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ONE YEAR TO ZERO HOUR: in search of a compromise on Ukrainian gas transit

December 2018

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SUMMARY

The current contract between PJSC Gazprom and NJSC Naftogaz of Ukraine is due to end in exactly one year. Gazprom will not have had enough time to complete the construction of all diversification gas pipelines by that point: by 2020, only one string of the Turkish Stream is guaranteed to be launched (operating for the Turkish market). Nord Stream 2 will probably be commissioned some time later, while the construction of the second line of the Turkish Stream can be expected in two-three years' time.

All this makes it necessary to sign a new transit agreement with Ukraine. At the same time, considering the plans to gradually bring online new gas transmission capacities, Gazprom is interested in new short- or medium-term arrangements. In turn, Naftogaz of Ukraine is vested in a new long-term contract to ensure that its gas transmission system is sufficiently loaded.

The objective of the new transit agreement is complex: it is not limited to a mathematical comparison of necessary export volumes and available gas pipeline capacities. Russia also needs to consider whether it will be able to «reach» all the countries buying Russian gas with its new gas pipeline systems. There is also the factor of irregularity of supplies, which means that the capacity of gas pipelines has to exceed transit volumes. The possibility of using underground gas storage facilities - both in Europe and in Ukraine - will also affect the ultimate setup of market operations. It is necessary to understand whether reverse gas supplies to Ukraine will continue, or whether Gazprom and Naftogaz of Ukraine will again switch to deliveries under a direct contract. It is important to note that reverse supplies increase both European exports of Gazprom and gas transit volumes through Ukraine.

One of the remaining factors of uncertainty is whether European companies will take part in the management of the Ukrainian GTS. There is also the possibility of delivering some of the gas intended for European consumers to Ukraine's eastern borders.

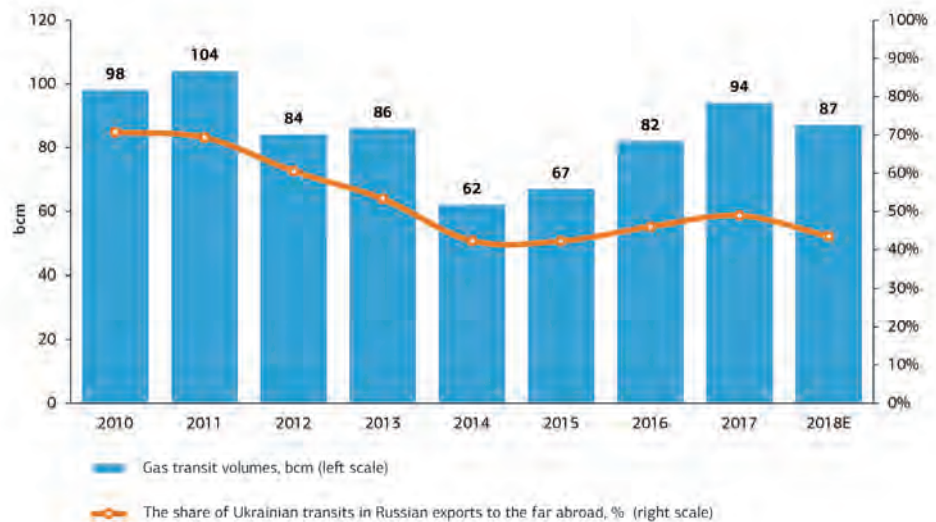
Gas transit tariff will certainly be a key factor in the negotiations. There is no doubt that in the new agreement the tariff will directly or indirectly depend on the obligations in relation to gas volumes pumped, which Gazprom will take on.

The interrelationship of all these factors analyzed in this paper will determine the final agreements, configuration and, most importantly, the cost of Russian gas transits through Ukraine after 2019. The three parties in the negotiation process indeed face a complex task: to agree all these complex parameters of the new agreement within the coming year. In the worst case scenario, there could be a repetition of the 2008/2009 winter events. The agreements would be signed at the last moment (although probably without a dramatic interruption of gas supplies to Europe). We very much hope that this development can be avoided.

INTRODUCTION

During the Soviet period, nearly all gas exports to Europe were piped via the Ukrainian corridor. 27 years have passed since the collapse of the USSR, but the Ukrainian route for exporting Russian gas to the European market still plays an important role: even now, after the construction of new diversification gas pipelines (Yamal-Europe, Nord Stream, Blue Stream), transit through Ukraine accounts for around 40% of overall supplies. This percentage remains even given a significant increase in export volumes in the last three years: over 80 bcm of gas were piped annually via the territory of Ukraine (see Figure 1).

Figure 1 Russian gas transits via Ukraine and their share in total exports



Sources: Naftogaz-europe.com, «Gazprom Export», SKOLKOVO Energy Centre

Up until 2009 Russian gas deliveries to Ukraine and gas transits to Europe were not transparent: various intermediaries were involved, and gas from Central Asia was also piped to Ukraine, where it was «mixed» with Russian gas to achieve a price acceptable for both sides.

The contract signed in January 2009 until December 2019 followed the «gas war» and opened a new stage in the gas relations of the two countries. Intermediaries were dropped, and contracts for transit and deliveries were made separate. At the same time, there was a close link between the separate contracts, in particular, in relation to determining transit tariffs. The contracts were signed based on what appeared at the time to be market conditions. Moreover, information leaks to the media on the new contracts (a rare precedent for gas contracts in the world in general) created further transparency [1]. Stockholm Arbitration Institute was chosen as the judicial authority.

Gas prices under this contract looked high but were in fact acceptable. They were determined according to a standard European format with a link to the oil basket price. However, the agreement was signed in January 2009, when the oil price was 45 US Dollars/barrel. Later crude oil prices began to rise, «pulling up» prices of gas for Ukraine. At the same time projected economic growth for Ukraine turned out to be over

optimistic – as a result the country did not need the volumes specified under the «take or pay» clause. The minimum amount to be paid annually by Naftogaz of Ukraine was calculated based on the Annual Contract Quantity (ACQ). Starting in 2010, ACQ totalled 52 bcm of gas per year, while the Minimum Contract Quantity (MCQ) reached 41.6 bcm (80% of ACQ).

The Ukrainian side increasingly called the contract unfair, demanded a review of obligatory supplies and unilaterally lowered own take-off of gas. At the same time political factors compounded this dispute, as in 2010 the discount on gas for Ukraine (30% of the price, but not over 100 US Dollars/thousand cm) was offered in exchange for prolonging the lease for the Black Sea Fleet naval base in the Crimea. However, the conflict following the events of 2014 began after this, and the discount was abolished in its wake. Friction intensified. As a result, as of November 2015 Naftogaz of Ukraine refused direct imports of Russian gas entirely, switching to reverse gas supplies (see Section 6 for details).

On the 16th of June 2014 Gazprom introduced a prepayment regime for Ukraine and simultaneously submitted an application to the Stockholm Arbitration Institute demanding payment for gas supplied. Later Gazprom specified the amount of its demands, including a demand for the payment of the Ukrainian company's liabilities under the «take or pay» clause for 2012-2016. In response Naftogaz of Ukraine filed a claim for a retrospective revision of the contract price of gas supplies and demanded compensation of all overpayments starting May 2011. In July 2014 these court cases were consolidated. In addition, on the 13th of October Of 2014 Naftogaz of Ukraine initiated arbitrary proceedings in relation to the gas transit contract. The company demanded changes to the contract in accordance with the Ukrainian legislation, a retrospective increase in the transportation tariff starting with 2010 and a compensation of the difference between the cost of transit through Ukraine of 110 bcm of gas annually and the volumes which were actually transported [2].

In December 2017, the arbitrators made a final decision regarding the supply contract, and in February 2018 - in respect of the transit contract. The decisions of the arbitration were controversial (the Ukrainian side was «forgiven» for not taking gas under the «take-or-pay» clause and the Russian side was given fines for non-fulfillment of the «pump-or-pay» provision, although the latter is specified in the contract very implicitly). However, strictly speaking, any court decision would have caused reproaches from one of the parties: too many factors, and primarily political ones, formed part of this dispute. The contract itself had been signed in a hurry, in the conditions of a force majeure, and some of its provisions could be interpreted in two ways.

Anyway, right now, in 2019, it will be possible to try and turn the conflict page in the gas relations of the two countries and start from scratch. This is even more the case given that in the years that have passed

since the signing of the Russian-Ukrainian gas contract, the model of the European gas market with trading hubs, virtual reverse capabilities and other innovations has finally taken shape. Naftogaz of Ukraine is also actively implementing new standards, including those on the transparency of the market. All of this creates additional opportunities for transparent relations under the new contract.

In reality, an unprecedented tangle of mutual disputes, a difficult economic and political situation in Ukraine (which creates risks for European investors who, as a third and interested party, could become transit guarantors) significantly complicate future negotiations. Nevertheless, it is necessary to resolve the problem, as Russia, Ukraine and the EU will not be able to do without the Ukrainian transit in the coming years.

SECTION 1. GAS TRANSIT THROUGH UKRAINE. ESTIMATES AND UNCERTAINTIES

In the decade which has passed since the signing of the existing transit agreement between Russia and Ukraine, there have been many changes both in the negotiating positions of the parties and in the overall market situation. It is extremely likely that the construction of the Turkish Stream gas pipeline (1st line) and Nord Stream 2 will be completed and that the pipelines will be brought online. This means that after the end of 2019, when the current transit agreement with Ukraine expires, and the new diversification gas pipelines are ready or nearly ready, transit volumes through Ukraine will start declining. At the same time, as shown below, it will not be possible to completely abandon the Ukrainian route when exporting gas. Perhaps the most sensitive question is: how much transit and under what conditions would be acceptable to all participants in this most complex negotiating process - Russia, Ukraine and the EU?

