



RUSSIAN GAS TRANSIT THROUGH UKRAINE AFTER NORD STREAM 2: SCENARIO ANALYSIS

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Preface

Since 2014 Russian gas transit to EU became a hostage of a conflict between Russia and Ukraine due to the latter's change of policy orientation in favour of European integration. Russia has made a strategic decision to diminish its gas transit through Ukrainian pipelines by designing and commissioning of new gas export pipelines that bypass Ukraine. Nevertheless, Ukraine transit route still keeps its role as the largest single route of delivery of Russian gas to European consumers but its destiny now is questionable after an acting gas transit contract between Ukraine and Russian Gazprom will terminate in the end of 2019.

This paper contributes to the discussion about the future of Russian gas supplies into the European gas market and role of the Ukrainian gas transit corridor that it will have in the observable future. It represents a vision from the Ukrainian side and considers the prospective for Ukraine to become a part of the EU internal gas market with its current gas transportation infrastructure.

The first chapter gives an overview of recent development of the main gas transit routes of Russian pipeline gas to Europe, planned construction of new gas pipelines, possible demand for gas in Europe as well as their impact on European energy security. The findings are important for understanding the current environment for gas import in Europe and possible changes in pipeline gas supply routes, and its implications for Ukrainian gas transit route.

The second chapter describes the main scenarios for Ukrainian gas transit system utilization presenting all conditionalities that will cause the impact on it in the nearest future. This chapter sheds a light on the most realistic scenarios of Ukrainian GTS utilization as it is seen from Ukrainian prospective, and to warn policy makers in the EU of falling into the scenarios that may be too risky and/or hazardous for the European energy security.

The third chapter is about delivering the main issues of the natural gas market reform in Ukraine that undergoes from 2015 and its implications for a new design of the Ukrainian gas transportation system. In the end of this process Ukrainian GTS has to become an integral part of the European gas market laying a claim to be a large gas trading platform (hub) in the CEE region based upon standard EU rules for gas trade and transit. If successful Ukraine has to be supported by the EU in setting a completely new contractual

relationship with Russia as an Eastern part of EU gas market, trading and transiting gas under EU competitive rules.

It is promised that this analysis will benefit the European discussion regarding development of final, coherent position inside the EU related to new Russian gas import pipelines, Ukraine and Russia as two important countries for EU gas supply security and better understanding of ongoing progress and final outcomes of a reform of the Ukrainian gas transit and storage system.

List of acronyms

Bcm – billion cubic meters
Bcm/a – billion cubic meters per annum
CEE – Central and Eastern Europe
EC – the European Commission
EnCS – the Energy Community Secretariat
EU – the European Union
EU MS – European Union Member States
GTS – Gas Transit System
LNG – Liquefied Natural Gas
LPG – Liquefied Petroleum Gas
LTSC – Long-term Term Supply Contract
NERC – the National Commission of State Regulation in the fields of energy and utilities
RU – Russia
SSO – Storage System Operator
Tcm – thousand cubic meters
TSO – Transmission System Operator
UGS – Underground Gas Storage(s)
UKR – Ukraine

Chapter 1

Physical flows of Russian gas to Europe after Nord Stream 2: what will change after 2020?

Europe¹ has five main sources of natural gas: indigenous production (mostly from the Netherlands), Norway, North Africa (Algeria and Libya), Russia and LNG. The total amount of gas consumed amounted to about 548 billion cubic meters (bcm) in 2017 that is the highest level over the last three years (an increase by 76 bcm compared to 2014), but these volumes are still by 37 bcm lower than in 2010. The main growth drivers were Turkey (+7.1 bcm), the Netherlands (+4.4 bcm), Italy (+4.2 bcm), and Germany (+2.9 bcm) which increased gas demand due to temperature factors, continued economic recovery, and increasing gas consumption in the power sector.

Of this amount around 40% was produced domestically and 60% imported.² As it can be seen in Figure 1, Russia is the single largest supplier

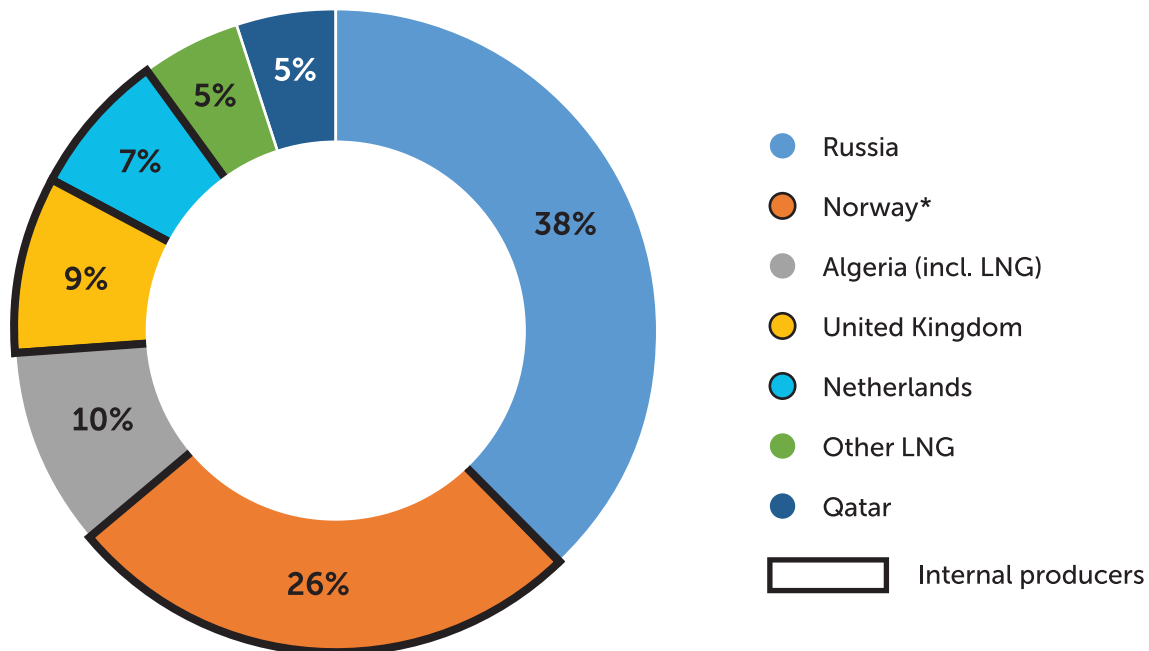
of natural gas to Europe in 2017 with about 40% share. Of the remaining non-domestic supply, 26% came from Norway and other 20% came mainly as LNG from Qatar, Algeria, Nigeria and other countries.

Europe is linked with Russian gas supplies through a number of pipelines that connect gas deposits in Western Siberia, the Yamal Peninsula and Central Asia (the non-Russian sources are firmly contract by Gazprom on a long-term basis) with the end-consumers in European countries.

Currently the following gas transit routes with a total capacity of approximately 280 bcm are used to deliver gas to Gazprom's European customers:

- Ukrainian GTS (Brotherhood pipeline system): has 178.5 bcm of exit capacity, from which 146 bcm can be used to deliver gas to European

Figure 1 Natural gas supply to Europe in 2017, by main suppliers



* Including domestic consumption, pipeline and LNG deliveries from Norway to the European market, except LNG deliveries to Asia and America

Source: Gazprom (2018)

1) This paper follows the methodology of Oxford Institute for Energy Studies that defines 'Europe' as OECD Europe plus Bulgaria plus Croatia plus Lithuania plus Malta plus Romania plus Macedonia minus Serbia (the data on Eurostat for this country is available since 2017 only).

2) Dependency of EU-28 on gas imports is higher and at present consist around 70% according to European Commission.

countries and Turkey.

