

March 2021



Ukraine-EU Gas Market Integration

Short-Term Progress, Long-Term Challenges

Introduction

Ukrainian gas storage has played a big role in balancing central and eastern European markets for the second winter running.¹ Of 28.1 bcm stored in Ukraine on 1 November, 11.2 bcm was in the ‘customs warehouse’ that is effectively integrated into the European market.^{2 3} Between 1 November and 1 March, a little more than 10 bcm was withdrawn from storage (including 5 bcm from the ‘customs warehouse’), either for sale in Ukraine or for repatriation to neighbouring European markets.⁴ All this counts as a strategic success for the TSO, Gas Transmission System Operator of Ukraine (GTSOU), which has offered a discounted ‘short haul’ transportation service and strengthened cross-border interconnections, and Ukrtransgaz, which manages storage and has implemented the ‘customs warehouse’ storage regime. The key impetus for Ukrainian companies’ activity in these areas has been the long-term decline of the transit business. While total transit volumes in January-February 2021 were slightly up year on year (6.8 bcm, from 6.5 bcm), total transit volumes in 2020 were reported by GTSOU at 55.8 bcm, down from 89.6 bcm in 2019, 78.4 bcm average in 2014-18 and 107.6 bcm average in 2004-13.⁵ Here it is worth recalling that under the current Russia-Ukraine transit agreement, Gazprom pre-booked 65 bcm of Ukrainian transit capacity for 2020, and 40 bcma for 2021-2024, meaning that Ukrainian transit is almost certain to fall year-on-year in 2021, and further still if Nord Stream 2 and the Turkish Stream extension through Serbia to Hungary are completed and brought into operation.

In this paper, we assess the changes made and the impact on markets in Central and Eastern Europe (CEE), and then consider what difference these changes make to Ukrainian integration into the European gas market overall. We highlight other factors that could frustrate the process, including the slow pace of institutional reform in Ukraine, the geographical and commercial constraints on aspects of market integration in CEE, and the likely future decline of Ukraine’s transit business.

¹ We are grateful to the many market participants and observers who have discussed the issues with us, and especially to Paul Martin of Argus for his help and to Argus for data. We also thank our colleagues Patrick Heather and James Henderson for their comments. Any errors are the authors’ responsibility.

² Ukrtransgaz, 2020. *Press Release*, 17 November. <http://utg.ua/en/utg/media/news/2020/in-october-the-filling-level-of-ukrainian-ugs-reached-28.3-bcm-which-will-be-a-stabilizing-factor-in-the-heating-season.html> - Of that 11.2 bcm, 10 bcm was held by non-resident traders. Of that 10 bcm, 5.8 bcm had been imported under the ‘short-haul’ tariff regime during 2020.

³ Since 17 September 2020, Ukrtransgaz has reported its storage stocks to the Gas Infrastructure Europe (GIE) Aggregated Gas Storage Inventory (AGSI+) without the inclusion of cushion gas (4.662 bcm at a GCV of 10.444 kWh/m³). However, in its monthly press releases announcing storage stocks, Ukrtransgaz continues to include cushion gas in its figures. To maintain consistency, we have added the cushion gas to the AGSI figures as portrayed in Figs 1 & 2, so that they are consistent with Fig. 3, which is based on data from the Ukrtransgaz press releases.

⁴ Ukrtransgaz, 2021. *Press Release*, 3 March. <http://utg.ua/en/utg/media/news/2021/frosty-february-almost-3-bcm-of-gas-were-taken-from-ukrainian-ugs.-this-is-2.5-times-more-than-last-year.html> - By 1 March, the volume held in the Customs Warehouse had fallen to 6.15 bcm, of which 5.6 bcm was held by non-resident entities.

⁵ GTSOU press releases of 13 March 2020, 4 January 2021, 5 March 2021, and author’s data (for 2004-13).

Short-term progress: the storage business flourishing

In the spring of 2020, European gas prices were low, storage stocks were far higher than usual for the time of year, and oversupply seemed sure to continue during the Covid-19 pandemic. It was expected that Ukrainian storage would provide a 'safety valve' to harbour excess gas volumes,⁶ and it did so during the summer, when gas prices continued to edge lower. Ukraine's net storage injections in the summer of 2020 were far higher than both summer 2019 and the 2015-18 average: 2.3 bcm in July, 3.5 bcm in August and 2.4 bcm in September. Based on tariffs published by Ukrtransgaz,⁷ the cost of injection (booked monthly), storage for 180 days (booked monthly), and withdrawal (booked day-ahead) in Ukraine totals 0.71 EUR/MWh. This is significantly cheaper than in neighbouring Slovakia or Hungary, where, according to market participants, storage auctions tend to produce storage costs slightly higher than the summer-winter spread at the time of the auction conclusion: around 1-6 EUR/MWh. Argus publishes the results of European storage auctions, but in Central Europe only the fixed prices in the Czech Republic regularly show the achieved price, and in 2020 these were also generally in the range of 2-6 EUR/MWh.⁸ With aggregate transport costs from Central Europe to Ukraine and back again of about 1.50-3.00 EUR/MWh⁹, and with summer-winter spreads in summer 2020 exceeding 6 EUR/MWh,¹⁰ the 'customs warehouse' Ukrainian storage offer was popular.

Customs Warehouse: Customs Duty and VAT

Imports of natural gas into Ukraine are subject to a 0 per cent rate of customs duty. Imports of natural gas are also subject to Import VAT at a rate of 20 per cent. Because gas stored in the Customs Warehouse has not technically entered Ukrainian tax jurisdiction, these volumes are not subject to Customs Duty or Import VAT. Furthermore, when an entity holding gas in the Customs Warehouse sells that gas to another entity, and the gas remains in the Customs Warehouse, this transaction is not subject to Sales VAT, again because the gas is technically not in the Ukrainian tax jurisdiction. However, VAT is levied on the services provided by the TSO for the transportation of gas and by storage operator for the injection, storage, and withdrawal of gas. This VAT on services is calculated on the basis of the entry-exit tariffs charged by the TSO and the injection, storage, and withdrawal fees charged by the storage system operator (SSO).

Source: Verkhovna Rada (Parliament) of Ukraine¹¹, PricewaterhouseCoopers¹², and Argus¹³

European traders holding gas in Ukrainian storage include residents (for tax purposes) of Ukraine and non-residents. Non-residents holding volumes in the customs warehouse have had the choice of: selling their gas to Ukrainian-resident companies for customs clearance and domestic sales; repatriating gas to neighbouring markets (mainly Slovakia, Hungary, and Poland); or hedging forward sales for either of the next two winters.¹⁴ Ukrainian resident companies also hold volumes in the customs warehouse, in part to defer taxation on imported volumes. For companies holding resident status, holding stocks in the customs warehouse allows them to retain optionality between re-exporting those volumes or paying

⁶ Pirani and Sharples, 2020. *European gas storage: backhaul helps open the Ukrainian safety valve*. Oxford Energy Comment (May 2020). <https://www.oxfordenergy.org/publications/european-gas-storage-backhaul-helps-open-the-ukrainian-safety-valve/>

⁷ Ukrtransgaz, 2020. *Tariffs & Prices*. <http://utg.ua/en/utg/business-info/tariffs.html>. The price in Euros is based on the April-October average exchange rate of 1 EUR = 31.27 UAH.