We are deliberately not discussing the «ultra-precise» scenarios for future transit flows through Ukraine (or more precisely, the necessary capacity of transit gas pipelines), since the existing uncertainties, discussed below, can significantly affect the final figures:

- The factor of European demand for Russian gas, difficult to predict (Section 2);
- The factor of the second string of the «Turkish Stream»: when the European section of the pipeline will be constructed and commissioned and which markets this gas will be delivered to (Section 3);
- The factor of supply irregularity, which requires the capacity of transit pipelines to be above average annual gas supply volumes. This factor can be mitigated by using underground storage facilities, primarily Ukrainian ones. However, it remains to be seen to what extent they will be utilised. (Sections 4, 5);
- The functioning of gas diversification pipelines above (the case of Nord Stream in 2018) or below project capacity (Nord Stream in 2017);
- In addition, there are two directions of Ukrainian transit - the western and the southern. They do not overlap, therefore, it is necessary to consider each direction separately when analyzing replacement of Ukrainian transit with new gas pipelines. It may not be easy to «reach» the end consumers with new pipes on some routes in 2020-2021. This is one of the reasons for Russia to retain its interest in the Ukrainian gas transmission corridor (Section 3);
- Will reverse gas flows to Ukraine remain in place or will Gazprom and Naftogaz of Ukraine revert to a direct contract? In our scenario we retain the current supply arrangement, but we should remember that such an arrangement increases Gazprom's exports to Europe and gas transit volumes through Ukraine by roughly the volume of gas imported by Ukraine using «reverse flows»

(Section 6).

- We leave potential differences in the balance of demand and the required transported volumes outside the scope of our discussion. This is because the entire discussion is conducted using volumetric gas flow units. In most of the estimates, we rely on the Russian data on export volumes and gas pipeline capacity (measurements at 20 °C and pressure of 1 atm). However, in parentheses we note that different organisations use different standards (this is important, for example, when comparing gas consumption forecasts with gas pipeline capacity, made by various research centres). All other conditions being the same, the differences in measuring gas volume at 0 and 25 °C will be 9% (!) and over 7% at 0 and 20 °C !

In recent years, Gazprom's tactics in gas transportation remain the same: firstly, all the pipelines bypassing Ukraine are loaded to maximum capacity, and the «flexible» Ukrainian corridor is responsible for all demand fluctuations (while performing the basic transit function for some volumes, for details see Section 4).

In 2017, Gazprom exported 93 bcm of gas via Ukraine. In 2018 transit volumes can be estimated at 87 bcm (for 11 months of 2018, transit totalled 79.2 bcm). Despite the fact that Gazprom's exports rose in 2018 there is no contradiction here. Let us recall that in 2017, the Nord Stream pipeline was underutilized from February to September 2017 as Gazprom had no access to part of the Opal gas pipeline capacities. Transit for the year totalled 51 bcm. Now Nord Stream is utilized at capacity above design (up to 59 billion cubic meters) [3]. Let us also recall that, in addition to deliveries to Europe and Turkey, Ukrainian transit includes supplies to Moldova, which account for up to 3 bcm annually (2.7 billion in 2017).

Given the most likely development of events, we assume that in the next two years (up until the end of 2020), Nord Stream-2 with a capacity of 55 billion cubic meters and the first string of the Turkish Stream with annual capacity of 15.75 bcm will be built and brought online (Turkish stream will become operational at the start of 2020). These two routes will provide a total of 70.75 bcm of gas transmission capacity. Therefore assuming that gas exports remain at current levels and the loading of new pipes will be within their design capacity, and other pipelines will be loaded as in 2018, the Ukrainian corridor will handle 16 (87-71) bcm of transit, of which up to 3 bcm will be to Moldova.

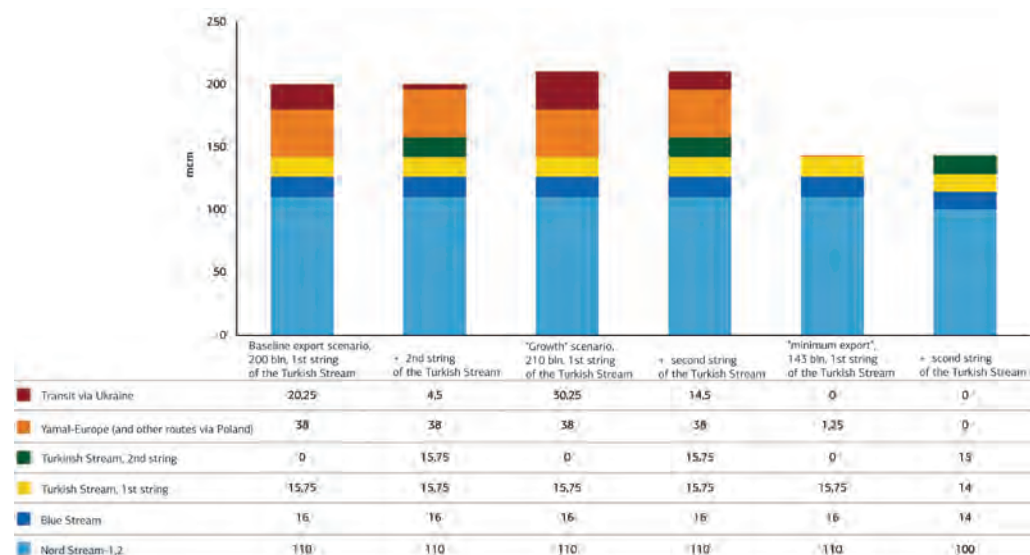
Of course, this is a «zero approximation». Moreover, there is a need for more capacities, taking into account the minimum safety/durability margin: in the case the gas pipelines cannot be operated above the design capacity constantly.

A calculation of gas pipeline design capacity generates a figure of over 16 bcm of Ukrainian transit which will be needed. Capacity of the existing and the most likely pipelines bypassing Ukraine will be

179.75 bcm: Nord Stream 1 and 2 (2 gas pipelines of 55 bcm each), gas pipelines through Belarus (38 bcm), Turkish Stream (the 1st string - 15.75 bcm), Blue Stream (16 bcm). Under the baseline scenario, where Gazprom's exports to non-CIS countries total 200 bcm (at the level of 2018), it is necessary to somehow ensure transportation of another 20 bcm (i.e. 4 bcm more - a figure by which Nord Stream exceeds its design capacity). Such a simple comparison of European exports with Ukrainian transit is possible without taking into account exports to Finland. «Minus 3 bcm» of gas to Finland (included in Gazprom's European exports but not using transit pipes) is offset by «plus 3 bcm of gas for Moldova (transit is used, but not included in European exports within Gazprom's accounting system).

As we can see from the approximate estimates above, up to 20 bcm of Ukrainian transit is needed just to ensure export volumes remain at the level of 2018. This will be the case not only until the 2nd string of Turkish Stream has been constructed. Even after the commissioning of the second string, the need for Ukrainian transit will remain (Figure 2).

Figure 2 Transit through the Ukrainian corridor by 20125 under various scenarios



Source: SKOLKOVO Energy Centre

Besides this we need to consider the factor of irregularity of supplies, as well as the need for at least some provision for safety/durability. In other words, the very 40 bcm of annual gas transits which Ukraine is calling the necessary minimum [4] for the economically viable operation of GTS, which can become a starting point for trilateral negotiations.

Russia's position on the issue of transits via Ukraine has been changing: from plans to stop transits through Ukraine altogether in 2015 [5] to plans to limit transit volumes to 10-15 bcm of gas a year [6].

Alexey Miller has already stated that the launch of Nord Stream-2 will be strictly on schedule, from January 2020. At the same time, we should remember that even if both offshore strings of Nord Stream-2 are launched on time, only one onshore string which will serve as the

onshore extension of Nord Stream-2 will be launched (the Eugal gas pipeline, which will run parallel to the existing Opal gas pipeline; for details, see section 3). A press release from Gascade, Eugal's operating company, states that parallel construction of two gas pipeline strings is underway at one of the sections. However, work will only be completed by the end of 2020. [7]

It follows that in 2019 and up to January 2020 negotiations should in fact deal with two new agreements:

- A medium-term contract (large volumes), for the period of completion of onshore sections to extend Nord Stream-2 and the second line of the Turkish Stream. It is possible that during this period the Ukrainian GTS will be rebuilt and fundamental decisions on its long term future will be made .
- A new long-term contract (with a smaller volume), and more likely - preliminary agreements which will take into account the interests of all three parties and will allow to keep Ukraine's GTS while taking into account necessary long-term investments, long-term obligations in respect of gas flows and guarantees.

In the end the parties may come to more complex schemes with minimum «basic» volumes, transit costs for which will be calculated at one tariff and several «steps» of additional seasonal and peak volumes with higher specific tariffs but without any obligations on volumes. In any case, in the period after 2019, Gazprom is interested in using short-term transit agreements to the maximum in order to be able to maneuver. This is especially the case given the plans to build the Turkish Stream onshore extension (2nd string), which will instantly reduce the need for the Ukrainian direction by 15.75 bcm annually.