- Direct pipeline to Finland: 5 bcm
- Nord Stream 1 (direct pipeline to Germany): 55 bcm
- Yamal-Europe (through Belarus and Poland): 33 bcm
- Blue Stream (to Turkey): 16 bcm
- Northern Lights pipeline (to Lithuania and Poland only): 15 bcm

Prior to conducting an assessment of Gazprom's ability to deliver gas to its European buyers without using the Ukrainian transit corridor in 2020, it is useful to understand Gazprom's ability to do this in 2018. Gazprom would require Ukraine

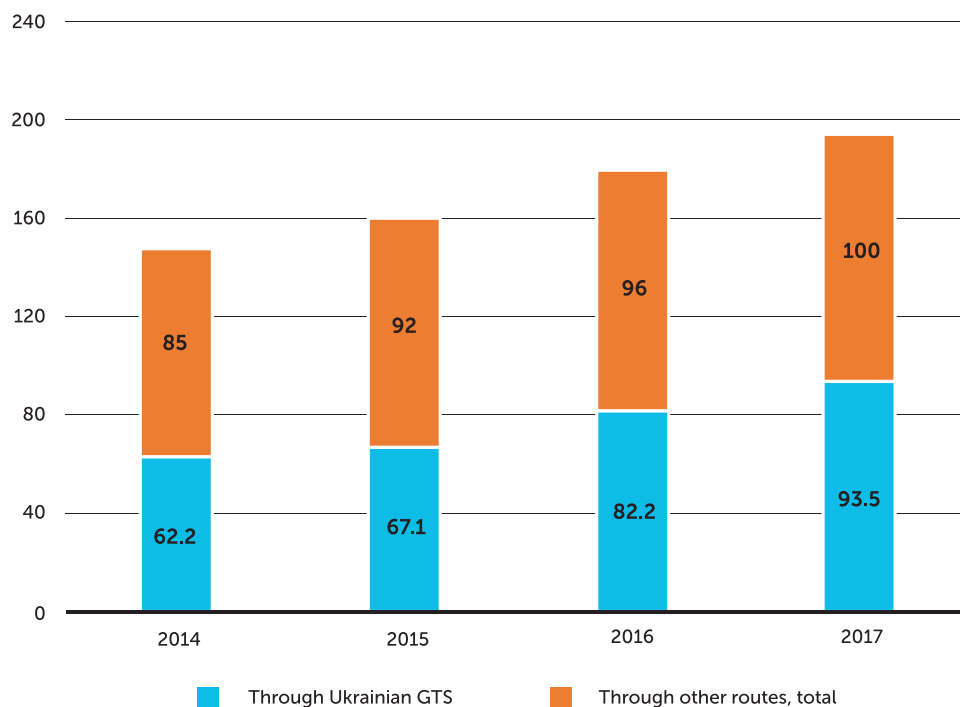
to transit at least 70 bcm for supplying the planned 200 bcm to the EU if no additional pipeline capacities were available.

In terms of physical supplies, Ukraine still plays a key role as a transit route of Russian gas to Europe having supplied almost a half of volumes delivered (94 bcm out of total 194 bcm in 2017). Therefore, Russian gas flows through Ukrainian GTS are securing about 20% of total gas imports to Europe (Figure 2).

Nevertheless, the current landscape of Russian gas flows to Europe may soon undergo significant changes driven by the following main fundamental factors:

First, an acting gas transit contract between

Figure 2 The role of Ukrainian GTS in Russian gas transit, actual supplies in 2014-2017



Source: Ukrtransgaz, Gazprom

Russian Gazprom and Ukraine expires on December 31, 2019 and already became one of conflict issues between the countries after the Stockholm Arbitrage decision according to which Gazprom is obliged to pay gross USD 4.63 bn as a compensation for failing to transit the agreed volumes of natural gas through Ukraine.³ After

the trial Gazprom announced termination of its gas contracts with Ukraine and diminishing of the future gas flows through Ukraine to 10-15 bcm per year only.

Second, Gazprom has a transit routes diversification strategy that implies reducing dependency on Ukrainian transit routes and

3) The net payment in favor of Naftogaz of Ukraine has been ruled by arbitrage as USD 2.56 bn since the arbitration institute previously ordered Naftogaz of Ukraine to pay Gazprom for gas supply arrears of USD 2.02 bn during 2014-15.

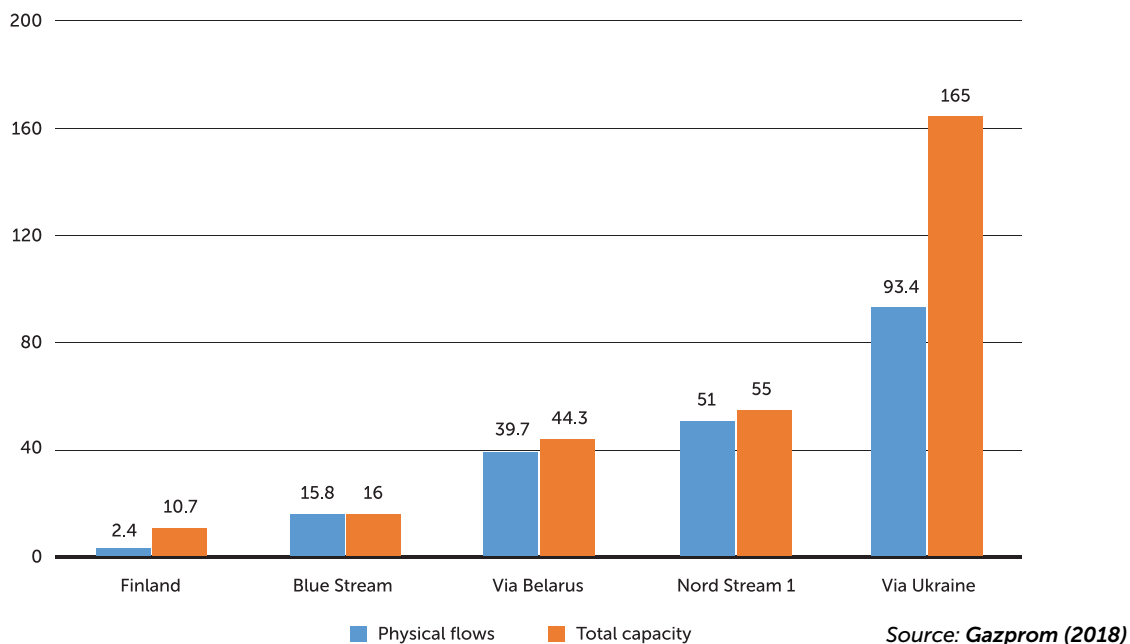
launching new trunk pipelines based on the assumption of sustainable growth of demand on gas imports in Europe until 2035 (Gazprom believes that it will increase in the range of 93-134 bcm in 2035) even given the fact that Ukrainian GTS capacities were only half-utilized in 2017 (Figure 3).

By eliminating the gas transit through Ukraine Gazprom is adding new gas transit capacities in the North and in the South. In the North a new pipeline called Nord Stream 2 will double the existing Nord Stream - 1 pipeline system (additional 55 bcm/a will increase the total project capacity of Nord Stream to 110 bcm/a). Taken together with existing OPAL (capacity of 35.1 bcm/a) and proposed EUGAL pipeline (capacity of 55 bcm/a, from them 45.1 bcm/a towards Czech Republic) plus the expansion of the West-East capacity of the Czech transmission system could

enable the delivery of Russian gas to the Central European Gas Hub at Baumgarten and after to South-East Europe, thus completely avoiding the Ukrainian transit route.

