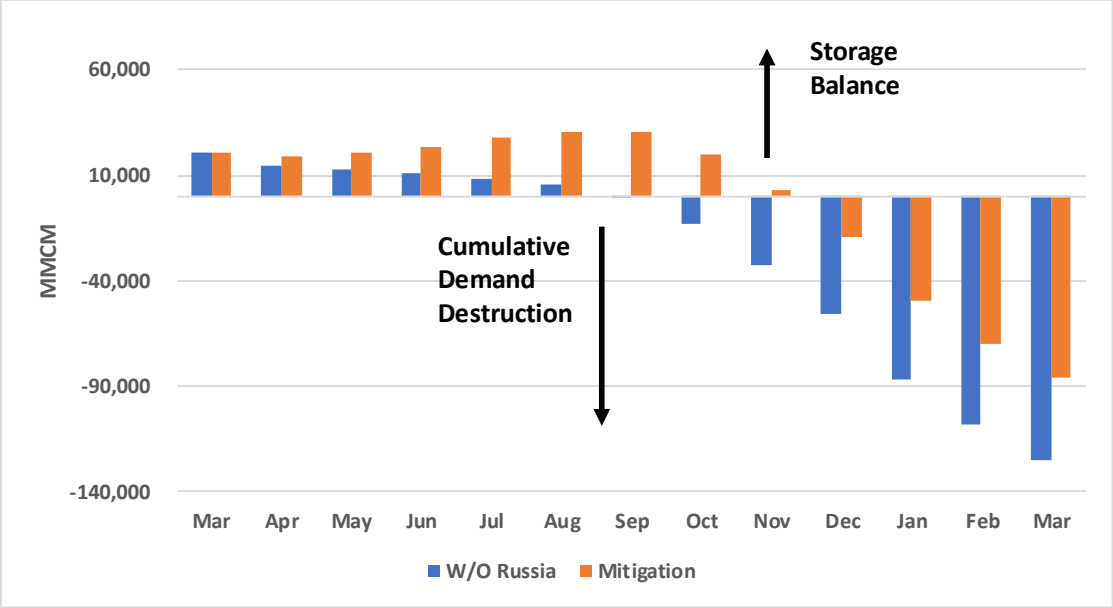
Source: IEA, ENTSOG

As noted in our latest quarterly review, simply reducing demand by the lost Russian flows is not necessarily the expected outcome. There are potential alternative sources of gas supply to partly mitigate the loss of flows.

- While the LNG market is very tight, more LNG could be diverted to Europe, being imported either directly into France, Belgium, Netherland and Italy or via the UK acting as a land bridge. Based on the scenarios from our quarterly review, some 25 Bcm could be diverted from other markets. This would most likely come to Europe in the summer – perhaps four Bcm a month.
- Gas production is somewhat limited in this region, outside the Netherlands, but there has been some discussion of possibly higher production from Groningen, before it closes. Still, this would account for maybe only five Bcm or so in total during 2022.
- Higher pipeline imports from Norway, Algeria and Azerbaijan are also possible, resulting in some 10 Bcm more in the April 2022 to March 2023 period.

In total this could alleviate the shortfall by some 40 Bcm, mostly in the summer, which would help to at least keep storage levels stable or even topping them up a little, in preparation for the winter. The extra 40 Bcm, if realised, would maybe push back the period before large scale demand destruction might occur to early December. Figure 11 illustrates this by taking the cumulative balance remaining in storage, and when that is exhausted, the cumulative reduction in demand required, both for the case where Russia flows stop from 1 April, and also where the balances are mitigated by alternative sources of supply, up to 40 Bcm.

Figure 11: cumulative balances – Central and Western Europe



Source: IEA, ENTSOG, OIES

The cumulative demand shortfall, after the potential alternative sources of supply, is still some 85 Bcm, as opposed to 125 Bcm. The IEA published their Ten Point Plan[14] on reducing the European Union's reliance on Russian gas. The IEA analysis suggested there might be some 30 Bcm of additional gas supply – more pessimistic than our assessment. The IEA also suggested that gas use in power might be reduced by increasing generation from nuclear and bioenergy as well as bringing forward some new renewable projects. This could be the equivalent of some 20 Bcm of gas demand. Using our calculations that would still leave a 'gap' of some 65 Bcm. The IEA also suggested that some demand side measures could reduce the need for energy in buildings, equivalent to maybe 10 to 15 Bcm. That would still leave a shortfall of some 50 Bcm or more, very much concentrated in the peak winter months of December through to March.