SECTION 2. GAS DEMAND IN EUROPE

Projected demand for Russian pipeline gas in the EU is one of the most important factors of uncertainty in forecasting the required transit capacities. Here we can highlight the following aspects:

- The rate of decline in European gas production and gas demand in the EU ;
- The ratio between LNG and pipeline gas imports in the European market. For example, demand for Russian pipeline gas will decrease when oil is expensive and there is a surplus of LNG in the global market, and it will grow given a reverse situation (a shortage of LNG routed to the Asia-Pacific Region and relatively inexpensive oil).
- Political readiness of European countries to exceed a certain threshold of dependence on Russian pipeline gas;
- Competition between gas and renewable energy within the framework of the EU climate strategy.

Two years ago, it was difficult to predict exports reaching 200 bcm. However, a sharp increase in demand for LNG from China (rapid growth for two consecutive years, in 2017 - by almost 50%, in 2018 - by 43%) supported global LNG demand and took free volumes to Asia. A drop in production at the Groningen field in the Netherlands due to the threat of new earthquakes reduced internal European production. At the same time, demand for gas in the generation increased against the backdrop of a five-fold increase in prices in the European hydrocarbon market. As a result, Gazprom is showing new export records.

A detailed analysis of prospective supply and demand in the European market is beyond the scope of this work, therefore we are restricting ourselves to rough estimates. If you make an estimate from bottom to top, the minimum required volume of pipeline capacity can be assessed within obligatory deliveries under long-term contracts. Their volume is gradually decreasing, and by 2025, when all new pipes are guaranteed to be completed, the volume of Gazprom's European contracts will be 143 bcm.

Thus, taking into account the gas pipelines under construction, by 2025 Gazprom will be able to transport all the available contract volumes bypassing Ukraine (if we speak in terms of combined capacity). However, at present, the company's tactics involve maximizing gas exports to the EU, and therefore it is necessary to make a top-down estimate.

Demand projections for Russian gas vary greatly. A common denominator is the fact that by 2020-2021. we could even see a drop in export volumes (or no strong demand growth) due to a temporary surplus of LNG in the market (or at least no shortage).

Our conservative estimate suggests that the EU is not ready to further significantly increase its dependence on Russian supplies of pipeline

gas. Most industry experts believe that it will be LNG that will be responsible for most of the supply which meets new demand in the European market. [8]. A 5% increase in exports, to 210 bcm is a likely top-down estimate.

Thus, by the start of 2025 Gazprom's exports could vary greatly, depending on different scenarios - from 143 bcm (while maintaining the existing contract volumes and without developing other forms of trade) and up to 210 bcm given a moderate increase in export volumes.

In the first scenario, Gazprom will be able to completely abandon the Ukrainian transit and in the second one the need for the Ukrainian corridor will remain even following the launch of all diversification gas pipelines (Figure 2). Note that these are combined estimates of gas transmission capacities. In fact, infrastructural constraints do not always make it possible to «reach» all countries with new pipes, so it is only possible to use total volume of gas transmission capacities in analysis only in the first approximation. This issue is discussed in more detail below.

SECTION 3. TWO TRANSIT ROUTES: SOUTHERN AND WESTERN

Russian gas transits through Ukraine via two routes which do not overlap: the so-called «southern» and «western» transit routes. The Southern route (GMS «Orlovka», Ukraine-Romania) provides gas transit to Romania, Bulgaria, Turkey and Greece. Gas is delivered to the remaining countries via the western route, with four exit points - to Slovakia (the main transit route), as well as to Poland, Hungary and Romania (Figure 3).

Figure 3 The Ukrainian GTS and various transit routes



Source: Ukrtransgaz, SKOLKOVO Energy Centre

The parameters of the main gas measuring stations (GMS) at the exit from the territory of Ukraine are given in a table (Attachment 1).

The southern route (Turkey, Bulgaria, Greece) vs. Turkish Stream

Russian gas flows to the west of Turkey, to Greece, Bulgaria and Macedonia via the southern direction (exit at the Orlovka GMS to Romania), and further along the trans-Balkan gas pipeline (Figure 4). Three gas pipelines with combined capacity of 26.8 bcm a year carry gas via the southern route. However, these days around 18 bcm of gas a year is transported via these pipelines. Most of this gas is intended for Turkey (around 12 bcm), with an average of 3 bcm going to Bulgaria and Greece. Just over 1 bcm is routed to Bulgaria, but this country may move away from Russian gas imports in the mid-term. Gas deliveries to Macedonia do not exceed 70 mcm per year.

Turkey already receives gas directly via the Blue Stream gas pipeline (15.9 bcm in 2017, design capacity 16 bcm).

The first string of the Turkish Stream is scheduled to come online in January 2020 (by the time that the contract with Ukraine expires).

Following the launch of the first line of the Turkish Stream with a capacity of 15.75 bcm per year Turkey will receive «its» volumes via this route. Therefore the southern route of the Ukrainian transit will only be utilized for 6-7 bcm of gas a year - for transportation to Greece, Bulgaria and Romania.

Figure 4 Gas flows via the southern route



Sources: ENTSOG, SKOLKOVO Energy Centre

At the same time, the second string of the pipeline was completed as early as November 2018. Although the issue of constructing its onshore extension remains open (discussed in more detail below), theoretically, it can also be used as early as 2020. For example, it could be used to cover seasonal fluctuations in demand.

Moreover, in one or two years' time, Greece and Bulgaria will start receiving 1 bcm of gas a year each from Azerbaijan. On the one hand, this means additional diversification for these countries. On the other hand, utilisation (loading) of corridor transit capacities will fall from the current 18 bcm to 4-5 bcm a year without these 2 bcm of transit. In any case, following the launch of the Turkish Stream pipeline (the 1st string), utilisation of the transit capacities on the southern route will drop many-fold. The only question is whether utilisation (loading) will halve (the most optimistic scenario) or fall 3-4 fold within a more pessimistic scenario. It is important to observe these developments as

it will be clear in the near future how Ukrtransgaz plans to modify the gas transportation system. The options are to shut off one or two gas lines or compressor stations, which will reduce transportation costs. At the same time, Ukraine needs to maintain the GTS on the southern route to meet its domestic needs, which complicates the situation.

The western route vs. Nord Stream-2

On the western route, export is transported in four directions: Slovakia as the main direction (GMS «Uzhgorod» (Ukraine) - «Velke Kapushany» (Slovakia), as well as Poland, Hungary and Romania. The launch of the Nord Stream-2 gas pipeline is expected to replace part of the transit on this route. Shell, ENGIE, Uniper, OMV and Wintershall finance 50% of the project (9.5 billion Euros), while Gazprom will remain the sole shareholder of Nord Stream 2 AG, the project company. As of December 2018, 300 km (of 1224 km) of the offshore section of the gas pipeline was laid.

The Eugal gas pipeline is being built to continue transportation across Germany (Figure 5). It will run along the majority of the route parallel to the existing Opal gas pipeline (transporting the bulk of the Nord Stream gas) [9]. Eugal's capacity is 55 bcm of gas per year. Gastransport (a JV between Gazprom and Wintershall) is the project operator. This JV also owns a 50.5% stake in the project. The remaining part was

Figure 5 Eugal gas pipeline: an extension of Nord Stream-2 across Germany



Sources: Eugal.de, SKOLKOVO Energy Centre

shared by three more shareholders: European gas operators Fluxys Deutschland GmbH, Gasunie Deutschland Transport Services GmbH and ONTRAS Gastransport GmbH in equal stakes (16.5% each). As noted above, construction of Eugal is being delayed - both lines are guaranteed to become operational by the end of 2020. One of them could be commissioned a little earlier.

Turkish Stream, 2nd string

The second string of the Turkish Stream gas pipeline stands apart. The construction of the offshore part was already completed in November 2018, but its onshore part still remains a subject of debate. Even given a favourable development of events, the launch of this route is not possible before 2022. The exact route of the onshore extension of the gas pipeline through Europe is unknown, several options are being considered:

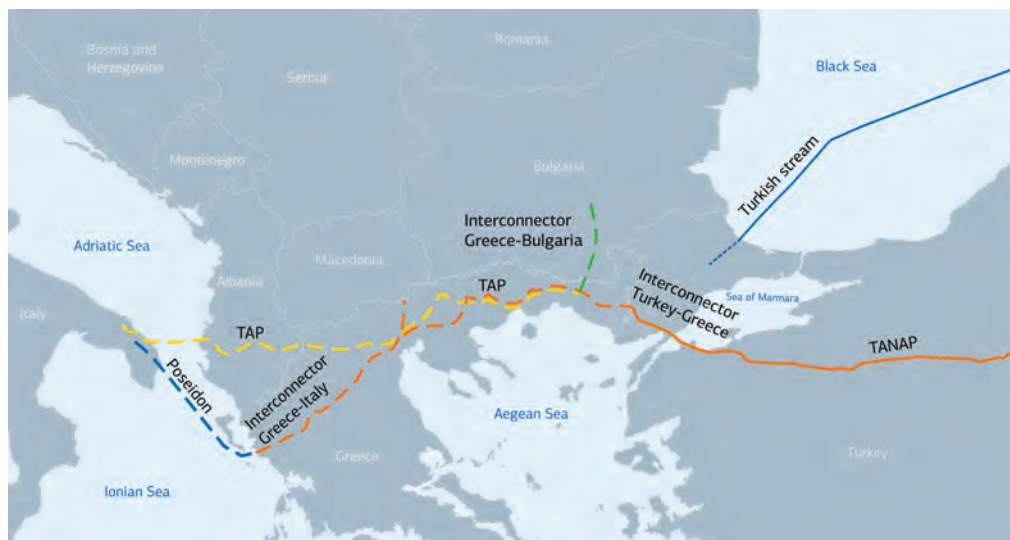
- The «Turkey-Bulgaria-Serbia-Hungary-Austria» route - in this case, the gas pipeline will largely repeat the route of the cancelled South Stream. It can be noted that, according to recent statements, this route is the most likely one. Gazprom Export has announced that it may consider taking part in the open season for incremental capacity on the project, booking volumes for GTS Bulgaria capacity. [10]
- The route through the territory of Greece, ending in southern Italy.
- Another option to use the second string of the Turkish Stream (and / or a small part of the volumes of the first string, which are not used in Turkey) is to reverse the Trans-Balkan gas pipeline (see Figure 4). This will allow to use the existing infrastructure to deliver gas to all countries on the southern route of the Ukrainian transit: Greece, Bulgaria, Romania. This option has been on the table for a long time, but it has not been spoken about explicitly lately. If this option is implemented, Gazprom could completely shut the door on the southern route of the Ukrainian transit by 2020 or slightly later - when the minimum necessary infrastructure has been constructed. Another reason Gazprom could move away from transit on the southern route is the risk of a higher transit tariff from Ukraine, prompted by a manyfold decline in flows on this route.

The Minister of Energy Alexander Novak has already stated that Gazprom is discussing possible cooperation with Italian Snam, linked to the implementation of the Turkish Stream project. In February 2016 the head of Gazprom A. Miller, as well as the leaders of Italian Edison and Greek DEPA signed a «the Memorandum of Understanding on natural gas deliveries from Russia across the Black Sea and third countries to Greece and from Greece to Italy». As reported, the parties intend to use the results of the work carried out by Edison and DEPA within the ITGI Poseidon project to maximum (Figure 6). On October 24, 2018 V. Putin stated that

Moscow and Rome are exploring options to link Italy up to the Turkish Stream gas pipeline. [11]

- It is also possible to connect the second string to the TAP gas pipeline (10 bcm per year), which will transport Azerbaijani gas to Italy, since it is possible to expand capacity of this pipeline to 20 bcm.

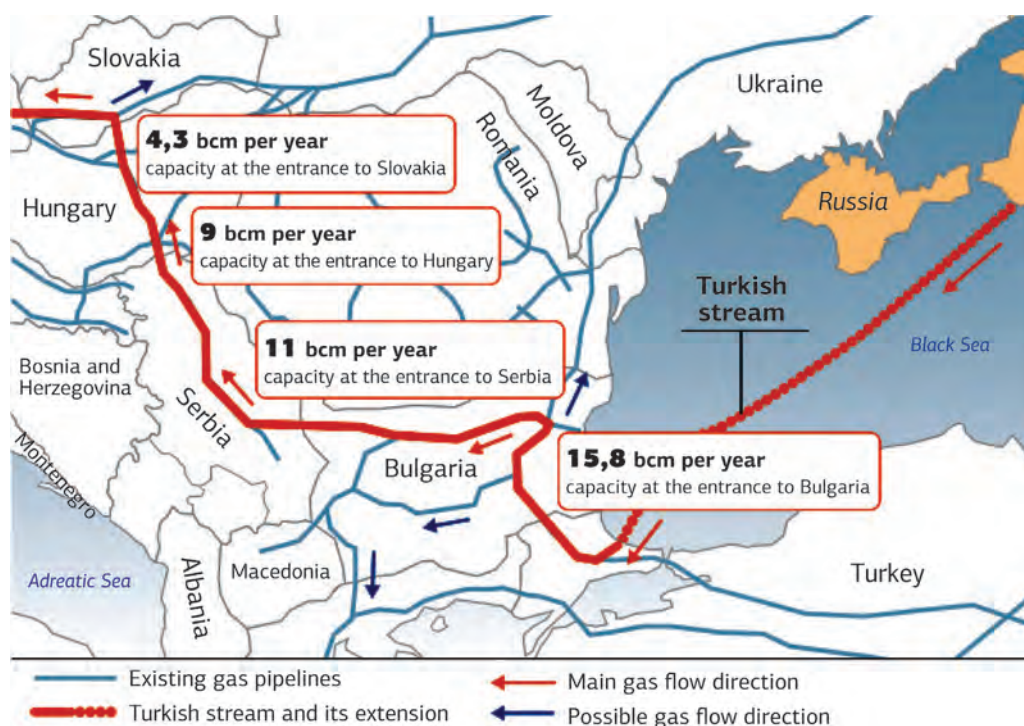
Figure 6 Some active and planned pipeline projects in southern Europe



Source: edison.it, ENTSOG, SKOLKOVO Energy Centre

Against this background, on November 22, 2018, there was a publication in the Kommersant newspaper [12] which reported that Gazprom has already chosen the route that will pass through Bulgaria, Serbia, Hungary and Slovakia (Figure 7).

Figure 7 Potential route of the onshore extension of the 2nd line of the Turkish stream project



Source: «Kommersant»

On the same day the Ministry of Energy of Bulgaria announced [13], that it had not received any official notification on Gazprom's plans to extend the pipeline route. Construction of the onshore extension would be done according to the new rules: construction would be handled by gas transportation operators of the countries in question, while Gazprom would guarantee the necessary flows.

In any case, so far the intrigue of the second string of the Turkish Stream remains. Both options for the extension of the Turkish Stream have their pros and cons. The option of laying the pipes to Italy allows to supply part of gas volumes under a contract with Italy using a smaller transportation leg (compared to Nord Stream 2). In this case, this route will replace part of deliveries to Italy via Nord Stream 2, freeing up some volumes on the northern export route, where prospective demand growth is more likely. However, in this case, gas deliveries to the Balkans (primarily to Serbia) remain uncertain. The construction of the second string within the second option (with access to Bulgaria) resolves these issues (for more details, see the next section).

Small consumers on the western route

If the option of an exit point of the Turkish Stream (second string) to Italy, rather than to Slovakia, is chosen, then the issue of gas supply to several small consumers of Gazprom in Eastern Europe and the Balkans (Serbia, Bosnia and Herzegovina, Croatia) remains problematic. Total volume of supplies to these markets is about 5 bcm per year (Bulgaria can be connected using reverse flows of the existing transport corridor). However, Croatia could be connected from the side of Italy. [14], [15].

Currently this region is supplied using the Ukrainian corridor through Hungary, with Hungary itself receiving most of its gas from Ukraine (total exports to Hungary of 5.8 bcm at the end of 2017). In the coming years, this particular group of consumers will provide a significant part of demand for transit gas through Ukraine (in addition to peak volumes deliveries and additional volumes in the event of growing demand).

Theoretically, if the Ukrainian transit were to be completely abandoned, it would be possible to make «reverse» deliveries to the region through the western borders of Hungary and / or the northern part of it. However, it will probably take some time to remove the bottlenecks in the new configuration (Figure 8).

Figure 8 Gas deliveries to south-eastern Europe

Sources: ENTSOG, SKOLKOVO Energy Centre

The situation with Moldova stands apart. Moldova is currently supplied with gas via Ukraine, practically without any alternatives. The possibility of supplying Moldova with gas from Romania was already discussed in the autumn of 2018, however, it appears that it is important for Gazprom to retain its own deliveries to this country.

Thus, for a number of small consumers in southern and central Europe, uncertainties regarding supply routes remain.

At the same time, new gas routes will add flexibility to the system if the Ukrainian corridor is maintained. For example, if the second string of the Turkish Stream is routed to Italy, this country will theoretically be able to receive gas in three ways at once: in addition to the Turkish Stream, via the Ukrainian corridor and via Nord Stream 2

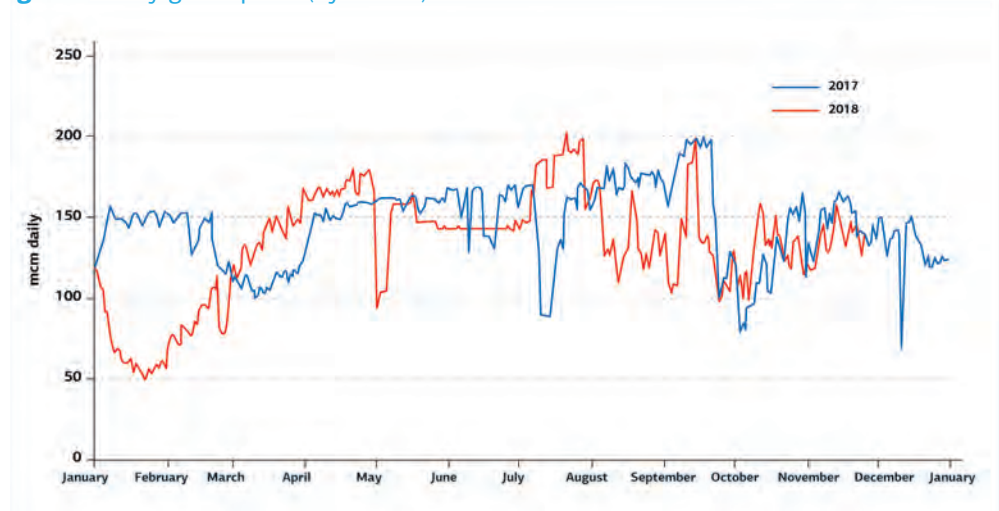
SECTION 4. SEASONAL VARIATION IN TRANSIT

As noted above, Gazprom loads all diversification gas pipelines to maximum, using the Ukrainian route to cover peak volumes. This was made possible thanks to the 2009 agreement, in which there was no explicit «pump-or-pay» condition, and the minimum required pumping volume was described ambiguously. (In 2018, the Stockholm arbitration deemed that the «pump-or-pay» condition should have been applied and charged penalties, but this dispute is not yet finalised).