In the South the Turkish Stream Pipeline (also known as TurkStream) will add a potential export capacity of 31.5 bcm/a to South-East Europe for Gazprom. Under this option, the Black Sea route skirts Bulgarian waters and lands in the Northwest Turkey where it connects with the Turkish national system (Botas) and perhaps in the future to other pipelines moving gas into the Southeast Europe via Bulgaria (possibly called “Balkan” or “Bulgarian Stream”)⁴ or Greece towards consumers in the Southern and South-East Europe (at least the capacity of the second thread of TurkStream of 15.75 bcm is designed for this purpose). Being extended through Serbia and Hungary the TurkStream will be also able to deliver Russian gas

Figure 3 Capacity utilization of main supply routes of Russian gas to Europe in 2017, bcm



to Baumgarten gas hub as well.

Third, Russian gas exports will not likely be defined by supply constraints but only by ability of Gazprom’s European consumers to chew up the additional volumes of natural gas and strategy of the European Commission and some of EU MS aimed at diversification of gas supply routes and limit the market power of Gazprom in Europe.

Given the opening-up of the Yamal gas fields and relatively good flexibility of already developed West-Siberian fields, Russian medium and long-term gas exports to Europe could not only be maintained at their current level (194 bcm in 2017) but even increased. Vast gas reserves with competitive production costs⁵ makes Russian supplies a lowest-cost gas source on the European

4) According to reports the Bulgarian authorities the second thread of Turkish Stream should go instead to the Bulgarian shore, where South Stream was planned to land before, prior Southern bypassing route project between Russia and Bulgaria suspended by the European Commission in 2014.

5) The average gas production costs of Gazprom are estimated in a range between USD 25 and 45 per tcm.

market in the nearest future.

Fourth, the commissioning of new pipelines will also depend on politically driven factors that extend far beyond the commercial nature of the proposed new pipelines. The first factor is a legal clause to EU gas market regulations (so-called EU 3rd Energy Package) that aimed at the extension of the EU jurisdiction to off-shore sections of new pipelines which are inbound on the territory of the European Union that practically will mean reducing the market power of Gazprom on the EU internal gas market⁶. The second is the decision of the U.S. to impose sanctions on the companies that take part in the Nord Stream consortia and thus to deprive this undertaking from the access to capital markets as it needs to raise at least a half of required capital to Nord Stream 2 project (USD 9.5 bn worth) as a debt. The sanctions are painful for the European gas companies that participate in the project⁷ and even lead to a geopolitical clash and mutual trade restrictions between the U.S. and the EU.⁸

In general, the situation will depend on the willingness of Brussels to stand for a rigid diversification policy and resist attempts of Russian Gazprom to increase its market power in Europe⁹ or prefer not to intervene. Then new volumes of Russian gas and its supply routes will be designated exclusively by competition forces in the framework of existing vs alternative transit routes, new Russian supplies vs LNG, policies of individual EU MS towards new Russian supplies, among others.

The last but extremely important factor that will influence the future physical flows of Russian gas towards European consumers will be European demand on gas. Since a post-economic crisis decline of 2013-14 the European gas demand started to revive and increased by 15% in average from 480 bcm in 2014 to around 550 bcm in 2017. Gazprom makes its assumptions based on increasing demand for imported gas due to declining European indigenous gas production (and increased demand for imported gas in the EU as a result), EU economic growth recovery and

climate policy that foresees coal-to-gas switching in power generation and wider use of LPG in the transport sector. Nevertheless, the situation with the gas demand in Europe is extremely uncertain. The alternative view on gas demand development (low gas demand scenario) argues that rigid fulfilment of the Paris Climate Agreement (that proscribes to cut the use of fossil fuels in transportation as well as heat and electricity generation to a minimum) by the European Union will lead to gradual phasing-out of gas use by 2050 in Europe.

Under the bottom line, the future demand on gas imports in the EU until 2030 is estimated to be very marginal in the future. Taking 2016 as a baseline, the demand could shrink by about 60 bcm or rise by 100 bcm. There are two important open questions here that will affect future demand:

- (1) Will demand fall faster than indigenous EU production and,
- (2) How growth of gas demand will correlate with existing pipeline capacities for delivering these volumes to Europe?

A moderately growing import demand for gas is however likely to be met by existing pipelines from Russia or LNG imports. Despite the high gas imports in 2017, it would have been possible to provide additional 30-50 bcm through existing pipelines or even more dramatic increase in the demand for gas (though it would be incompatible with the Paris Climate Agreement) would be met through current LNG and pipeline infrastructure.¹⁰ However, with decreasing import demand, the EU runs the risk of Gazprom strategically abusing its excess capacities because even under the growing demand scenario (that imply growth of demand on imported Russian gas from ~200 bcm now to almost 250 bcm in 2030) after possible completion of Nord Stream 2 and TurkStream the excessive pipeline capacities as shown in Figure 4 will appear that will almost likely lead to diminishing the volumes of gas transit through Ukrainian GTS in the long-term.

6) Under proposed changes to the gas directive, all import pipelines would have to comply with EU rules requiring pipelines not be owned directly by gas suppliers, non-discriminatory tariffs, transparent operations and at least 10% of capacity to be made available to third parties.

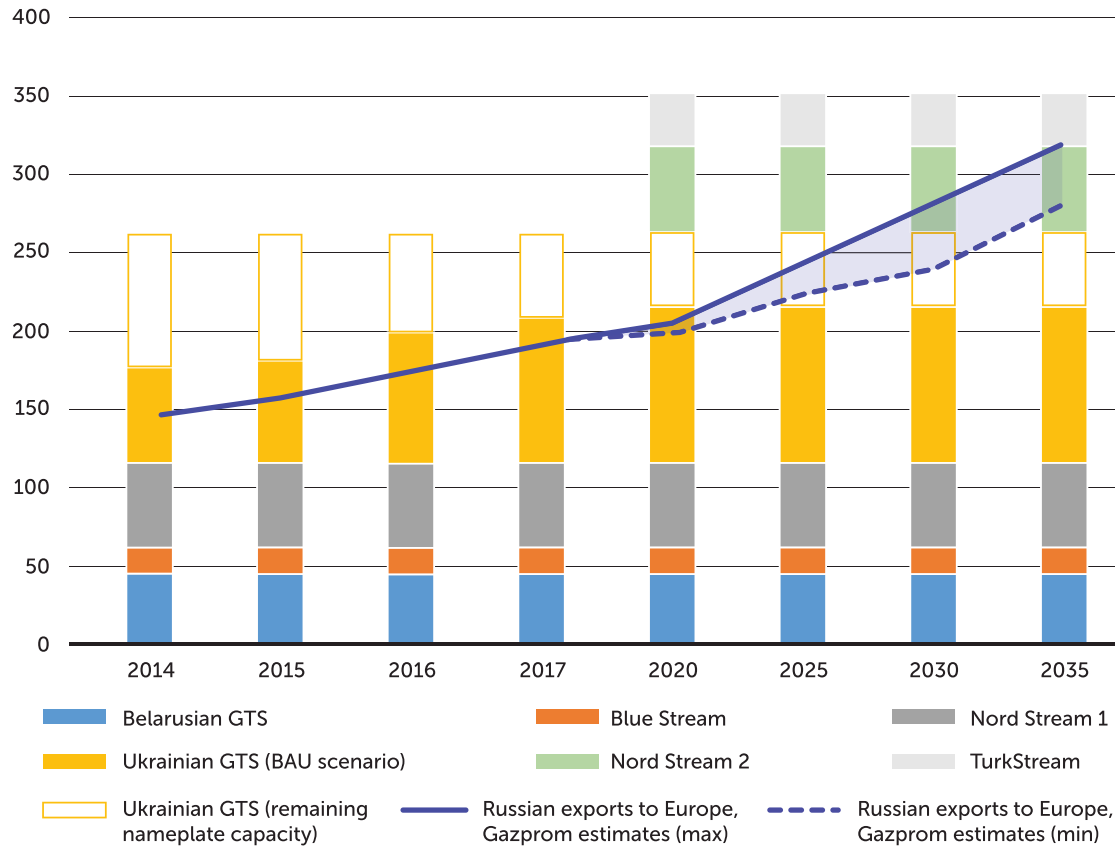
7) Namely, Shell, Uniper, BASF/Wintershall, Engie and OMV.