Partial curtailment

Rather than a complete curtailment of Russian flows, a partial curtailment is also possible. With the war continuing in Ukraine, pipeline infrastructure could be damaged to such an extent that all transit flows are forced to stop. Over a year as a whole, assuming that the damage cannot be repaired, this would amount to a shortfall of some 40 Bcm – around one-third of the loss of complete curtailment. This could be alleviated in whole or in part by the mitigations noted above, but also by diverting at least some of the lost flows via the Yamal-Europe pipeline which has been running at very low flow rates in the last few months.

It should be noted, however, that, since October, imports from Russia along these routes have been running at 8.5 Bcm a month – and even lower in January and February – as noted earlier. On an annual basis this is some 100 Bcm – 20 per cent lower than the 125 Bcm that flowed between April 2020 and March 2021. These lower Russian flows have already increased the amount of gas that Europe has had to withdraw from storage this winter, putting even more pressure on prices and increasing the volume of gas required to return storage levels to acceptable levels by the start of winter 2022/23. As a result, even if flows from Russia were to go back to January and February levels, the market would

[14] https://www.iea.org/reports/a-10-point-plan-to-reduce-the-european-unions-reliance-on-russian-natural-gas

remain very tight. The large increase in flows in the last week has taken, on a purely physical flow basis, some of the pressure off, but, as noted above, has not led to an easing of prices because of the invasion of Ukraine, and the uncertainty this has caused. A really significant loosening of the market would likely require flows from Russia, along the three main corridors to Central and Western Europe, to return to the levels seen in the first nine months of 2021 – see Figure 9.

Conclusions

Sharply rising gas prices in Europe, following the invasion of Ukraine by Russian forces, would appear to be pricing in full or partial curtailment of Russia pipeline flows into Europe, be it due to the implementation of sanctions on oil, gas and coal imports by the EU or due to Russia deciding to cut flows. Since the invasion began, imports from Russia into Europe have risen sharply by almost 50 per cent, as European buyers increased their nominations under their long-term contracts, reflecting the much lower monthly contract prices than the day ahead prices. Under normal circumstances, such a large increase in supply would have been expected to lead to a sharp downward price correction. It is possible that TTF prices could have fallen to well below $20 per MMBtu, with such a large increase in supply, in the absence of the invasion of Ukraine.

Under a scenario where, for whatever reason, Russian flows to Central and Western Europe are curtailed from 1 April 2022 for a whole year, it might be possible to get through the summer, by drawing down on any remaining storage, but that simply postpones the problem, by leaving storage empty. With no gas in storage to withdraw and no Russian gas, there is a strong likelihood that 40 per cent of gas demand in Central and Western Europe (around 125 Bcm) could be unmet next winter, without any mitigation measures. Additional supply from diverting LNG to Europe, possibly higher Groningen output and additional pipeline imports, could alleviate the shortfall by some 40 Bcm. On the demand side, the IEA suggested that a combination of more nuclear production and bioenergy, bringing forward some renewable projects as well as demand side measures, could replace the equivalent of 30 to 35 Bcm of gas demand. However, that would still leave a shortfall of at least 50 Bcm or more, in the peak winter months of December through to March, with power cuts and industrial closures highly likely.

If a curtailment actually occurred, gas prices would almost certainly spike even higher. That, in turn, would mean that end-consumers of gas and electricity could face the prospect of significantly higher bills than they are already facing this summer. This would even apply to customers in Europe who may not be directly impacted by any shortfall in gas flows from Russia, such as the UK. Furthermore, even if flows from Russia continued at recent levels, the market is still finely balanced and any real easing of this tightness of the market would likely require a return to the higher levels seen in the first nine months of 2021.