Understandably, Naftogaz of Ukraine is not enthusiastic about this situation, but a sufficiently large amount of transit revenues (2 billion US Dollars per year), coupled with the already depreciated GTS, made it possible to receive sufficient revenues even given such inefficient functioning of the GTS.

Transit fluctuations reached up to 150 mcm daily (from 50 to 200 mcm, see Figure 9) in the last two years on the main western export route alone (Ukraine-Slovakia).

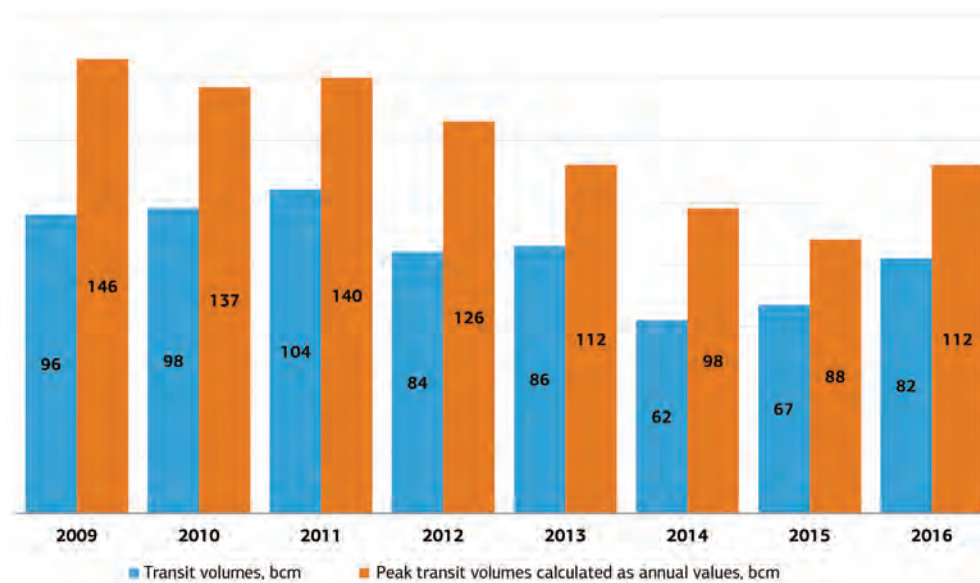
Figure 9 Daily gas exports (dynamics) via the Slovak corridor



Source: eegas.com based on Eustream data.

Probably, fluctuations do not always reflect changes in gas demand in the EU due to weather conditions (for example, in January 2018, transits were unprecedentedly low), but also Gazprom's trading tactics in the European market. But even if we were to ignore the «extreme» cases, 50 mcm per day mean a reserve of gas transmission capacity of 18 bcm per year!

Indeed, in recent years peak transit volumes (calculated as annual values) have differed from volumes pumped annually on average by 35 bcm.

Figure 10 Russian gas transits via Ukraine

Sources: Naftogaz of Ukraine presentation, naftogaz-europe.com, SKOLKOVO Energy Centre

Seasonality of supplies can also be observed on the southern transit route. However, given that the second string of the Turkish Stream is not yet operational, it could be used to cover peaks for now. In the long term, when gas from the second string has found the end consumer in Europe, this problem could become manifest.

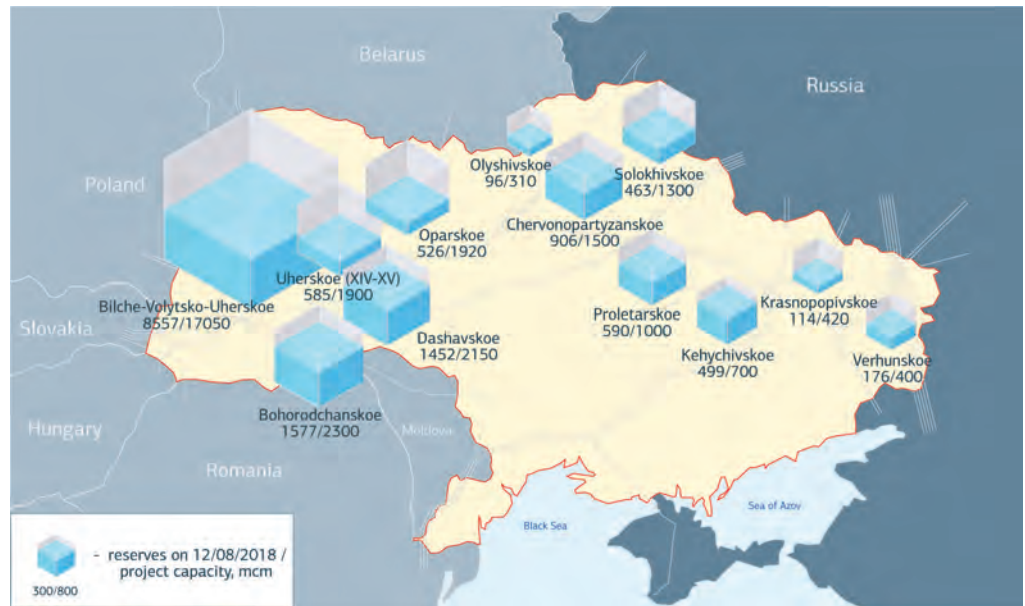
These factors make it relevant to utilize the Ukrainian corridor to cover seasonal peaks.

Theoretically, European underground storage facilities could also be used to smooth out supply irregularities. According to Gazprom's annual report in 2017, the company's gas storage facilities in European far abroad countries totalled 5.03 bcm of capacity, daily output - 83.3 mcm of gas. In 2017, 8.6 bcm of gas was pumped into underground gas storage facilities of European far abroad countries. Total gas withdrawal reached 4.3 bcm (in the winter of 2017-2018, the figure for withdrawal from UGS in Europe was even higher - over 7 bcm) [16]. In other words, Gazprom is really utilizing this opportunity. But these volumes are already taken into account within its current operations. According to GIE, in recent years European UGS have been filled up to around 90% prior to the heating season and around 10 bcm remained free. Therefore certain opportunities remain for increasing the use of European UGS to manage uneven demand. Nevertheless, the optimum solution for the operation of the Ukrainian GTS and covering seasonal peaks in the face of a reduced load would be the active use of Ukrainian UGS facilities.

SECTION 5. THE FUTURE OF UKRAINIAN UGS

The official capacity of UGS facilities in Ukraine is 30.95 bcm. 12 underground gas storage facilities currently function in Ukraine. The largest of these are located closer to the western border, including the largest of these - Bilche-Volytsko-Uhorskoe (with 17 bcm of capacity) - Figure 11. This location allows to quickly withdraw additional gas volumes in case of an increase in gas demand in the EU, for example, linked to a sharp drop in temperatures.

Figure 11 Underground gas storage facilities in Ukraine



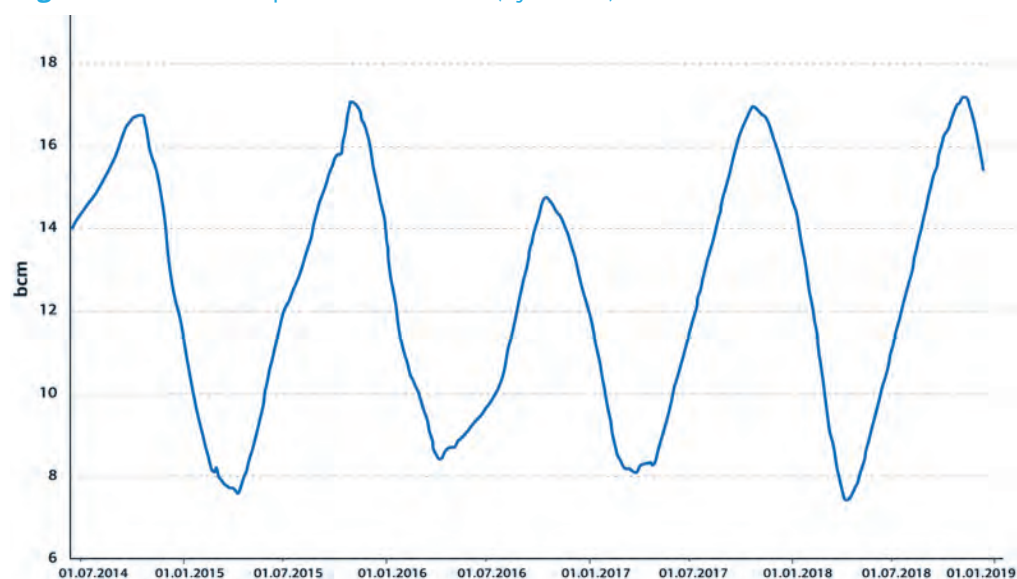
Sources: naftogaz-europe.com, SKOLKOVO Energy Centre

To understand the picture better, it is necessary to mention several other aspects. Firstly, Gazprom does not pump its gas into the UGS of Ukraine. This does not exclude the possibility that, in the winter, as part of optimization within the GTS, Ukrtransgaz could lift gas from UGS for exports to Europe. Meanwhile Russian gas declared for transportation would remain in the eastern and central regions of Ukraine for its domestic consumption).