8) In an attempt to resolve the dispute Germany announced about a plan to build its first LNG terminal from scratch as an attempt to diversify its gas supply away from dependence on Russian and Norwegian pipeline gas.

9) As well as from anti-trust, political and security considerations that are also extremely important for EU external policy and development of competitive EU gas market but are left behind the scope of this paper.

10) Taking into account existing gas storage capacities that allow to store around 30% of Europe annual consumption (including Ukrainian UGS) and low utilization of existing LNG capacities (that can provide for 43% of EU annual consumption but were utilized by 27% only in 2017), and assuming that inner-European infrastructure is being sufficiently developed, even a demand hike of 30% could be met.

Figure 4 The existing and planned capacities of Russian gas exports to Europe under different scenarios of Russian gas exports to Europe*, bcm/a



*Assuming that Europe import gas demand are by 100% covered by Russian pipeline supplies as the most optimistic case for Gazprom. BAU (business-as-usual) scenario for the Ukrainian GTS implies that Russian gas transit will constitute 110 bcm in long-term.

Source: Own calculations based on Henderson & Sharples (2018) and Gazprom (2018)

Summarizing, the future landscape of Russian gas exports to Europe will be defined by a mix of market and policy regulations forces that set the framework for combination of main Russian gas transit routes and its capacity utilization after 2020. To final extent, an appearance of two new Russian gas import pipelines towards Europe will to very much extent depend on future natural gas demand developments in the EU. Marketing strategy of Gazprom as well as possible policy intervention by the European Commission regarding development of truly competitive EU internal gas market, extending the competitive rulings on external gas pipelines that delivers imported gas to the EU will also have tremendous impact on its development.

In that regard, it is advisable to the EU to consider the Nord Stream 2 project from EU energy security and external policy prospective and at current stage of its development to postpone its commissioning until the energy market regulations, plans for development of necessary internal EU infrastructure for free flows of gas inside the Union and projections about future EU demand for gas will be updated and clarified. Otherwise, the projects of new Russian gas import pipelines will bring the serious risks of increasing Gazprom dominance at selected EU gas markets, abusive use of excessive pipelines capacities and strengthening the Russia's leverage on EU external policy in Europe.

Chapter 2

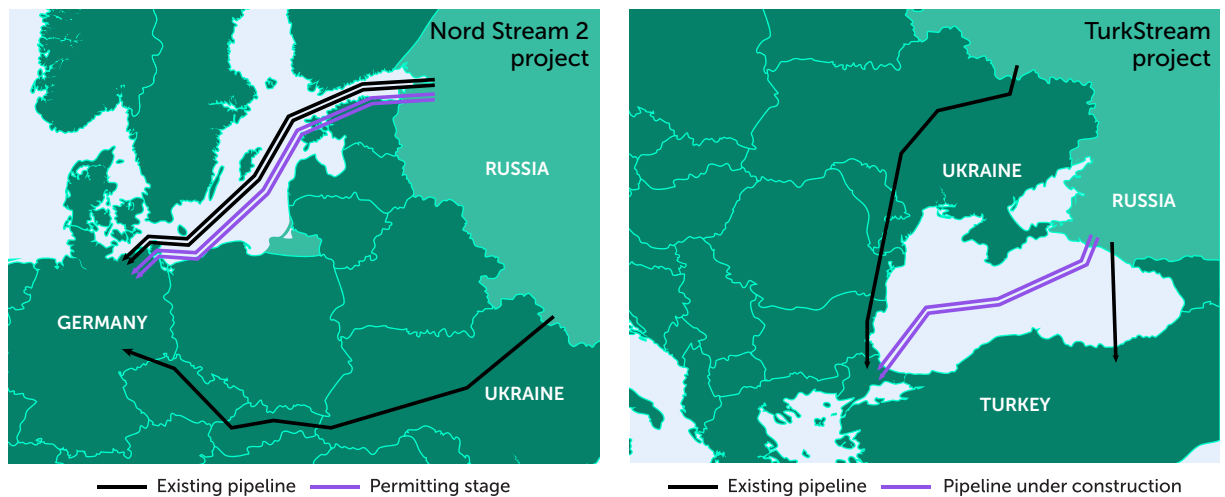
Utilization of Ukrainian GTS after 2019: realistic assumptions

The scenarios in this chapter depict the possible impact that new Russian pipelines (if commissioned) will have on current “business-as-usual” utilization of the Ukrainian GTS preceding the full implementation of the 3rd Energy Package in Ukraine that is currently ongoing. Application of EU Gas Directive to use the Ukrainian gas transportation system after Naftogaz unbundling as well as its possible extension to all major offshore import pipelines entering EU territory like Nord Stream 2 and TurkStream will enable competition between “old” Ukrainian and “new” bypassing routes of Russian gas supplies in Europe. In this case the volume of gas transit via the Ukrainian GTS will be driven by major EU gas consumers of Gazprom that will choose the delivery route based on economic parameters. This option is mutually beneficial for the EU and Ukraine but requires amendments to the EU Gas Directive and renegotiation of a model gas transit contract between Ukraine and Russia involving the EU as an intermediary. Parameters and possible outcomes of such changes should be the subject of another research.

As it was identified in the previous chapter currently there are two main transit routes that Russian gas follows on its way to European consumers: (i) Ukrainian GTS, and (ii) Nord Stream 1. In addition, Gazprom builds two alternative pipelines – Nord Stream 2 (that is simple doubling of existing capacity of NS1) and TurkStream (a new route for serving the target markets of Turkey and Southern Europe) – which are planned to be completely commissioned in

the end of 2019. Completion of two alternative transit routes of Russian gas to Europe, assuming that demand on imported Russian gas will grow moderately in long-term, would create a possibility for Gazprom (and Russia as a country) to use excessive pipeline capacities to ad hoc decide on the entry point for its gas supplies. This might allow Gazprom to maximize its market power in certain parts of the European gas market (influencing gas prices) and/or obtaining political

Figure 5 Nord Stream 2 and Turkish Stream projects



Source: Gazprom (2018)

concessions in exchange for security of gas supply (volumes/prices).

The current overview of the progress in these two bypassing pipelines and the possible scenarios shows that Ukrainian GTS will still keep its importance for supplying Europe with Russian gas even if Nord Stream – 2 and TurkStream will be commissioned in time, no later than in 2020.

Regarding Nord Stream – 2, its target to become fully operational in January 2020 (as it was recently stated by Gazprom’s CEO Alexey Miller) will unlikely to be met in time. Even when the

new pipeline will be rerouted evading Danish territorial waters (avoiding the need to receive the last permission from EU Member States on construction of a pipeline on their parts of exclusive economic zones) it still may be hit by (1) the EC decision to extend the jurisdiction of the 3rd Energy Package on offshore pipelines that enter the EU; and/or (2) the U.S. sanctions against companies from Nord Stream consortia involved in the pipeline construction that may cause painful shortage of debt funding required for its completion.¹¹

11) A bill passed by Congress in 2017 constitutes the legal basis to enact such sanctions, and their launch will depend on the political momentum.