⁸ Gas storage auction results published by Argus Media, 2021. *European gas storage auctions*.

⁹ Including the entry-exit tariffs levied by GTSOU (short-haul) and its neighbouring TSOs (eustream, Gaz-System, and FGSZ).

¹⁰ Data from Argus Media. For example, in early June 2020, the average TTF Balance of Month price was just over 4.50 EUR/MWh, while the average Quarter 3 price (that is, for Q1-2021) was around 12 EUR/MWh.

¹¹ According to the Customs Tariff of Ukraine, imports of natural gas (customs code 2711 11 00 00) are subject to 0 per cent rates of customs duty under all regimes: relieved, preferential, and full. See: Verkhovna Rada of Ukraine, 2021. *Customs Tariff of Ukraine (Groups 01-72)*. <https://zakon.rada.gov.ua/laws/show/584%D0%B0-18#Text>

¹² PricewaterhouseCoopers (PwC), 2020. *Worldwide Tax Summaries: Ukraine - Corporate - Other Taxes (31 December 2020)*. <https://taxsummaries.pwc.com/ukraine/corporate/other-taxes>. See the sections on VAT and customs duty.

¹³ Our thanks to Paul Martin of Argus for clarification of this issue

¹⁴ Traders may hold gas in the customs warehouse for up to 1,095 days before becoming liable to pay the 20 per cent import duty. Source: Ukrtransgaz, 2021. *Customs Warehouse Service*. <http://utg.ua/en/utg/gas-transportation-system/customs-warehouse-service.html>

the customs duty and import VAT, which would subsequently allow them to sell into the Ukrainian market. Those subsequent sales are liable for sales VAT, which may be recovered later, as long as the entity has VAT registration in Ukraine. The top ten traders selling to Ukraine (either at the border or from storage), many of whom are likely to be using the customs warehouse facility, are: Axpo Trading, DXT Commodities, Engie, ERU Management Services, Filada, MET Gas and Energy Marketing, Nafta-Gaz Trading, RWE Supply & Trading, Trailstone and Uniper.¹⁵

Trading of gas in storage has grown over the past year. UkrTransGaz and the Ukrainian Energy Exchange (UEEX) announced in February that exchange trading of gas in storage would start in mid-March 2021. The scheme will at first cover customs-cleared volumes traded between resident companies, but will at a second stage, scheduled from late April 2021, be extended to volumes in the 'customs warehouse', including those held by non-residents.¹⁶ This is potentially attractive to traders, because it will increase the number of potential Ukrainian counterparties from which non-resident entities can receive bids for gas they are holding in storage. However, a problem remains: Any entity that sells gas wholesale on the UEEX will be liable for VAT on that transaction, which can be recovered later. Obtaining a VAT refund requires a Ukrainian VAT registration, which in turns requires the establishment of a resident office in Ukraine – something which is not attractive to non-resident traders.^{17 18}

Traders have welcomed the flexibility and efficiency of Ukrainian storage and associated transportation products. It therefore seems likely that these products will continue to play a part in European market development. But limits remain. The effect of cheaper storage costs is in part cancelled out by transportation costs, if the ultimate aim is to re-export or at least preserve scope for this. As the European market gets back into balance and European storage levels are lower, the relative advantage of (cheap and very plentiful) Ukrainian storage will depend on summer-winter spreads and relative competition with neighbouring storage, among other factors. The underlying demand for Ukrainian storage will only become clearer when these spreads narrow.

Finally, as the 'customs warehouse' and 'short haul' services come out of a second successful winter, it is clear that a wide range of European companies have become more comfortable working with Ukrainian counterparties, albeit using those products that limit currency and regulatory risks.

The impact on neighbouring markets

The 'customs warehouse' storage product has developed alongside the 'short haul' discounted transport services offered by GTSOU to both resident and non-resident traders, and the improvement of border interconnection points. The impact of all these changes has been felt in neighbouring markets.

Moldova, which buys its total gas consumption (about 3 bcm/year) on bilateral contracts from Russia, has in recent months taken a series of measures to heighten flexibility and liberalise its market. Moldova began storing gas in Ukraine in October 2020 – so far only a very small amount, under 100 mcm.¹⁹ Since the start of 2021, the bulk of gas transit through Moldova has ceased, as Russian flows through the Trans Balkan pipeline have been rerouted via TurkStream. Consequently, the Moldovan TSO, Moldovatrangaz, has taken steps towards opening up the transportation system for other flows. It has

¹⁵ Argus data

¹⁶ Ukrtransgaz, 2021. The SSO of Ukraine introduces exchanges trading of gas in UGS. *Press Release*, 4 February. <http://utq.ua/en/utq/media/news/2021/the-ssof-ukraine-introduces-the-exchange-trading-of-gas-in-ugsf.html>

¹⁷ "There is no mechanism for a non-resident to register for VAT purposes without a PE [Permanent Establishment] in Ukraine. Accordingly, any Ukrainian VAT incurred by a non-resident is non-recoverable." See: PricewaterhouseCoopers (PwC), 2020. *Worldwide Tax Summaries: Ukraine - Corporate - Other Taxes (31 December 2020)*.

¹⁸ No such VAT charges are liable on customs warehouse trades (i.e., OTC) trades

¹⁹ Moldovagaz, 2020. Началась закачка на хранение газа в украине ('Gas storage started in Ukraine'). *Press Release*, 2 October. <https://www.moldovagaz.md/rus/centrul-de-presa/press-relizy/nachalasi-zakachka-na-hranenie-gaza-v-ukraine>; Sabadus, Aura, 2020. Moldova exports gas to Ukraine. *ICIS*, 1 October. <https://www.icis.com/explore/resources/news/2020/10/01/10559293/moldova-exports-gas-to-ukraine-for-storage-injections>

signed interconnection agreements with GTSOU, and announced its intention to make virtual reverse capacity of 17 mmcm/d available on the main transit route. In August 2020, some test volumes were transported by ERU, a Ukrainian trader, from Greece to Ukraine via Moldova. Currently the transportation tariffs approved by the Moldovan regulator, at USD 11/mcm/100km, are too high to make the route competitive for European traders.²⁰

In Hungary, the TSO, FGSZ, opened the Bereg virtual interconnection point (VIP) with Ukraine in May 2020. Due to the start-up on 1 January 2021 of the Balkan Stream pipeline that brings Russian gas via TurkStream to Serbia – effectively replacing transit via Ukraine and Hungary – FGSZ faces a loss of transit revenue. Two measures currently under discussion that could help to address this in the relatively short term are the establishment of firm bidirectional interconnection capacity on the Croatia-Hungary border, and the development of firm capacity from Hungary to Ukraine (at present there is only interruptible capacity) at Bereg. These changes could open the way to Ukrainian companies buying imported LNG at the Krk terminal in Croatia, which was officially launched in January 2021, although Croatian tariffs may mean this remains uncompetitive.²¹