Secondly, it is known that part of buffer gas (technical gas, which cannot be lifted without consequences for the operation of the underground gas storage, i.e. which cannot be used) is accounted for in the volumes of operational gas. This volume is 4.9 bcm, a figure that was reported as far back as 2015 by the head of Naftogaz of Ukraine based on audit results. [17]. It is therefore necessary to deduct this amount when estimating actual gas reserves in UGS. This explains the fact that, despite the well-known problems and gas shortages, the minimum amount of gas in underground gas storage in recent years has been reported to be over 5 bcm (Figure 12). Note that apparently we are talking about only some of the buffer gas, taken into account in working volumes, since the standard volume of buffer gas is about 50% of the total volume

stored in the UGS. Therefore, combined UGS capacity goes down from 31 to 26 bcm when you do not include buffer gas. In any case Ukraine is not using its UGS facilities to their full capacity.

Figure12 Rate of fill-up of Ukraine's UGS (dynamics)¹



Source: utg.ua

At present the UGS of Ukraine is to a greater extent used as a backup function for its domestic needs. If Naftogaz of Ukraine did not have a working capital deficit, the capacity of UGS would be enough to pump all the volumes of gas that Ukraine needs in the winter period by «reverse» in the summer. This would avoid dependence on the possibility of «reverse» deliveries in the winter, even if there were no imports from Russia.

One of the initial functions of UGS is to ensure flexibility of gas supplies to the EU in the winter period. Ukrainian storage facilities do not perform this function or do that to a minimum extent. At this point it is appropriate to discuss the configuration of the GTS in the new conditions.

Given decreasing transit volumes, capacity of the Ukrainian GTS allows for flexible deliveries thanks to surplus gas pipeline capacities. However, in the next decade Naftogaz of Ukraine will inevitably have to reduce the total capacity of the GTS, since it will not be viable to maintain «excess capacity» considering lower flow volumes, as is the case now. In this case, it is the UGS of Ukraine that will prove to be a tool providing flexibility of supply and meeting peak demand from European consumers.

Who will pump the gas into UGS facilities remains a separate issue. Will this be just Naftogaz of Ukraine (more precisely, new companies which will be separated out after unbundling - separation of gas transmission and production functions) or all market participants?

1 including buffer gas, to see actual figures we need to deduct 4.9 bcm

In April 2016, Naftogaz of Ukraine already offered traders to pump gas into Ukrainian UGS facilities. Amendments to legislation were made [18], and gas transmission capacities were allocated for this purpose. Guaranteed capacities at the Budintse point towards Europe totalled 19 mcm per day. That is, for example, it is possible to withdraw around 1.8 bcm of gas from UGS with a shipment to Europe in the three winter months.

In September 2018 Naftogaz of Ukraine reported that Polish PGNiG, which in particular delivers reverse flow supplies to Ukraine, extended the contract for gas storage in Ukrainian UGS facilities. It is expected that contracts will also be made with some other traders [19]. At the same time, there were no specific reports of a Polish company storing gas in Ukrainian UGS facilities. According to media reports, in the heating season of 2017-2018, three traders from the Netherlands, the Czech Republic and Switzerland already stored gas in Ukrainian UGS [20]. However, at the moment we are probably talking about relatively small pilot volumes: the volume of injection into the UGS facilities of Ukraine in recent years has not changed significantly (see Figure 12).

Currently, tariffs on underground gas storage are very small. Combined cost of injection, storage during the season and withdrawal is only 112 hryvnia / 1000 cm (around 4 US Dollars/1000 cm). [21]

SECTION 6. «REVERSE» GAS SUPPLIES TO UKRAINE – CURRENTLY AND IN THE FUTURE

The subject of this paper is the future of gas transit, not Ukraine's gas supply. The gas transit agreement and the gas supply agreement are currently independent of each other. There is no doubt that this will remain the same in the future. Nevertheless, the presence or absence of gas exports to Ukraine from Russia will affect both the functioning of the GTS and transit terms.

Starting November 2015, Ukraine does not purchase gas from Russia directly. This was made possible because there was a reduction in consumption on the demand side, due to the economic downturn. The necessary supply is provided by three sources:

- Domestic production (over 20 bcm per year). As a result, Ukraine has enough of its own gas in the summer;
- In the winter, gas from UGS is actively used;
- Necessary gas imports (although in smaller volumes) - for injection into UGS in the summer and to cover additional demand in the winter. Imports are carried out by reverse flow from European countries.

There are currently three reverse routes. The main route is the Slovak one (capacity - 41 mcm daily, or nearly 15 bcm of gas per year). There are also «reverse flows» from Poland and Hungary (see Table 1). The launch of reverse supplies from Romania is also being discussed.

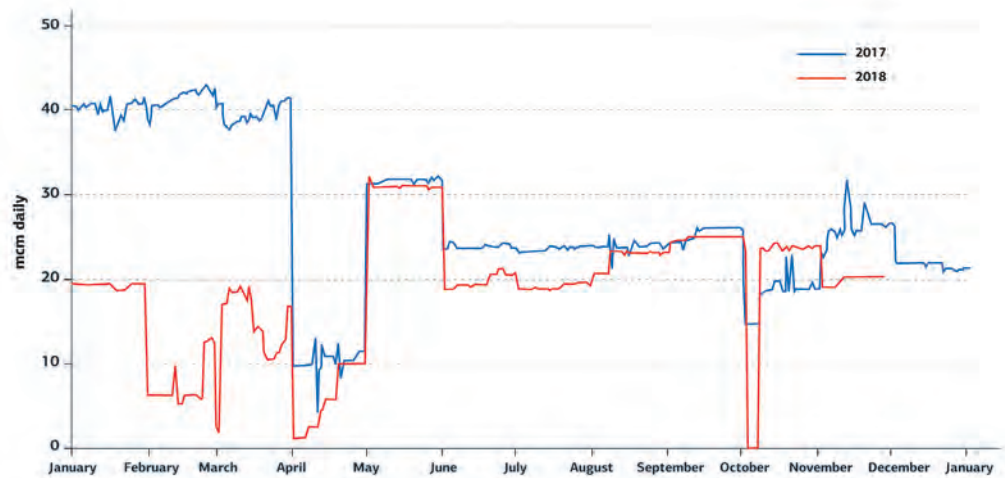
Table 1 – Reverse gas supplies to Ukraine

Gas measuring station	Capacity, bcm/year	Capacity, mcm daily	Actual import as of 02.12.2018, mcm
Budintse (Slovakia)	14,9	41	7,34
Germanovichi (Poland)	1,6	4,5	1,51
Berge Darts (Hungary)	2,7	7,5	7,01

Sources: utg.ua (current import), media reports, SKOLKOVO Energy Centre

The Slovak route remains the main reverse flow route, although it is not being used to full capacity in recent years. (Figure 13).

Figure 13 Reverse gas supplies to Ukraine from Slovakia (Budintse gas measuring station)



Source: eegas.com (according to Eustream data).

It is still being disputed as to what constitutes reverse flow gas. There may be at least two options here, and it is likely that each of them is being used to some extent.

The first is the case of real reverse «anonymous» gas coming from Europe, in particular - from the gas hubs of northwestern Europe. Prices for deliveries are set by European traders precisely on this basis: the cost of gas at European hubs plus delivery. However, in reality, only an insignificant part of the gas is delivered via this route.

The second and the most likely option is when Russian gas crosses the western borders of Ukraine and comes back immediately. An analysis of cross-country gas flows shows that in certain periods gas volumes flowing into Slovakia from the west turned out to be less than the volume of reverse supplies to Ukraine. In other words, these volumes of gas from Europe simply did not get to Ukraine, which unequivocally points to this option of reverse.

All these schemes have to be applied, since there is no possibility of a virtual reverse within the existing system of relations between the seller, the buyer and the gas transit country. If in future, after 2019, such an opportunity does appear, Naftogz Ukraine will officially be able to physically take some of the gas sold by Gazprom to European buyers already at the eastern border. This would be the case even if there is no contract for gas deliveries from Russia to Ukraine. Naftogaz of Ukraine would do this by agreement with the European trader. This is already happening, for example, with some of the gas volumes in the territory of Poland during the transit to Germany via the Yamal-Europe gas pipeline.

In any case, the issue of gas supply to Ukraine and options for reverse supplies are directly linked to transit. For instance, in the case of transit volumes falling to minimum, when they are only sufficient for those European consumers who cannot be reached with diversification pipelines, any option of reversing Russian gas flows (which came to Europe from Ukraine) would be impossible.

On the other hand, at least 11 bcm of gas which Ukraine imports annually by reverse, increase both the volume of Gazprom's exports to Europe and Ukrainian transit volumes.

SECTION 7. GAS TRANSPORTATION TARIFFS

New tariffs for gas transit through the territory of Ukraine starting 2020 are another key issue for future negotiations.