Table 1 Possible scenarios of alternative utilization of Ukrainian GTS depending on bypassing pipelines commissioning and projected EU gas demand, Ukrainian perspective

Scenario	Pipelines configuration	No	Transit through Ukraine options	Ukrainian GTS utilization, bcm
Risk (EU low demand)	NS2 and Turkish Stream are commissioned after 01.01.2020, UKR GTS – 100% reverse/domestic system	1	“Zero” transit	0-10
		2	“Peak demand” transit	10-20
	NS2 and Turkish Stream are commissioned after 01.01.2020, UKR GTS – except reverse/ domestic gas transit some part of “political gas”	3	“Political arrangements” transit	~30
Baseline (EU low demand)	TurkStream is ceased, NS2 is commissioned, UKR GTS – lost some transit but can payback itself	4	“Minimal breakeven” transit from 2021	40-60
Baseline (EU low demand)	TurkStream is ceased, NS2 is commissioned, UKR GTS – receives some “politically guaranteed” transit volumes	5	“Minimal breakeven + political arrangements” transit from 2021	70-90
Optimistic (EU low demand)	NS2 and other bypassing pipelines are ceased, UKR GTS – used as usual, transit volumes are market driven, UKR and RU has a new agreement	6	“Business-as-usual 2017” transit	90-100
Optimistic (EU high demand)	NS2 and Turkish Stream are commissioned in 2021-22, UKR GTS is used to deliver “excessive” RUS gas imports to Europe	7	“Excessive volumes congestion” transit	up to 100

Source: own analysis

TurkStream is currently under construction, and the first line, which will transport Russian gas to the Western Turkey, is due to be completed by the end of 2019. The second line, to carry Russian gas to Turkey for further transport to the South-Eastern Europe, that will have a direct impact on transit via Ukrainian GTS;¹² could also be completed in a comparable time frame, but due to unresolved regulatory issues, it is not clear which of several alternatives (a proposed pipeline from Greece to Italy, expansion of the Trans Adriatic Pipeline to

take Russian gas, Bulgaria-Turkey interconnector or new Balkan Stream pipeline in Bulgaria) will be used for further gas transportation to European destinations.

As projected by the Oxford Institute for Energy Studies, it seems that in early 2020 the new Gazprom pipelines will be unlikely commissioned and put into operation. In this case, even having a capacity on OPAL joint pipeline lifted (that has already happened in 2018 and allow Gazprom to use Nord Stream 1 at full capacity);¹³ without

12) To contrary, the 1st line of TurkStream gas volumes (16.5 bcm/a) as expected would be completely absorbed by growing Turkish market.

13) However, this decision is currently being implemented on a provisional basis pending a final European Court of Justice (ECJ) ruling, which is expected in 2019.

Ukrainian transit Gazprom would be able to serve the Czech Republic, Slovakia, Austria and Hungary at 2017 export levels and above, but be unable to meet a significant part of Italian demand, and be unable to make deliveries to south eastern European countries and Turkey that will require the use of Ukrainian GTS under “business-as-usual” scenario.

On the contrary, by the mid-2020 or just shortly after two strings of TurkStream and two strings of Nord Stream 2 may be likely commissioned and first amount of gas will flow to Europe depriving Ukrainian GTS of some volumes of transit gas. Assuming the current level of Russian gas exports to Europe (190 bcm/a), in this case Gazprom would be able to serve all its European markets, and Turkey, without using Ukrainian transit pipeline apart of transiting some “residual/peak demand” amount of gas equal to 10-20 bcm/a for covering the winter peaks of gas demand in Europe.

But in the meantime, an amount of this “residual” transit may be the subject of political arrangements involving the EU level (EC), Russia and Ukraine regarding politically motivated retaining of some transit volumes via Ukraine in exchange for EU guarantees not to block Nord Stream 2 project through legal levers of 3rd Energy Package. EC Vice-President Maroš Šefčovič (responsible for Energy Union project) is quite optimistic to steer a trilateral negotiations process after Gazprom announced about reduction of transit volumes via Ukraine after 2019 when current transit contract will terminate as a reaction on the Stockholm arbitration decision that was not in favor of Gazprom. The optimism of the EC is backed by previous successful experience of negotiating the so-called “winter packages” in 2015-17 that ensured continued transit despite the Russian-Ukrainian dispute over the current transit contract. Possible outcomes of such negotiations are highly uneven, it is only expected that Ukraine will strive for preserving at least current volumes of transit (80-90 bcm/a), Gazprom will tend to minimize the guaranteed volumes to around 30 bcm/a or to make it conditional to demand fluctuations. The EU will put pressure on both sides to find a happy medium in order to ensure Ukrainian GTS operations at least as a back-up transit system during winter months (especially, taking into account its large UGS) and until other new pipelines utilization will reach its full project capacities, but for this such arrangements must guarantee at least reaching conditional “minimum” of transit for the Ukrainian system (estimated near 40-60 bcm/a) for not being scrapped at all.

Baseline scenarios assume that at least one of the

alternative pipelines of Gazprom would be ceased for a some reason (legal, market, geopolitical or other). Ukrainian GTS will be deprived of some volumes of Russian gas transit but residual volumes are likely to be sufficient to keep unstoppable work of Ukrainian pipeline at least at the breakeven level that was estimated between 40 and 60 bcm. This “breakeven” scenario may be supplemented by political guarantees giving as a result a range of transit between 70 and 90 bcm/a.

Another option would emerge under the assumption that demand on gas imports in Europe will demonstrate the firm tendency to exceed the current (2017) level. In this case, even having two new Gazprom pipelines built, Ukrainian GTS could be used to congest the “excessive” volumes of Russian gas exports sent to Europe that may constitute at least 70 bcm/a in a moderate case.

Under any scenario it should be recognized that Russian gas transit development after 2019 would have two phases: (a) intermediate: from the end of 2019 to 2021 when the destiny of bypassing pipelines will be ultimately clarified; (b) long-term: after 2021 and until 2030 when the demand on imported gas will be ultimately clarified. In any case the future use of Ukrainian GTS to large extent will be dependent on political decisions at EU level regarding the model of the Europe’s gas supply security that may affect both new Gazprom pipelines and Ukrainian GTS.

It should be noted that scenarios 1 and 2 as well as scenario 7 are quite unlikely as they inflict heavy conflict between Russia and Ukraine regarding the agreement over future Russian gas supplies through Ukraine after beginning of 2020 in cases 1 and 2. It will mean utilization of Ukrainian GTS only for delivering of reverse gas from the EU back to Ukraine and transportation of domestically extracted gas, while scenario 7 implies steep increase of EU demand on imported pipeline gas in long-term that is currently highly unpredictable.

The scenarios 3 and 5 that assume reaching some “political arrangements” between EU, Ukraine and Russia, and certain guarantees taken by Gazprom to pump a certain amount gas via Ukraine also imply high level of uncertainty as neither their duration nor contractual framework are currently known. Such arrangements are linked to approaching political cycles in the negotiation parties (esp. upcoming elections in Ukraine and the EU in 2019), have no firm guarantees to be fulfilled in long-term, and leave the space for Gazprom to qualify them in the first years (when the residual need to use Ukrainian GTS will exist objectively) and gradually avoid them after 2021 after its new export pipelines will be loaded to the full projected capacity.

Chapter 3

Gas transit after Naftogaz unbundling: a new business model for gas transmission and storage in Ukraine

Discussion about new Gazprom export pipelines bypassing Ukraine and future utilization of Ukrainian GTS would be incomplete without projections on how the Ukrainian gas transportation system will be embedded (as an integral part) into the EU internal gas market, as well as how the interests of its users will be treated under a new business model of Ukrainian transit system.