GTSOU continues to negotiate with Romania, in particular, to improve cross-border interconnection points. One agreement has been signed, covering the Isaccea-Orlivka-1 interconnection point (IP), and GTSOU has publicly urged Transgaz, the Romanian TSO, to sign a further four such agreements.²² In November 2020, Transgaz announced that it will apply EU network codes at border points with non-EU members, paving the way for progress including at the Mediesu Aurit point that would avoid Moldovan transit and is included in the ‘short haul’ regime.²³

Short-term progress: storage and gas market dynamics 2020–21

Throughout 2020, the European gas market was substantially supply-long, as reflected in the exceptionally low summer spot prices. The historically high storage stocks on 1 January 2020 saw only limited withdrawals in Q1 and strong injections in Q2-3, as storage facilities absorbed excess supplies from the market and the low summer prices virtually guaranteed a sizeable seasonal spread. By September and October, European (EU+UK) storage stocks reached 95 per cent of capacity.²⁴

It was in this context that traders placed gas into Ukrainian storage throughout the summer. Between 1 May and 1 November, total Ukrainian storage stocks rose from 16 bcm to 28 bcm (see Figure 1), and the volume held in the customs warehouse rose from 2.4 bcm to 11.2 bcm.²⁵ Of that volume held on 1 November, 10 bcm (89 per cent) was held by non-resident entities, and 5.8 bcm of that volume had been imported under the ‘short haul’ discounted transportation tariff regime.²⁶ Essentially, the sizeable Ukrainian storage facilities, combined with the ease of access to those facilities offered by the short-haul cross-border tariffs and ‘customs warehouse’ (customs duty and import VAT-free regime), offered valuable additional and temptingly profitable storage space when the European market needed it most.

²⁰ Moldovatransgaz, 2020. Moldova will be able to conduct gas transmission through backhaul route. *Press Release*, 30 December. <https://moldovatransgaz.md/en/news/48>; Kozatka News, 2020. Група Эру починає транзит природного газу в Румунію ('Eru Group launches natural gas transit to Romania'), 1 July. <https://kosatka.media/en/category/gaz/news/gruppa-eru-nachinaet-tranzit-prirodnogo-gaza-v-rumyniyu>

²¹ Platts, 2021. Ukraine gas supply: LNG imports from Croatia LNG? *European Gas Daily*, 7 January.

²² Makogon, Sergei, 2020. The Trans Balkan pipeline reimagined. *Natural Gas World*, 21 October. <https://www.naturalgasworld.com/trans-balkan-pipeline-ggp-82781>

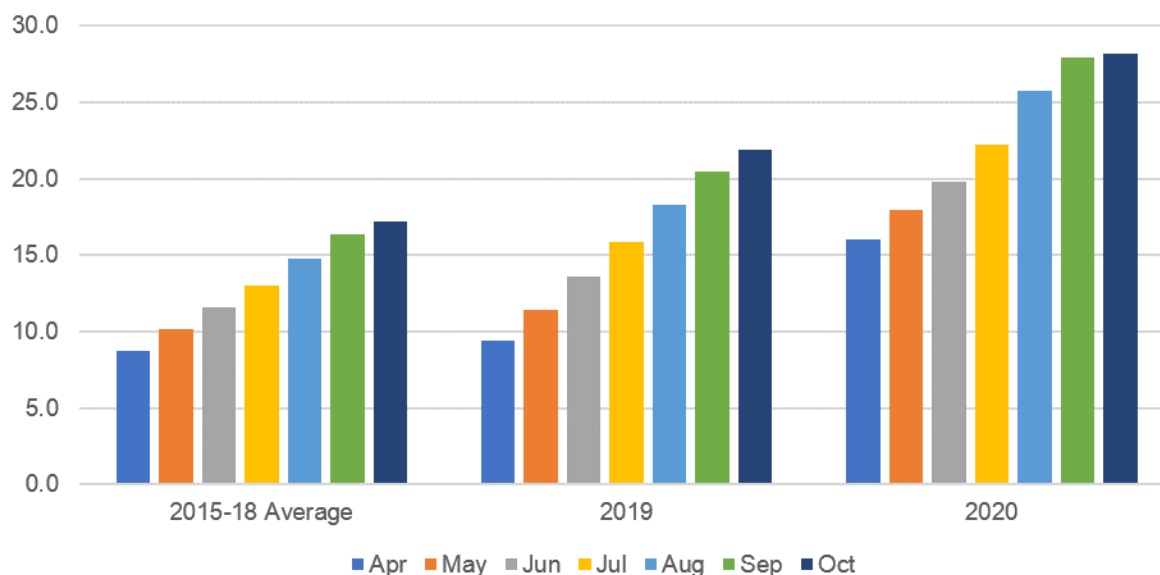
²³ Martin, Paul, 2020. Romania to apply EU gas network codes at non-EU borders. *Argus Media*, 27 November. <https://direct.argusmedia.com/newsandanalysis/article/2164138>

²⁴ Gas Infrastructure Europe, 2021. *Aggregated Gas Storage Inventory (AGSI+)*. <https://agsi.gie.eu/#/>

²⁵ Ukrtransgaz, 2020. In January-April 2020 gas injection into UGS increased by 33%. *Press Release*, 13 May. <http://utg.ua/en/utg/media/news/2020/in-january-april-2020-gas-injection-into-ugs-increased-by-33-percent.html>

²⁶ Ukrtransgaz, 2021. In October, the filling level of Ukrainian UGS reached 28.3 bcm, which will be a stabilizing factor in the heating season. *Press Release*, 17 November. <http://utg.ua/en/utg/media/news/2020/in-october-the-filling-level-of-ukrainian-ugs-reached-28.3-bcm-which-will-be-a-stabilizing-factor-in-the-heating-season.html>

Figure1: Ukrainian Gas Storage Stocks at End of Month in Summer (Bcm)