Comparison of total gas transportation cost in the EU depends on the level of load on diversification routes (primarily Nord Stream) and, most importantly, on the final destination in Europe. It is a subject of heated discussions (see, for example [22], [23]). However, if the Nord Stream gas pipeline were to be loaded to maximum capacity, transporting Russian gas to the markets of northwestern Europe via Nord Stream appears to be more profitable compared to the Ukrainian transit corridor: the tariff for sending gas through Nord Stream (at full capacity) is 2.2 US Dollars/1000 cm³ / 100 km of transit. [24], The tariff for Nord Stream – 2 is expected to be at the same level, compared to a tariff of 2.7-3 US Dollars/1000 cm³ on the Ukrainian route (more details below). Besides, Nord Stream is shorter than the route across Ukraine (1224 km vs 1240 km). Finally, shifting Russian gas production centres to the north, to the Yamal Peninsula, will cut transportation expenses across Russia. This would be the case if the so called «northern corridor» is used. It delivers gas to North Stream and comprises gas transportation systems of Bovanenkovo-Ukhta and Ukhta-Torzhok.

In any case, these comparisons have limited applied value, since under comparable price conditions for transportation, Gazprom will always choose new gas pipeline networks. The conditions of «pump-or-pay» and / or direct participation of Gazprom in the ownership of diversification gas pipelines means that it is economically profitable for the company to load its «own» gas pipeline systems. This is because capital construction depreciation expenses make up most of the transit cost structure.

It was precisely this collision which prompted court proceedings with Naftogaz Ukraine because the «pump or pay» clause was only stated implicitly. As a result, Gazprom loaded the Ukrainian direction on a residual basis, after the rest of the routes had been fully loaded: Nord Stream, Blue Stream, Yamal-Europe. But it is clear that there will no longer be any flexibility in the new transit agreement, if it is signed, that is so convenient for Gazprom.

In any case, the current tariff for pumping gas across Ukraine can be considered as the starting point for future negotiations. This tariff turns out to be comparable (or slightly more expensive) to the tariff for pumping gas via alternative routes.

The tariff for gas transportation through the territory of Ukraine is calculated using a rather complex formula (it became known after the signed contracts were made public), This formula includes a fixed component (2.04 US Dollars / 100 km / 1000 cm³), where half of this

component is indexed as inflation in the EU) and the fuel component. Taking into account inflation in the EU in recent years, the fixed component has increased to 2.14 US Dollars / 100 km / 1000 cm, according to our calculations.

The fuel component is calculated monthly using the following formula:

$K = (\text{Gas price for Ukraine} \cdot 0,03) \cdot 100 / 1240$ (transportation distance specified in the contract).

For example, with the price of gas at 300 US Dollars/ 1000 cm, the fuel component will equal 0.73 US Dollars / 100 km /1000 cm, and the total cost will be 2.87 US Dollars / 100 km / 1000 cm.

Therefore the cost of transiting 1000 cm of gas via the territory of Ukraine is, as a rule, limited to 3 US Dollars / 100 km threshold. Although given high gas prices for Ukraine (as in 2012, for example), transit tariff 3.11 US Dollars / 100 km / 1000 cm [25].

The figure of 3 US Dollars/100 km/1000 cm can be considered as a starting point for negotiations. In recent years while preparing for 2020 negotiations Naftogaz Ukraine repeatedly voiced its own, sometimes contradictory proposals on tariffs.

Starting January 2016 Naftogaz Ukraine unilaterally increased gas transportation tariffs for the use of the GTS. The tariffs were radically changed and made closer to the European systems, the so called «entry-exit», where transit cost is made up from payments for entering and leaving the GTS.

Payment for «entry», was set at 12.47 US Dollars / 1000 cm for all entry points . For exit points, it was set from 16.7 to 32.8 US Dollars / 1000 cm. The exit tariff for the most important transit direction, Uzhgorod, reached the maximum of 32.8 US Dollars / 1000 cm, combined transit cost in this case would be $32.8 + 12.47 = 45.27$ US Dollars / 1000 cm for the entire route.

Thus, the cost of transit increased by a minimum of 22% compared to tariffs set in the 2009 agreement (even if we adopt the tariff at the upper threshold of 3 US Dollars / 100 km / 1000 cm, we will get 37.2 US Dollars / 1000 cm for the entire route).

However, this unilateral tariff increase was not met with understanding not only by Gazprom, but also by Stockholm Arbitration, which decided to leave the transit fees under the current agreement, despite the fact that other rulings were not made in favour of Gazprom.

However, as soon as in June 2016, Naftogaz of Ukraine announced that the cost of transit in 2020 would be several times lower compared to the Nord Stream gas pipeline route. The explanation is as follows: before 2020, Naftogaz of Ukraine needs to fully depreciate the GTS (for which, according to the official version, the tariff was raised), which will later dramatically reduce transit costs [26].

In July 2018, Naftogaz Ukraine already submitted specific tariff proposals for the future. The tariff is expected to be significantly reduced from 2019; in terms of the usual values, it will amount to 2.17 US Dollars / 100 km / 1000 cm. [27] However, guaranteed flow volumes of 141 bcm will be the condition for such a low tariff. It is clear that in the current conditions Gazprom will not commit to this volume of transit.

Finally, in November 2018, the national regulator (NERC) approved a draft decree specifying a reduction in tariffs in the entry-exit system approximately by half from January 1, 2019 [28]. For all entry points the suggested tariff is 6.04 US Dollars / 1000 cm (previously 12.47 US Dollars / 1000 cm), for the exit point of Uzhgorod – 16.88 US Dollars / 1000 cm (previously 32.8 US Dollars / 1000 cm). In this case, the cost of transportation for the entire route will be US Dollars 22.92. This is half the previous tariff in the entry-exit system (it is not used in the settlements between Gazprom and Naftogaz of Ukraine) and significantly less than the cost of transit within the current contract.

Theoretically, Naftogaz Ukraine can approach 2020 with this very price proposal. But this level of tariff looks comfortable and is likely to be compounded by the conditions for the volume of gas that has to be pumped.

There is one sound argument in these contradictory statements: the tariff should depend on the expected volume of gas flows. This problem is most likely to arise as soon as in 2020. Delays with switching to the gas diversification route are possible on the western route, and flow volumes will decline insignificantly. However, on the southern transit route, transit volumes will fall sharply as soon as the first string of the Turkish Stream has been made operational.

Therefore after 2020 we may see several innovations in the way transit tariffs are calculated:

- a likely transition to the «entry-exit» scheme, officially set within contracts;
- the appearance of a clearly defined «pump-or-pay» clause (or a clearly defined absence thereof);
- tariff disputes and / or final tariffs will depend on the volume of gas transported via the Ukrainian GTS;
- the emergence of mechanisms allowing to set up flexible pricing : for example, one tariff for basic flow volumes and another (higher) tariff for pumping peak volumes.

SECTION 8. POTENTIAL PARTICIPATION OF EUROPEAN IMPORTERS IN THE MANAGEMENT OF THE UKRAINIAN GTS

The European countries could play an important role in the new setup of gas transits via Ukraine by taking part in the management (ownership) of the Ukrainian gas transport system. This would enhance transparency of operations, as well as remove the risks of ownership of gas, which is especially important when Russian gas (originating from Russia) is stored in the UGS of Ukraine. It is no secret that the Ukrainian gas transportation system needs modernization: not only because of the expected decline in transit volumes, but also because of its long service life. The appearance of a strategic investor who would invest in the GTS with publicized investment amounts and an acceptable rate of ROI would make it possible to work out an economically acceptable and transparent tariff.

In April 2017, Naftogaz Ukraine, Ukrtransgaz, Snam S.p.A. (Italy) and Eustream a.s. (Slovakia) signed a Memorandum of Understanding on a joint assessment of potential cooperation in the use and development of the gas transmission system (GTS) of Ukraine. [29].

The interest of these European companies in maintaining maximum possible gas transits to the EU is understandable. The Slovak GTS is a «natural extension» of the western route of the Ukrainian transit, and with a decrease in gas flows through Ukraine, transit volumes across Slovakia will automatically fall.

Here we should note, however, that the Slovak operator Eustream has a contract with Gazprom on a «pump or pay» basis, valid until 2028. In addition, Gazprom plans to include the Slovak GTS in new gas transportation schemes. However, in any case, gas volumes will be lower. Slovakia is objectively interested in maintaining the Ukrainian direction of transit to maximum extent.

Italy, which, after the launch of Nord Stream-2, will be able to receive its gas via gas diversification routes, is interested in maintaining the Ukrainian corridor as the shortest route. This arrangement becomes especially relevant if it becomes possible to buy gas at the eastern borders of Ukraine.

Indeed, the option of buying a part of gas by importers on the eastern border of Ukraine may become another aspect of the transit configuration after 2019 i.e. we are talking about relocating the point of transfer and acceptance of gas. Let us recall that in the 2010s, this option was actively discussed by market participants. However, Gazprom has always opposed such an approach. There seem to be two reasons for this. Firstly, Gazprom has for many years focused on the strategy of delivering gas to the end user. But in December 2014, when Gazprom abandoned the construction of the South Stream, the head of the company A. Miller announced that Gazprom was changing its strategy regarding the European gas market [30]. At that point the statement was made in the context of a gas hub which was being

planned at the border of Turkey and Greece (i.e. sales of Russian gas at the hub). However, even in the context of changes in the EU gas market, the strategy of delivering all gas to final consumers already became irrelevant (especially since Gazprom had already taken the niche there - in 2015 the company became the full owner of the sales company Wingas).