Gas market reform in Ukraine started in 2015 after adoption of the framework Law “On the Natural Gas Market” among other strategic choices towards aligning the national regulation with EU rules also brought the implementation of European competition rules in the gas sector. According to them, the business of gas transmission should be separated (unbundled) from other types of activities related to gas business (i.e., exploration and production, wholesale and retail trade etc.).

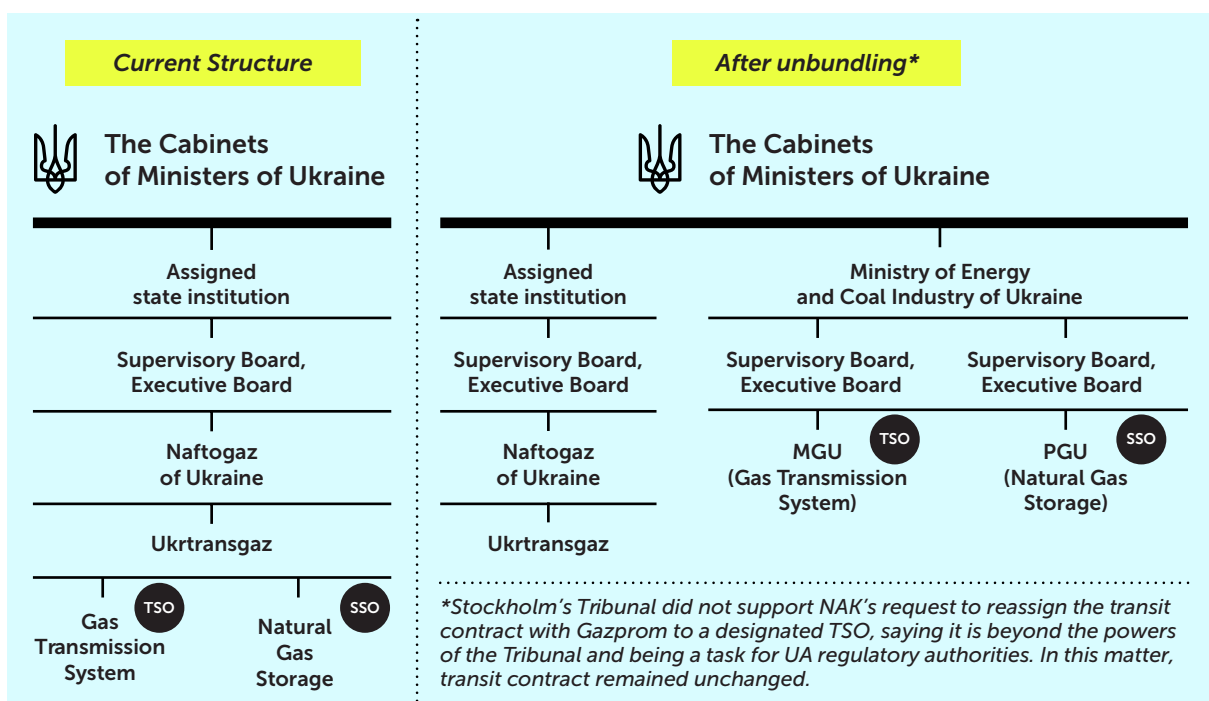
Furthermore, during the last years Ukraine

undertook drastic efforts to get rid of direct gas imports from Russia and completely switched to natural gas imports from European countries; moreover, it has reduced general imports by 50% between 2013-2017 – from 28 to 14 bcm. The segment of wholesale gas imports has been opened for competition (67 importers appeared at EU-UKR borders in 2017) and leading European companies have already launched their operations in Ukraine.

Currently, gas transit business in Ukraine is a natural monopoly owned by NJSC “Naftogaz of Ukraine” subsidiary – JSC “Ukrtransgaz” – that manages all trunk high pressure pipelines and all major gas storage facilities, and controls 100% of the gas transit market.

On 1 July 2016, the Government of Ukraine approved a plan¹⁴ in line with the regulations of the Law of Ukraine “On the Natural Gas Market” setting out the corporate restructuring of Naftogaz. The plan is the result of cooperation between

Figure 6 A possible model of Naftogaz unbundling according to 2016 Governmental plan



Source: Naftogaz, the Cabinet of Ministers of Ukraine, own representation

14) CMU Resolution #496 dated 01 July 2016.

Ukraine's Government and the Energy Community, ensuring that the unbundling process is fully compliant with the Energy Community's regulatory requirements and the EU's 3rd Energy Package. Accounting and functional unbundling is already a reality, and ownership unbundling is the final step towards full compliance with the energy community and EU regulations. The Government's unbundling plan requires that Ukraine's TSO (Ukrtransgaz) is legally and functionally independent of natural gas production and supply operations performed by its parent Naftogaz and any other subsidiary.

During the unbundling process, ownership unbundling will be performed to separate the GTS and the UGS from Naftogaz and transfer their ownership to the state, under the management of the Ministry of Energy and Coal Industry of Ukraine, creating two new public JSCs, "Main Gas Pipelines of Ukraine" (MGU) and "Underground Gas Storage Facilities of Ukraine" (PGU). Naftogaz and its production and supply units will remain under the Ministry of Economy and Ukrtransgaz is likely to be restructured with a possibility to sell a part of the new undertaking to a strategic Western investor.¹⁵

Effective unbundling will be a crucial factor for survival of the gas transit system in Ukraine and its competitiveness among gas European gas companies. The final goal of unbundling should be to make Ukrainian GTS a reliable and profitable business even after Ukraine will be completely bypassed by the alternative Russian routes. Unbundling must end with separation of GTS/UGS activities into a separate independent, transparent and effective business that would offer to European gas traders and end-consumers attractive conditions for buying and delivering of import gas (mainly of Russian origin) to contract destinations under management of a strong transmission system operator (TSO)¹⁶ which will guarantee fair treatment to all GTS/UGS clients in terms of access to pipelines, transparent and predictable tariffs etc., based on regulations and standards fully aligned with acting EU rules.

Establishment of a new TSO shall be complemented with engagement of a reputable international GTS partner in order to ensure transit volumes after 2019 and attract investments/

experience for further development of GTS. This would be possible only when TSO unbundling process will be finalized in strict accordance with EU and Ukrainian regulatory requirements taking into account the recent results of Stockholm arbitration between Naftogaz and Gazprom which should grant the necessary level of credibility in the eyes of Western gas companies. A new TSO is planned to be established and certified by national energy regulator (NERC) and the EnCS no later than the end of 2019 according to recently adopted the [TSO Unbundling Roadmap for 2018-2020](#).

After establishment of a new TSO the number of its inner problems should be also resolved, like origin of debts and legacy issues, redefining the scope of services and pool of clients on the market, optimization of TSO operations and business processes¹⁷, establishment of a program of GTS upgrading and modernization. An additional problem for a new TSO is inheritance of a current gas transit contract as Gazprom refused a proposal to transfer all rights and responsibilities it foresees from "Ukrtransgaz" to a new company.

But for being considered completed, the gas transit reform apart of purely TSO separation issues, the market rules for use of gas transmission infrastructure and storage should be finally transposed and implemented in line with related EU energy regulations and standards. Namely, the necessary secondary legislation for GTS/UGS operations in competitive environment should be adopted, daily market balancing rules and procedures have to be introduced (as well as respective IT decisions for TSO and market players), and opening all market segments for competition and ensuring transparent and non-discriminatory third-party access (TPA) to all gas transportation infrastructure. Simultaneously, overall gas market reform in Ukraine and related changes to gas transit business should pursue a goal to integrate existing Ukrainian gas transmission infrastructure into EU internal gas market as the country has all necessary infrastructure, framework regulations and geographical positioning to become one of the gas trading hubs on the eastern borders of Europe.