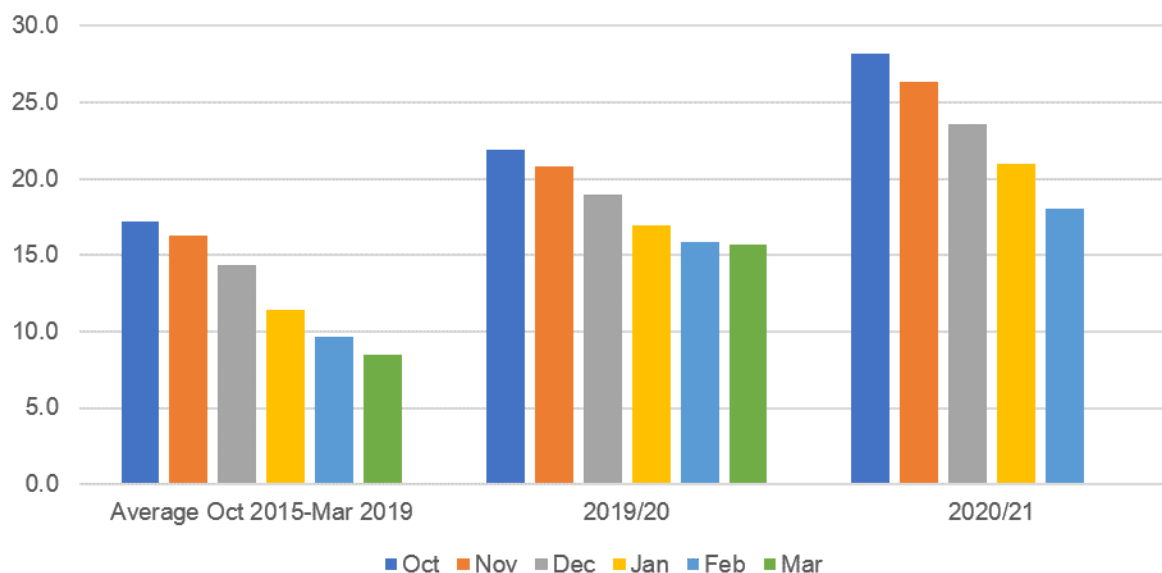
Source: Data from Gas Infrastructure Europe; Graph by the author

Through the winter of 2020/21, between 1 November and 1 March, 10 bcm was withdrawn from Ukrainian storage – a greater volume than was withdrawn in the same period in both winter 2019/20 (6 bcm) and the 2015-19 average (7.3 bcm). Half of that withdrawal occurred in November and December, when total withdrawals were 4.6 bcm (withdrawals from the customs warehouse totalled 2.6 bcm, leaving 2.2 bcm of other withdrawals). In January, 2.6 bcm was withdrawn from Ukrainian storage (customs warehouse stocks declined by 1.1 bcm).²⁷ Then, in February, a further 2.9 bcm was withdrawn from Ukrainian storage (customs warehouse stocks declined by 1.35 bcm).²⁸ As a result, total Ukrainian storage withdrawals in January-February were around 1 bcm higher than in November-December, while the decline in customs warehouse stocks in particular were only slightly higher (2.45 bcm vs 2.2 bcm). Storage stock levels in winter 2020-21, compared to previous years, are shown in Figure 2, and the status of stocks and the share of ‘customs warehouse’ gas stored in Ukraine are shown in Figure 3.

²⁷ Ukrtransgaz, 2021. In January 2021, 2.6 bcm of gas withdrawn from Ukrainian UGS – a third more than last year. *Press Release*, 4 February. <http://utg.ua/en/utg/media/news/2021/in-january-2021-2.6-bcm-of-gas-withdrawn-from-ukrainian-ugs-a-third-more-than-last-year.html>

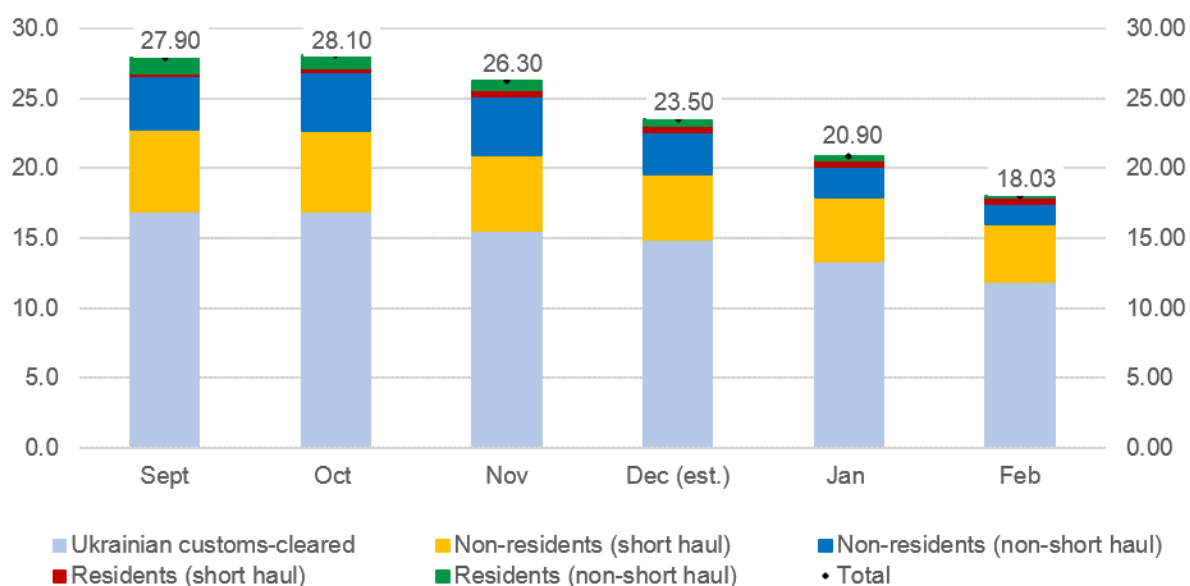
²⁸ Ukrtransgaz, 2021. Frosty February: almost 3 bcm of gas were taken from Ukrainian UGS. This is 2.5 times more than last year. *Press Release*, 3 March. <http://utg.ua/en/utg/media/news/2021/frosty-february-almost-3-bcm-of-gas-were-taken-from-ukrainian-ugs.-this-is-2.5-times-more-than-last-year.html>

Figure 2: Ukrainian Gas Storage Stocks at End of Month in Winter (Bcm)



Source: Data from Gas Infrastructure Europe; Graph by the author

Figure 3: Status of Gas in Ukrainian Storage, End of Month, 2020–21 (Bcm)