The second reason why Gazprom preferred to sell its gas on the western borders of Ukraine (or directly in the EU) was the desire to keep Ukraine and the Ukrainian gas transportation system in its «influence zone». However, the political situation which has also changed drastically in this area speaks in favour of gas sales in the east.

It can be assumed that Gazprom is currently more interested in selling at least some of the gas on the eastern borders (provided that appropriate amendments are made to the existing agreements with end consumers of gas in the EU at the gas pick-up point).

In this case, the Ukrainian GTS will be largely integrated with European networks. At the same time, the Russian side will receive a higher level of reliability and transparency of operations. For the Russian side, the known risks associated with transportation through the Ukrainian gas transport system will also decrease.

Finally, gas sales at the eastern border are currently possible within the «EU prices minus» pricing : gas prices at European hubs (or EU prices with a tie to oil prices) minus transportation costs. However, in the long term, such a model will enable to set up an independent pricing center for export gas in the territory of Russia.

However, will European importers now want to switch to this model given a tense political situation in Ukraine? After all, currently the Russian exporter carries all the risks associated with delivery. So far, despite the statements about the importance of the Ukrainian transit, European buyers have not made any real steps to share these risks.

Finally, the active participation of companies from the EU in the management of the Ukrainian GTS and Ukrainian UGS would allow to solve problem of optimal use of residual transit capacity through Ukraine, since in this case, seasonal peaks could be covered with gas from underground storage facilities.

SECTION 9. OPPOSITION TO THE NORD STREAM-2 PROJECT

Construction of both new Russian gas pipelines to Europe faces opposition from a number of countries, including the United States. First of all, this applies to the Nord Stream 2 project.

Current sanctions should not affect the construction and operation of new gas pipelines, since back in October 2017, the State Department of the United States issued a clarification that the sanctions regime would not apply to pipeline projects initiated prior to August 2, 2017. [31] Nevertheless, US officials still regularly discuss the possibility of opposing the construction of Nord Stream 2. In July 2018, a draft bill on targeted sanctions in relation to the project was submitted to the US Congress. [32]. The statements of officials who are opposed to the project are also regularly made public. However, Nord Stream 2 is already under construction, and very likely will be completed.

A number of European countries also expressed opposition to this project, but only the countries in the Baltic Sea basin can influence the construction. In the general case, the route of Nord Stream 2 gas pipeline can lie both in the territorial waters (22 km) of a given country in the Baltic region and in the exclusive economic zone (370 km from the territorial waters). According to the UN Convention on the Law of the Sea, countries may refuse to lay a gas pipeline in their territorial waters, but they cannot do this within their exclusive economic zone. On the other hand, there are no other options to lay the pipeline, except in the exclusive economic zone of one of the countries (on the one or the other side of the Baltic Sea), as the Baltic Sea is not very wide.

Dissatisfaction with the construction of the gas pipeline was already voiced by the Swedish parliament (it is interesting that this happened after the construction permit had already been issued by the government). However, there is no legal opportunity to oppose the construction: the gas pipeline route lies within the country's exclusive economic zone.

On the contrary, in Denmark, the initial route of the gas pipeline passed in the territorial waters, and this country did not issue a building permit. As a result, in the summer of 2018 it was reported that the route of the pipeline would be changed so that it would not get enter Danish territorial waters [33].

It is believed that the United States and a number of European countries are objecting to the construction of diversification pipelines in order to preserve maximum transit volumes through Ukraine, and thereby economically support the country, and also not to jeopardize Europe's energy security (although it remains unclear what constitutes a threat to EU energy security in the case of expansion of supplies through the Baltic).

At the same time, a number of observers point out another informal reason for opposing construction. This is the desire of some of the American leadership to limit Russian gas supplies to Europe in order

to create additional markets for American LNG. Germany has already announced plans to build its own LNG terminals, which some observers see as a concession to the United States «in exchange» for not resisting the construction of Nord Stream 2. Currently, there are projects of LNG terminals in Germany with total capacity of 25 bcm. This is slightly less than the capacity of one string of the Nord Stream gas pipeline (after the completion of the construction of Nord Stream 2, the combined capacity of two gas pipelines will be 110 bcm).

In any case, when Nord Stream 2 has been built and deliveries via the pipeline reach full capacity, it will be possible to significantly restrict the volume of Russian gas exports to the EU only by minimizing transits along the Ukrainian corridor. After the launch and full utilisation of Nord Stream 2, these two interests of the United States (maximizing Ukrainian transit and minimizing Russian exports to the EU) will contradict each other.

CONCLUSIONS: POTENTIAL NEW AGREEMENTS ON GAS TRANSITS THROUGH UKRAINE

The matrix of possible scenarios for the future use of the Ukrainian transit corridor is multidimensional; several uncertainties can be identified:

- export volumes;
- level of conflict with the leadership of Ukraine Naftogaz of Ukraine;
- success in the construction of diversification pipelines;
- EU participation / non-participation in managing the GTS and UGS facilities;
- possible delivery of some of the exported gas on the eastern borders of Ukraine;
- availability / absence of a direct gas supply contract between Gazprom and Naftogaz of Ukraine.

As a borderline scenario, we can name a «soft» scenario (agreements have been reached, gas demand in Europe is high, Gazprom exports additional volumes in the winter period. As a result: the Ukrainian GTS is loaded). The «hard» scenario would involve maximum rejection of Ukrainian transit, limited gas demand in Europe and the Ukrainian direction used only for volumes that cannot be delivered via other routes).

Nevertheless, in either case, we will observe at least three «jumps» in the reduction of transit volumes via Ukraine:

- 2020 - reduction in flows along the southern corridor following the launch of the Turkish Stream;
- 2021 - reduction of flows along the western corridor following the completion of the onshore extension of Nord Stream 2;
- 2022 (2023) - a decrease in flows along the western corridor after the launch of the second string of the Turkish Stream.

Due to likely delays in the commissioning of Eugal, we do not expect a multi-fold drop in transit volumes in 2020 at all. A mild reduction in transit volumes will allow Ukraine to prepare for the reconfiguration of its GTS. On the other hand, the impossibility of abandoning transit in 2020 sets some challenges for Gazprom under the mid-term agreements with the Ukrainian side.

2020 will be the most difficult year for the Russian side. The Ukrainian side could use a slight delay in the launch of Nord Stream 2 to bargain for a new long-term contract for large transit volumes.

In any case, necessary (in the long term) transit volumes specified by Ukraine of 40 bcm a year does not look impossible. At the same time at least 20 bcm of transit will be needed in the coming years even after Nord Stream 2 has been brought online. Additional volume growth can

be provided by «peak» winter load, even given some reduction in the loading (utilization) of diversification routes.

At the same time, for Gazprom to benefit from the more expensive transportation of «peak» gas (and this includes not only payment for transit on the Ukrainian route, but also losses from incomplete loading/utilization of diversification routes), these transportation costs have to be offset by higher spot gas prices in the winter period.

European companies could also contribute to the option of preserving the Ukrainian corridor through guarantees, investments and possible participation in the management of Ukraine's GTS.

A separate option is the possibility of moving the point of delivery of gas to the eastern border of Ukraine. In this case, Gazprom reduces the risks. And the participation of European investors in the operation of UGS facilities will optimize the operation of the GTS - and, as a result, reduce the new cost of transit.

Another factor of uncertainty is the possibility of a new contract for direct gas supplies to Ukraine from Russia. The current «reverse» scheme, although it looks irrational, suits everyone. Gazprom reduces the risks of non-payment for gas supplies, Naftogaz of Ukraine receives additional income from the transit of this gas. European importers choose the maximum volumes under their contracts and receive a margin from the resale of this gas to Ukraine.

A return to direct gas supplies could reduce transit volumes by at least 11 bcm per year (in 2017, the volume of gas purchases by Ukraine from Europe totalled 14.1 bcm). This again raises the issue of profitability of sending gas through Ukraine's GTS given a general decline in transit volumes.

Political factors should be considered separately. The Ukrainian presidential elections are scheduled for March 31, 2019. On the other hand, the mandate of the European Commission expires on November 1, 2019 in Europe. All this means that within several months prior to and following these events, two of the three parties in the negotiations will be more concerned about their own internal political agenda. These factors will likely reduce the effectiveness of the negotiation process during 2019.

In the worst case scenario, it is possible to repeat the developments of the winter of 2008-2009. Agreements would be signed at the last moment, although likely without a dramatic interruption in gas deliveries to Europe.

ATTACHMENTS

Attachment 1. The points of delivery/acceptance of gas at the exit from Ukraine's GTS

Gas measuring station	Capacity, bcm per year	Capacity, mcm daily	Actual transit as of 30.10.2018, mcm daily
Uzhgorod (to Slovakia)	98,4	281,90	125,43
Gorlovka (Romania - south)	26,8	81,40	34,78
Beregovo (to Hungary)	13,2	67,77	25,22
Drozdovichi (to Poland)	5,0	14,5	5,99
Tekovo (Romania - south)	4,5	13,7	1,45
Total:	147,9	475,97	192,87

Sources: «Ukrtransgaz», SKOLKOVO Energy Centre

Attachment 2. Gas pipelines map



Sources: ENTSOG, SKOLKOVO Energy Centre

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