For example, Ukraine's UGS capacity can be used by foreign traders, including residents of the countries which lack storage capacities

15) The respective changes into national legislation were made in August 2014 allowing to sell so-called "management stake" of 49% of a new TSO to a foreign investor or consortium of the companies.

16) TSO legal model became a subject of political rivalry in Ukraine between Naftogaz and the Cabinet of Ministers but now main conflict points are resolved.

17) Now UTG performs untypically wide range of functions, above and beyond what can be found in many other European TSOs, like lots of service, construction and engineering functions, and other business activities that in EU countries are usually outsourced.

TPA requirements for transit through Ukrainian GTS

In addition to the 2016 Law of Ukraine “On the Natural Gas Market”, access of third parties to the natural gas transit system is regulated by the Gas Transmission Network Code.

To use the natural gas transit system, similarly to the requirements valid for third parties who want to access transmission and storage facilities, third parties are required to have a signed Standardized Natural Gas Transportation Agreement and have applied for capacity allocation on a yearly, monthly or daily basis. Additionally, they are required to provide a financial performance guarantee for 20% of the potential cost of balancing gas.

Transit is open to all potential clients for the entry points Budince, Hermanovychy, Beregdaroc and the exit point Budince based on the signed agreement between UTG and the Polish TSO (Gas System S.A.), the Slovak TSO (Eustream) and the Hungarian TSO (FGSZ ltd). Other entry and exit points on cross-border pipelines are used for the existing transit agreement between Gazprom and Naftogaz until the expiry of this transit agreement on 1 January 2020.

UTG allocates free capacities at the entry and exit points according to the following three categories:

- Guaranteed capacity (the operator guarantees a pre-defined capacity for a pre-defined period set out in a Capacity Allocation Agreement);
- Intermittent capacity (the operator may allocate, but does not guarantee, a pre-defined capacity for a pre-defined period);
- Reverse capacity (flows transited through Ukraine and subsequently reimported from neighbouring countries).

TPA to physical interstate entry/exit point capacity is only permitted if:

- Capacity provided on a yearly basis does not exceed 90% of the entry/exit point’s technical capacity;
- At least 10% of technical capacity is available at any point for quarterly periods during a gas year;
- Any unsold balances that were not sold for yearly and quarterly periods are available for monthly periods at least one day in advance.

Application materials, deadlines and fees are published on the TSO’s (JSC Ukrtransgaz) official website.

Source: KPMG (2017)

(e.g. Romania, Slovakia, Hungary, Poland) to mitigate seasonal fluctuations of gas demand in the CEE region and guarantee the security of gas supply in case of emergencies. For this Ukraine has already introduced all legal and operational conditions for the functioning of customs regime “customs warehouse” on the basis of 10 gas storage facilities (Chervonopartyzanske, Solokhivske, Bogorodchanske, Bilche-Volytsko-Uherske, Uherske, Dashavske, Oparske, Kehychivske, Proletarske, Krasnopopivske). The specified customs regime allows customers to store natural gas in underground gas storage facilities of Ukraine in the customs regime - “customs warehouse” within 1095 days without paying taxes and customs duties.

Being a part of the EU internal gas market with a properly acting gas trading platform, Ukraine has to receive support from the EU side at political

level regarding the changing rules of the game with Russian Gazprom that own an export monopoly to sell Russian natural gas to Europe. Given the recent (May 2018) EU anti-trust decision against Gazprom, its clients in the EU received a certain level of flexibility regarding defining the virtual swapping of gas volumes with neighbors and disputing the LTCS prices set by Gazprom to align it with current prices on the spot market. We assume that similar provisions should be granted to Ukraine as a background of setting the future contractual relationships with Gazprom after 2020. Moreover, while disputing the destiny of NordStream – 2 and European part of TurkStream with Russia, the EU may raise a question of granting the access to export pipelines to other gas producers in Russia (i.e., Novatek and others) and their use of Ukrainian GTS under standardized EU rules.

Conclusions and policy recommendations

1. Under certain conditions Nord Stream 2 will bring serious threats to EU energy security, hence, the best option for the EU will be to postpone this project until the demand projections, regulations and geopolitical disputes will be ultimately clarified

Nord Stream 2 could benefit Russia in two ways. First, Russia can gain a larger share of the total surplus by minimizing the costs incurred by transiting gas through Ukraine which levies transit charges. Second, Russia can pursue a strategy of price discrimination by exporting gas to EU Member State at different costs and, therefore, maximizing overall profits. This would increase the producer surplus at the cost of a smaller consumer surplus.

In contrast to that, LNG imports are a relevant asset on sides of the EU to not only cover peaks in demand but also to maintain competition in the gas sector. This only holds true as long as capacities remain flexible to better respond to changes in supply and demand. Long-term contracts and capacities that are fully used are therefore of little value.

Additional Russian pipelines are only in the EU's interest when it is expected that a demand increase cannot be met by existing pipelines but only through greater LNG imports, which would deprive the EU of its flexibility and resilience in the gas sector. Whether such a demand increase will materialize cannot be said at this moment.

Recommendation: It is advisable that the EU would find a way to postpone the construction of Nord Stream 2 until it becomes clear how the demand for gas will develop in the future as well as regulatory framework for off-shore import pipelines. Only if a long-lasting and sustainable shortage is safely predicted, which cannot be covered by existing pipelines or flexible LPG imports, shall Nord Stream 2 be built to avoid excessive costs of importing LPG and compromise competitive forces in the sector. If the demand is forecasted to not increase rapidly, the EU can gladly forgo the disadvantages Nord Stream 2 would bring about by stopping its construction.

2. There are different scenarios for further use of Ukrainian GTS but the less risky ones should be discussed and compromised to secure reliable import of Russian gas to Europe

Scenario analysis shows that there are at least 7 different scenarios depending on probability of new bypassing Ukrainian GTS pipelines commissioning, political arrangements and future demand on Russian gas in Europe. The most daunting scenarios must be avoided at any price because they are not only harmful for Ukraine and other CEE gas transiters (Slovakia, Poland etc.) but also for gas supply security of the European internal gas market and political integrity of the EU itself. The best case scenarios are highly preferable for all sides of Russian gas transit to Europe but they can be barely reached due to uncertainty in future European demand on gas imports and imbalance between the interests of sub-national EU authorities and individual EU MS that leave low changes to entirely block both of new Russian gas transit projects.

Realistically, the parties should prepare themselves for the emergence of some “somewhere in between” options, like the case when Nord Stream 2 will be commissioned and allowed to pump the gas towards European consumers and the 2nd string of TurkStream will not be built due to market or legal impediments and completion and launch of Nord Stream 2 will be the subject of certain political arrangements in a triangle EU-Russia-Ukraine that provide some “out-of-the-market” guarantees from Gazprom side to retain some amount of transit via Ukrainian GTS. Under such scenarios an intermediate solution may be found: for example, approving Nord Stream 2, while assuring that Ukraine would continue to play a transit role (albeit reduced) even after Nord Stream 2 is built.

Recommendation: Given the situation when new Russian pipelines will not be likely commissioned in time as scheduled (at the beginning of 2020) an option for negotiations and reaching further deal for Russian gas transit post-2019 should be developed under two possible timeframes: (1) signing a renewed version of gas transit contract between Russia and Ukraine for the

next 3-5 years that will include new principle of transit tariff definition under the standard EU rules and possibly the result of political arrangements, or (2) use a mechanism of 'one-time annual deals' similar to 'winter packages' for Russian gas supply to Ukraine in 2014-15 that is to applied in the case a framework decision regarding the use of Ukrainian GTS will not be found shortly after acting transit contract will terminate in 2019.