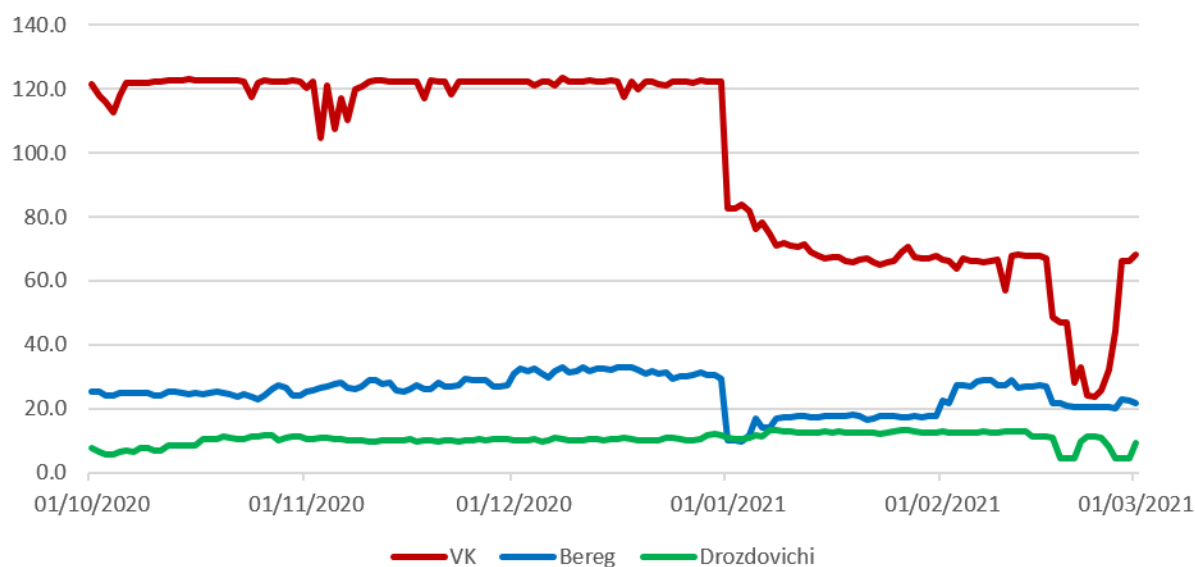


Source: Ukrtransgaz/ author's estimates

The months of January and February 2021 are of particular interest, because they saw an intense spell of cold weather and a surge in weather-related gas demand in Europe and north-eastern Asia. The lack of seasonal storage relative to demand in Asia meant that regional demand there drew LNG cargoes away from Europe, which subsequently relied heavily on pipeline imports and storage withdrawals.

However, the surge in European demand did not result in a wave of volumes being withdrawn from Ukrainian storage and re-exported to Central Europe. In fact, exit flows from Ukraine to Poland (at Drozdovichi) remained stable, exit flows to Hungary (at Bereg) remained stable in January and rose only briefly in early February, while exit flows to Slovakia (at Velké Kapušany) actually fell sharply at the beginning of January, stabilised, and then fell dramatically (albeit briefly) in late February, before recovering by 1 March (see Figure 4).

Figure 4: Exit Flows on Western Ukrainian Border (mmcm/d)



Source: Data from ENTSOG Transparency Platform; Graph by the author

This pattern of storage withdrawals and cross-border flows suggests that, during the European ‘cold snap’ of January-February, gas being held in the customs warehouse by non-resident traders was withdrawn from storage and sold mainly towards the Ukrainian market, with only limited volumes re-exported. These volumes were usually sold to a Ukrainian-resident counterparty before leaving the customs warehouse. Ukrainian-resident entities holding gas in the customs warehouse also seem to have sold their gas to Ukrainian counterparties, rather than re-exporting it. This is confirmed by GTSOU, which stated that the volumes re-exported to Europe from Ukrainian storage were 0.24 bcm in January and 0.2 bcm in February.^{29,30} This total of 0.46 bcm being re-exported to the EU in January-February is just 19 per cent of the 2.45 bcm that was withdrawn from the customs warehouse (and 8 per cent of total Ukrainian storage withdrawals) in that period.

The marketing campaign of GTSOU has emphasised that Ukrainian storage is cheaper than in its western neighbours, while the ‘short-haul’ entry-exit tariff on the Ukrainian side (combined with the ‘customs warehouse’ regime) is an inducement to European traders to place their gas in Ukrainian storage in the summer, for consumption in Central Europe in the winter. However, the tariff multipliers levied by TSOs in Central Europe can be quite high: Day-ahead capacity tariffs can be around 20-25 per cent higher than monthly tariffs, and three times higher than annual bookings. This can limit the commercial attractiveness of responding promptly to a sudden surge in Central European spot prices, from the perspective of those holding gas in Ukrainian storage.

Our analysis of the published entry-exit tariffs of both GTSOU and its Central European counterparts, and the storage tariffs published by Ukrtransgaz and its Central European counterparts, suggests that the discount on Ukrainian storage costs is very much in the same range as the cost of transporting gas across borders. However, the precise comparisons depend upon the volume being stored, the length of time the gas is stored, the rate of injections/withdrawals, and the type of cross-border capacity being booked. Specifically, the cost of moving gas across borders on a day-ahead basis can be prohibitively

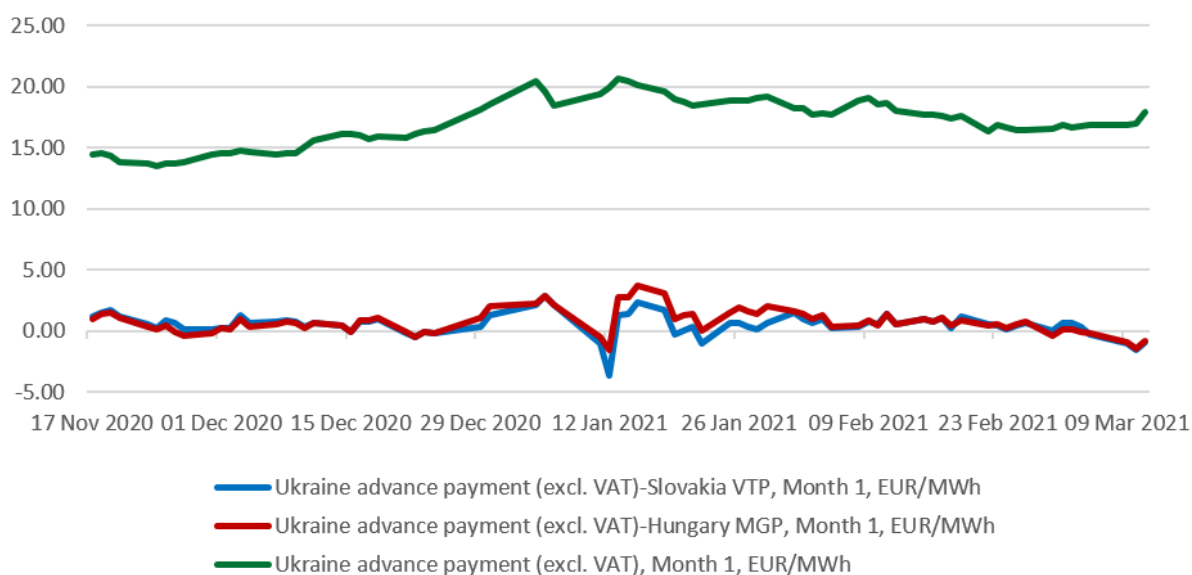
²⁹ GTSOU, 2021. Growth in gas demand by 4 times: GTSOU provided transportation of natural gas to Ukraine in January. *Press Release*, 3 February. <https://tsoua.com/en/news/growth-in-gas-demand-by-4-times-gtsou-provided-transportation-of-natural-gas-to-ukraine-in-january/>

³⁰ GTSOU, 2021. GTSOU: the volume of gas re-export increased 6 times in February – up to 199 million cubic meters. *Press Release*, 5 March. <https://tsoua.com/en/news/gtsou-the-volume-of-gas-re-export-increased-6-times-in-february-up-to-199-million-cubic-meters/>

expensive, unless the spread between prices in Ukraine and Central Europe is exceptionally wide. This suggests that Ukrainian storage is more attractive for seasonal balancing than for short-term winter-hedging and more 'nimble' trading activities in reaction to short-term pricing shifts.

In addition to comparing the costs of storing gas in Ukraine or Central Europe when the intention is to sell that gas back into Central Europe, there is also a comparison to be made between re-exporting gas into Central Europe and simply selling it to a Ukrainian counterparty. As discussed earlier, for non-resident companies, such counterparties are likely to be Ukrainian traders, while resident companies may also be able to sell directly to final consumers. The key factor here is the differential between prices in Central Europe and prices on the Ukrainian market. That spread is illustrated in Figure 5.

Figure 5: Front-Month Gas Price in Ukraine and Spread Between Front-Month Prices in Ukraine and Slovakia/Hungary (EUR/MWh)



Source: Argus Media

The premium of prices in Ukraine over those in Slovakia/Hungary through most of winter 2020/21 reflects the fact that Slovakia and Hungary have greater diversification of supplies, and the positive steps taken to reform the domestic Ukrainian gas market. For those holding gas in the Ukrainian customs warehouse, the decision about where to sell that gas is informed by the comparison between the price they might achieve in Central Europe (minus the relevant entry-exit transportation tariffs) and the price they might be offered by a Ukrainian counterparty. The latter will reflect (1) Ukrainian market prices and their counterparty's need to pay both the 20 per cent import VAT (and, technically, 0 per cent customs duty) to bring the gas out of the customs warehouse and into the domestic market, and (2) the difference between the short-haul and regular entry exit tariff charged by GTSOU, given that the short-haul tariff is only available for volumes that are both imported and re-exported.

The combination of storage withdrawals, cross-border flows, and relevant prices in Ukraine and its western neighbours leads to the conclusion – confirmed in interviews with market participants – that it was simply commercially advantageous for traders holding gas in the customs warehouse to sell to Ukrainian counterparties rather than seek to re-export their volumes. A practical example of this occurred in mid-January 2021, when the Ukrainian price premium over Slovakia turned sharply (albeit only briefly) to a discount, as illustrated in Figure 5, but daily flows from Ukraine to Slovakia did not change (as illustrated in Figure 4). It seems that traders were prevented from taking advantage of the price spike by the cost of moving the gas across the border. In more general terms, January 2021 saw aggregate European (EU+UK) storage withdrawals reach record levels for that month, while buyers holding TTF-linked supply contracts were incentivised to nominate quick take from Gazprom. As a result, there was little call for additional supply to the European market from Ukrainian storage.

This leads to the conclusion that while Ukrainian storage played a valuable role in absorbing excess volumes in the summer of 2020, it has also furthered Ukraine's integration into the European gas market by giving traders optionality, between re-exporting their volumes, selling to a Ukrainian counterparty, or holding the stocks until the following year. However, it is a limited optionality: In terms of re-exports, the relatively high day-ahead entry tariffs to move volumes back into Central Europe are a barrier, despite the competitive Ukrainian tariffs for storage and transportation. In terms of selling into the Ukrainian market, many traders remain reluctant to create resident entities that could overcome the limitations around exchange trading and access to VAT refunds.

Long-term challenges: market reform in Ukraine and Moldova

For Ukraine's government, and companies in the energy sector, the development of the storage business and 'reverse flow' transportation is part of the larger project of closer integration with the European Union. In addition to changes in the gas sector, this has been reflected in the adoption of decarbonisation policies loosely coordinated with those of the EU; electricity market reform and the expansion of renewables; and the planned reduction of coal production and use.³¹ But overall, market reform is moving more slowly than expected.

In the gas sector, the unbundling from Naftogaz of GTSOU, and the reorganisation of gas storage business within Ukrtransgaz, concurrent with the signing of a new five-year transit contract with Gazprom at the end of 2019, were seen as steps forward. Purchases of gas in Ukraine for industry have long been unregulated; going into winter 2020-21, it appeared that reform was progressing, with price liberalisation introduced in the residential sector from August 2020, and due in the district heating sector from May 2021. But in January, as European hub prices rose, the government imposed a temporary price cap on gas sold to residential customers in February and March. The cap was set at 6.99 UAH/cubic metre including VAT, which equates to 19.43 EUR/MWh including VAT.³² This move came during a wave of social protests against a range of rising prices and tariffs, which have aggravated the drastic effects of the coronavirus pandemic on millions of low-income households.³³ The price cap is now expected to be extended, and the liberalisation of prices for heating companies postponed.

In the residential market, the dominance of Regional Gas Company (RGC), which supplies most customers (about 8 million households) and controls most distribution companies, is under competitive challenge from Naftogaz, which intends to raise its customer base from about 800,000 currently to more than 2.5 million by 2025.³⁴ The Anti-Monopoly Committee of Ukraine has now levied two substantial fines on RGC for abuse of dominance, and in January announced that it was launching a further series of investigations against the group at regional level.³⁵ However, the price cap is likely to deter new entrants to the residential gas market. In the heat sector, price caps on heat as well as gas remain, and little progress has been made in reforming underfunded publicly-owned providers.

The evolution of the traded market, in which the purchasers are energy sector and industrial companies, continues. Turnover on the Ukraine Energy Exchange (UEEX) totalled 2.5 bcm of gas in 2020, including 1.16 bcm sold by Naftogaz Trading – a substantial share of this 14-15 bcm market segment.³⁶ Most

³¹ Pirani, Simon, 2020. The market takes shape: the Ukrainian gas sector to 2030. *Oxford Energy Insight № 77 (October)*. <https://www.oxfordenergy.org/publications/the-market-takes-shape-the-ukrainian-gas-sector-to-2030/>

³² Based on an exchange rate of 1 EUR = 34 UAH and a cubic metre to MWh conversion factor of 94.5 (10.58 kWh per m³).