3. Effective completion of unbundling of vertical integrated monopoly NSJC “Naftogaz” and separation of GTS and UGS into separate competitive businesses will be the crucial prerequisites for survival of gas transit business in Ukraine and its integration into the EU internal gas market

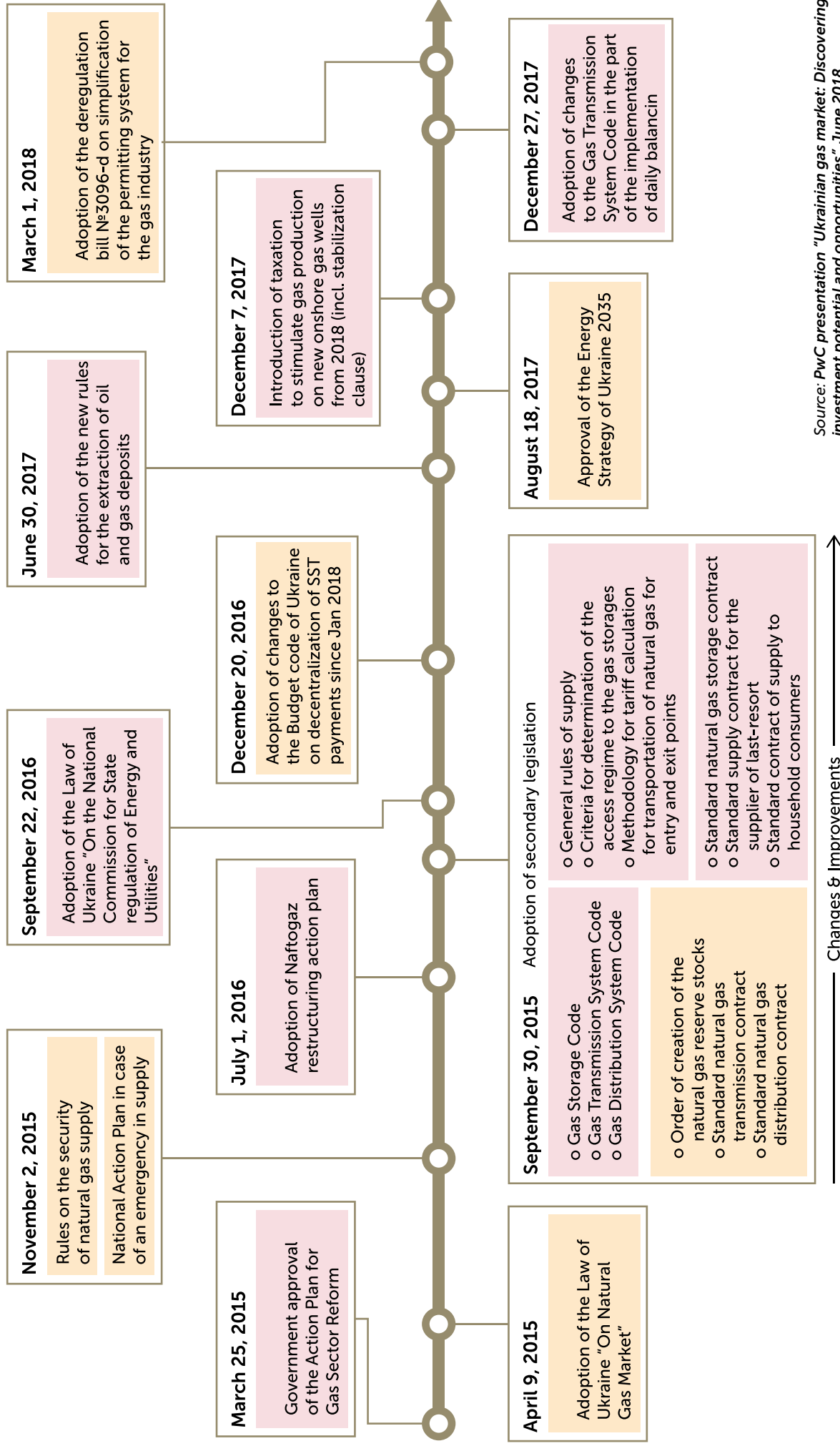
Regardless the chosen ultimate option for UGS/UGV unbundling it must end with the establishment of a truly independent, transparent and efficient TSO, and implementation of a modern natural gas regulation compliant with European standards that will serve to a goal of setting the strategic partnership with international investors and making the gas transit system competitive and profitable even being bypassed by alternative routes of Russian gas delivery to Europe.

Recommendation: Strategically, Ukraine has to finalize the process of Naftogaz unbundling, separation of GTS/UGS facilities into separate business and look for an international partner to manage its GTS, bring technological know-how and secure transit flows after 2019. Capacity of Ukrainian underground gas storage facilities are the largest in Europe, equals to nearly a third of EU-28 capacity and are currently being underutilized. Taking into account the available infrastructure, Ukraine could be a natural candidate for an Eastern European Gas Hub and supported by the EU at political level to set up a new, based on EU rules, infrastructure for the gas trading with Russia under common EU rules.

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Annex 1 Gas market reform in Ukraine: key steps with indication of adopted regulations



Source: PwC presentation "Ukrainian gas market: Discovering investment potential and opportunities", June 2018

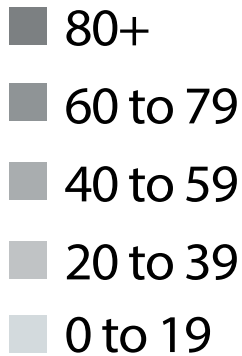
Annex 2 Characteristics of Ukraine's GTS and UGS facilities

Parameter	Units	Value
<i>Total length of gas pipelines</i>	<i>ths km</i>	38
<i>Capacity:</i>		
<i>- Entry</i>	<i>bcm per year</i>	304
<i>(incl. from Europe)</i>	<i>bcm per year</i>	23
<i>- Exit</i>	<i>bcm per year</i>	178.5
<i>incl. to Europe and Turkey direction</i>	<i>bcm per year</i>	146
<i>Gas compressing stations</i>	<i>number</i>	73
<i>Gas compressing yards</i>	<i>number</i>	111
<i>Gas compressing units</i>	<i>number</i>	705
<i>Capacity of compressing stations</i>	<i>MW</i>	5496
<i>Underground gas storages</i>	<i>number</i>	12
<i>Capacity of underground gas storages</i>	<i>bcm</i>	31
<i>Gas distribution stations</i>	<i>number</i>	1475
<i>UTG headcount</i>	<i>ths employees</i>	20

Source: Naftogaz, Ukrtransgaz

TRANSIT OF RUSSIAN GAS TO EUROPE

Gas imports 2017 (%)



Traditional route via Ukraine

Nord Stream

Nord Stream 2

Yamal – Europe

OPAL

EUGAL

Turkish Stream

Blue Stream



Source: Naftogaz report "Why the seven arguments used to justify Nord Stream II are wrong"



Russia

Finland

55 Nord Stream
bcm

Norway

Sweden

55 Nord Stream 2
bcm

Estonia

Latvia

Lithuania

146 Traditional route
bcm via Ukraine

39 Yamal – Europe
bcm

Belarus

36 OPAL
bcm

55 EUGAL
bcm

Poland

Ukraine

Germany

Czech Republic

Slovakia

Moldova

Austria

Hungary

Romania

32 Turkish Stream
bcm

Italy

Serbia

Bulgaria

16 Blue Stream
bcm

Turkey

Greece