³³ Interfax, 2021. Ukrainian Prime Minister Denys Shmyhal: Those in power must always face pressure from opposition – that's democracy. *Interfax*, 20 January. <https://interfax.com/newsroom/exclusive-interviews/70862/>; Guz, Serhii, 2021. In Ukraine, anger over fuel poverty. *Open Democracy*, 15 March. <https://www.opendemocracy.net/en/odr/tariff-protests-ukraine/>

³⁴ Naftogaz Ukrainy, 2021. *Strategy 2025 presentation (18 February)*.

https://www.naftogaz.com/files/Zvity/NG_STRATEGY_2025_18.02_en.pdf; Pirani, 2020. *The market takes shape*, pp. 10-11

³⁵ Interfax Ukraine, 2021. АМКУ усматривает признаки доминирования группы "РГК" на рынке природного газа ('AMCU sees signs of domination of the RGC group in the natural gas market'). *Interfax Ukraine*, 13 January. <https://interfax.com.ua/news/economic/715788.html>

³⁶ UEEX, 2021. UEEX 2020 Natural Gas Trading Results: Growth and Opening of New Markets. *Press Release*, 14 January 2021. <https://www.ueex.com.ua/eng/presscenter/news/ueex-2020-natural-gas-trading-results-growth-and-opening-of-new/>

volumes are sold on a monthly (inter-month, month ahead or two months ahead) basis; prepayment is dominant; standard contracts are only now being introduced. UEEX has introduced within-day and day-ahead trading, but volumes are insubstantial; futures products are in development. Traders have difficulty accessing credit, and in November 2020, Naftogaz launched a product with 10 days post-payment, on condition of a 100 per cent bank guarantee. In February 2021, this was extended to a 45-day deferred payment scheme.³⁷

Efforts are also being made to bring market regulation into line with the EU. Two MoUs, at political and technical levels, have been signed between UEEX, GTSOU, the regulator, the Energy Ministry and the Energy Community Secretariat to this end. One unresolved issue is bringing the balancing regime into line with the EU Balancing Network Code, which in turn requires the setting of conversion neutrality fees.³⁸ That, in turn, has been obstructed by the high level of outstanding balancing debts to GTSOU by regional distribution companies, and the concern by other traders that these would unfairly influence the level of neutrality fees.³⁹

Over the longer term, changes to upstream regulation, designed to stimulate investment, may result in increases in domestic gas production, from the current level of 19-20 bcm/year, that have eluded successive Ukrainian governments. In November 2020, the government transferred to Naftogaz the right to conduct exploration on the Black Sea shelf, and in December, Naftogaz took a controlling stake in the holder of the Yuzivska PSA, formerly operated by Shell. Exploration, with a view to raising its 158 bcm of undiscovered reserves to 500 bcm or more, is central to Naftogaz's new business strategy announced in February 2021; the company intends to prioritise gas trading and upstream operations, in partnership with international investors.⁴⁰

Moldova has also begun to follow Ukraine away from a gas sector model dependent on Russian imports and controlled prices. In October 2020, the pipeline link from Ungheni on the Romanian border to Chisinau, the Moldovan capital, was completed. Although it is still not being used, it gives Moldova access to gas supplied across its western border by European companies, thus strengthening its hand in price negotiations with Gazprom. This produced results at the start of 2021, when Moldovagaz, which has previously bought gas on oil-linked long-term contracts, agreed with Gazprom to use the same formula for purchases in the first and fourth quarter of the year, but to move to prices linked to the NCG hub in the second and third quarter. Moldovagaz said that in 2020 it paid an average of 148.87 USD/thousand cubic metres for Russian imports (4.12 USD/MMBtu or 12.33 EUR/MWh).⁴¹

Moldova, a member of the Energy Community, is also proceeding with other aspects of market reform. It is scheduled this year to liberalise some price bands, and to unbundle Moldovatransgaz, the gas transmission company, from Moldovagaz. The progress made on interconnection points (see above) may, in the context of ongoing reform, lead to closer integration of Moldova, as well as Ukraine, with European markets, and to closer integration of Moldova's gas transportation system with a repurposed Trans Balkan corridor.

³⁷ UEEX, 2021. Naftogaz came to the exchange with new favourable terms. *Press Release*, 18 February.

<https://www.ueex.com.ua/eng/presscenter/news/naftogaz-came-to-the-exchange-with-new-favorable-terms-of-gas-pa/>

³⁸ As reported by Argus, "A conversion neutrality fee was published by Nerc [the Ukrainian regulator] on 13 February [2021], intended to compensate GTSOU for expenses related to system balancing services it performs on behalf of market participants... Some market participants have challenged the methodology for calculating the operator's expenses and called for clarification". See: Argus Media, "Calls for clarify on Ukraine's gas neutrality fees", 23 July 2020

<https://www.argusmedia.com/news/2125785-calls-for-clarity-on-ukraines-gas-neutrality-fees>

³⁹ Energy Community, Annual Implementation Report (1 November 2020), p. 187; See also Pirani, 2020. *The market takes shape*, pp. 9-10

⁴⁰ Interfax Ukraine, 2020. Naftogaz becomes owner of Nadra Yuzivska. *Interfax Ukraine*, 18 December.

<https://en.interfax.com.ua/news/economic/710901.html>; Naftogaz Ukrainy, *Strategy 2025 presentation* (p.18).

⁴¹ Elliott, Stuart, 2020. New Moldovan gas link complete, but doubts remain over use. *S&P Global Platts*, 9 October.

<https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/100920-feature-new-moldovan-gas-link-complete-but-doubts-remain-over-use>; Moldovagaz, 2021. Кон'юнктура спотового ринка включена в контракт на закупку газа (Spot market conditions included in the gas purchase contract). *Press Release*, 29 January. <https://www.moldovagaz.md/rus/centrul-de-presa/press-relizy/konjunktura-spotovogo-rynka-vklyuchena-v-kontrakt-na-zakupku-gaza>

In some respects, gas market reform has moved further in Ukraine than in EU member states such as Poland and Romania. In the medium term, the number of companies trading inside Ukraine, rather than just at the border, could grow. Ideally, upstream investment would follow. The maturing of the traded market will in turn deepen the whole CEE market, given Ukraine's relative size. Moldova will follow, albeit at some distance.

Long-term challenges: integration of eastern European markets

Over a five- or ten-year timescale, the path of Ukrainian-European gas market integration will be determined by changing patterns in the transit of Russian gas, as much as by the factors mentioned above. With the commissioning of the TurkStream pipeline, Gazprom has continued its strategy of filling up the pipelines in which it has ownership interests and reducing flows through Ukraine accordingly. We expect that the completion of Nord Stream 2, although likely to be further delayed, will continue this trend, as will extension of the Balkan Stream line to Hungary, scheduled for October 2021. The political and diplomatic news flow indicates that Germany may press for some assurances about the level of gas transit through Ukraine over a limited period, but it is unlikely that this will change the overall direction of change.⁴² After the current Gazprom-Naftogaz contract expires at the end of 2024, it remains likely that the Ukrainian route will be required only for residual Gazprom flows of 10-20 bcm/year, and as back-up in case of seasonal fluctuation.

GTSOU's development strategy in the face of lower levels of Russian transit, as outlined by executives of the company in recent publications, includes: (1) a focus on resuming Central Asian gas deliveries to Europe; (2) development of the Trans Balkan gas corridor, in particular to facilitate south-north gas flow; and (3) closer cooperation with Slovakia on market integration, with Poland with regard to the use of Ukrainian storage by Polish companies and for LNG deliveries via Swinoujscie, and with Hungary with regard to accessing LNG from Krk.⁴³

The renewal of Central Asian gas deliveries to Europe – which effectively ceased a decade ago, as Gazprom centralised the Russian purchase and trading of Central Asian gas – is unlikely in the near future. Like the delivery of Russian gas for sale on the eastern Ukrainian border, it would require a considerable improvement in Russia's political relationships with Ukraine and Europe, of which there is currently little indication.

The key to the development of the Trans Balkan corridor as a source of Ukrainian gas imports is gaining access to diversified supplies, either in the form of Romanian production or volumes sourced from Bulgaria, at the foot of the corridor. The latter could be the re-export of volumes that arrive in Bulgaria via either Turkish Stream or the delayed Greece-Bulgaria Interconnector, which is now scheduled for launch by the end of 2021. The volumes originating in Greece could be Azeri gas from the Trans-Adriatic Pipeline (contracts are in place for both Greece and Bulgaria to each receive 1 bcma from TAP) or LNG imported into Greece. Regarding the latter, the Alexandroupolis Floating Storage and Regasification Unit (FSRU) is currently under development, with the Bulgarian TSO, Bulgartransgaz, confirming its purchase of a 20 per cent stake in the project in January 2021. The project is planned for launch by the end of 2023.⁴⁴ The source could also be Russian gas supplied via TurkStream, being resold by traders just as the gas purchased by Ukrainian entities from European traders on Ukraine's

⁴² The effect of Nord Stream 2 construction on transit has been covered by previous OIES publications, including Pirani and Sharples, *The Russian gas transit deal: opening a new chapter* (February 2020), Pirani et al, *Implications of the Russia-Ukraine gas transit deal for alternative pipeline routes and the Ukrainian and European markets* (March 2020), p. 15; and Pirani, 2020. *The market takes shape*, p. 17

⁴³ Bielkova, Olga, 2021. How to improve EU-Ukraine energy cooperation in 2021, *Atlantic Council*, 7 Jan 2021. <https://www.atlanticcouncil.org/blogs/ukrainealert/how-to-improve-eu-ukraine-energy-cooperation-in-2021/>; Sergei Makogon, Sergei, 2020. The Trans Balkan pipeline reimaged. *Natural Gas World*, 21 October. <https://www.naturalgasworld.com/trans-balkan-pipeline-ggp-82781>

⁴⁴ Gastrade, 2021. Completion of the participation of Bulgartransgaz to the LNG Terminal in Alexandroupolis, *Press Release*. 28 January. <http://www.gastrade.gr/en/the-company/news-press-releases/completion-of-the-participation-of-bulgartransgaz-to-the-lng-terminal-in-alexandroupolis.aspx>

western border could easily be Russian in origin. For Naftogaz and other Ukrainian gas importers, the physical source of the gas matters less than name of the commercial counterparty.

The common element of several of these potential supply sources is that they are not yet operational, whether that is Romanian Black Sea offshore production, the Interconnector Greece-Bulgaria (IGB), or the Alexandroupolis LNG import terminal. Therefore, in the short term, the volumes available via the Trans-Balkan corridor are likely to be of Russian origin, re-exported by non-Russian traders from Bulgaria to Ukraine in a south-to-north direction, just as non-Russian traders in Central Europe re-export Russian gas to Ukraine. The key to increasing connectivity along the Trans-Balkan corridor is solving the regulatory and commercial issues around the Romania-Ukraine, Romania-Moldova and Moldova-Ukraine interconnection points.

Closer Ukrainian cooperation with Poland, Slovakia and Hungary currently appears to be the aspect of GTSOU's development strategy most likely to yield tangible results in the near-term future, although some challenges remain to be overcome. In Slovakia's case, this is a matter of changing regulation of existing infrastructure, with specific reference to increasing the volumes that the Slovak TSO, eustream, is prepared to offer GTSOU as backhaul at Velké Kapušany.

In the cases of Poland and Hungary, some investment is needed to strengthen interconnection points. For example, on 11 January 2021, traders' demand for capacity to re-export gas from Ukraine to Poland exceeded the technical capacity of the cross-border interconnection (14.2 mmcm/d of nominations versus 12.9 mmcm/d of capacity). As a result, GTSOU proportionally limited re-exports under the 'short haul' tariff (the most interruptible) from 3 mmcm/d to 1.7 mmcm/d.⁴⁵ This was an exceptional occurrence, but highlighted the need for cross-border physical interconnection capacity sufficient to allow Ukrainian storage stocks to be moved rapidly across Ukraine's western border. In terms of using cross-border interconnections to connect Ukraine to the Swinoujscie and Krk LNG terminals, although the volumes of LNG that might reach Ukraine are probably minimal (for commercial and economic reasons), the growing liquidity of these markets is to common advantage.

Conclusions

The successful marketing of Ukrainian storage capacity, and associated transport services, to the European gas market made economic and commercial sense in the exceptional conditions of 2020: there was an oversupplied market, Europe's own storage was nearly full, gas prices were unusually low and summer-winter spreads were wide. Over the next two or three years as the market rebalances, spreads are likely to tighten and the unusual conditions that made this venture so successful will not be repeated. The 'customs warehouse' may not be used on such a large scale each year. Nevertheless, Ukrainian integration with the European gas market has been pushed forward. Ukrainian companies have seen the potential of regulatory alignment with the EU; European companies have become comfortable working with Ukrainian counterparties.

By the middle of the decade, east-west flows through the Ukrainian transportation system will be substantially reduced. Notwithstanding the fact that, at a political level, Germany may demand some assurances on continued use of the system after the commissioning of Nord Stream 2, and notwithstanding the fact that commissioning may be further delayed, the end result is likely to be that the Ukrainian transit system will be used only for seasonal flexibility and as back-up to non-Ukrainian routes that Gazprom will prioritise. Thus, the Ukrainian gas transportation system will be utilised at a much lower level than in the past, even assuming that (1) cross-border connectivity in Central and South-Eastern Europe continues to improve; (2) the use of Ukrainian storage continues, albeit not at the level of 2020-21, mainly via reverse flow from Hungary and Slovakia; and (3) it is enhanced by greater use of Ukrainian storage by Polish companies. Revenue from the transit of Russian gas will fall.

⁴⁵ GTSOU, 2021. Orders for gas transportation at the Polish border have exceeded the guaranteed capacity of Ukrainian GTS exit point. *Press Release*, 11 January. <https://tsoua.com/en/news/orders-for-gas-transportation-at-the-polish-border-have-exceeded-the-guaranteed-capacity-of-ukrainian-gts-exit-point/>

Ukrainian companies have, however, already shown their ability to take advantage of business opportunities afforded by closer integration with Europe. For GTSOU, this will no doubt be the main focus of activity.

From the European point of view, these changes open up the large Ukrainian gas market for investment and trade over the long term. Gazprom, which less than a decade ago dominated the market, is no longer commercially active in it, and its return is unlikely without a sea change in political relationships. From the Ukrainian point of view, closer integration with the European market, and a shift of focus away from the east-west gas transit business, will free up political, management and investment resources to focus on the modernisation and decarbonisation of the energy sector.