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Russian Strategy on Infrastructure and Gas Flows to Europe

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5.2. Russian Strategy on Infrastructure and Gas Flows to Europe

Manfred Hafner

1. Introduction

The major Russian strategic goals in the sphere of energy export is to guarantee security of energy flows to solvent customers in order to assure the needed cash flows to the Russian economy, but due to the importance of energy in the region's economies, politics and economics become often intertwined.

In order to reach its above mentioned strategic goals, Russia aims at:

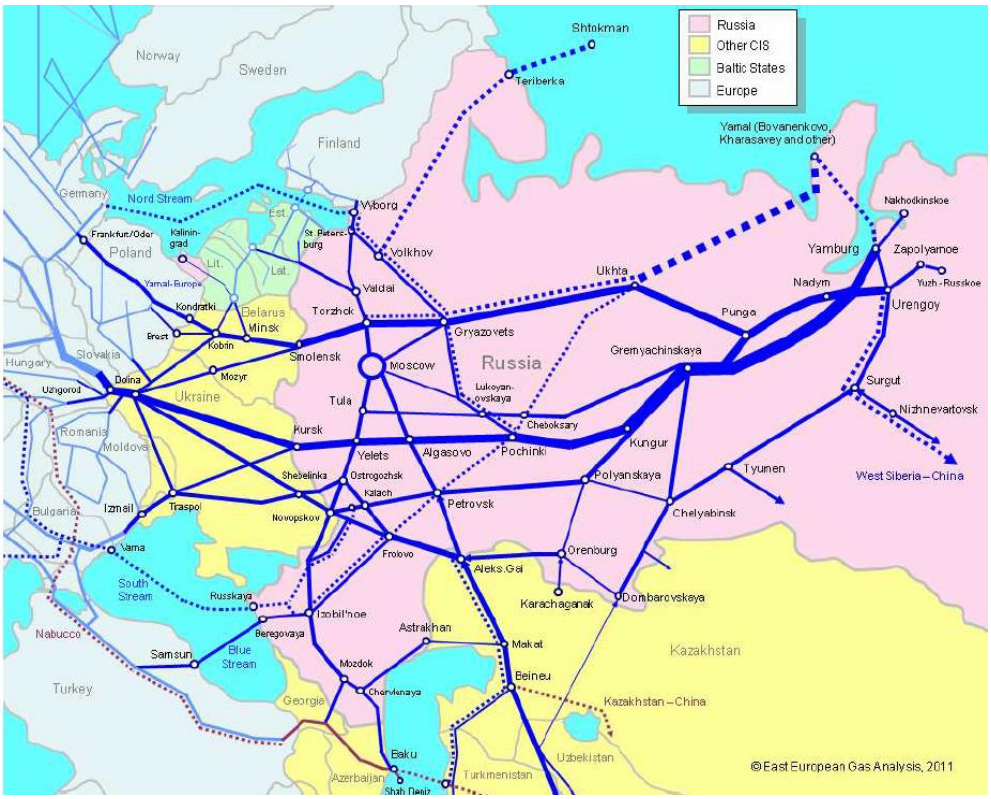
- getting operational control over transit routes, or
- diversifying export infrastructure (not just for gas, but also for oil), and
- minimizing the role of transit countries

National control over the gas transportation assets became an essential part of sovereignty development in the new CIS (Commonwealth of Independent States) countries. Control over the Gas Transmission System (GTS) was regarded as a part of national identity and a symbol of independence from Russia. Having understood that there is no way to get control over these assets, Russia decided to develop new pipeline routes thus by-passing transit countries.

2. Existing Russian gas export routes

Figure 1 below shows the existing and planned gas export pipelines. Table 1 presents the list of gas export pipelines toward Europe with the related capacities and export destination countries. It can be see that all existing export pipelines to Europe reach a combined capacity of some 256 bcm/yr, which is to be compared to present gas flows to Europe (including Turkey, excluding CIS) in the order of 140 bcm (2011) and to contracted Take-or-Pay guaranteed annual export volumes up to 2020-2025. Already today, there is therefore an almost 70-80% overcapacity in export infrastructure (counting also the two recently built Nord Stream pipelines connecting directly Germany to Russia across the Baltic Sea.

Fig.1: Major Russian gas export pipeline routes



Tab.1: Major Russian gas export pipeline capacities toward Russia

Pipeline	Capacity	Destination of exports
Via Ukraine:		
Orenburg-Western border (Uzhgorod)	26	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Urengoy-Uzhgorod	28	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Yamburg-Western border (Uzhgorod)	26	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Dolina-Uzhgorod - 2 lines	17	Slovakia, Czech, Austria, Germany, France, Switzerland, Slovenia, Italy
Komarno-Drozdowichi - 2 lines	5	Poland
Uzhgorod-Beregovo - 2 lines	13	Hungary, Serbia, Bosnia
Hust - Satu-Mare	2	Romania
Ananyev-Tiraspol'-Izmail & Shebelinka-Izmail - 3 lines	27	Romania, Bulgaria, Greece, Turkey, Macedonia
Total via Ukraine:	**143**	
Via Belarus:		
Yamal-Europe (Torzhok-Kondratki-Frankfurt/Oder)	31	Poland, Germany, Netherlands, Belgium, UK
Kobrin-Brest	5	Poland
Total via Belarus:	**35**	
St. Petersburg-Finland - 2 lines	7	Finland
Blue Stream (design capacity)	16	Turkey (possible to Greece, Macedonia)
Nord Stream 1 and 2	55	Germany, France, Czech and other
TOTAL EXISTING EXPORT CAPACITY:	**256**	
NEW PIPELINES:		
South Stream	63	Bulgaria, Serbia, Greece, Italy and other
Nord Stream 3 and 4	55	Germany, France, Czech and other
TOTAL PLANNED EXPORT CAPACITY:	**374**	
Contracted exports guaranteed for 2020-2025 (Take-or-Pay volumes)	**140**	

3. Russian gas transit through Ukraine

- Historical overview of Russia-Ukraine gas transit relations and resulting Russian export strategies

Until the break-up of the Soviet Union in 1991, all gas export to Western Europe happened across the Ukraine-Slovak border as crossing Poland and in particular the German Democratic Republic (GDR) was by the soviets considered politically not sufficiently reliable.

After the break-up of the Soviet Union, Ukraine continued to represent the main route for Russian gas exports to Europe due to the fact that all existing pipeline infrastructure was crossing Ukraine and as Ukraine's storage capacities on its western border were particularly valuable to Russia.

Gas conflicts between Russia and Ukraine go back to the immediate aftermath of the independence of the two countries. Regular transit conflicts emerged as transit usually became a part of the price dispute on the Russian gas price for the Ukrainian domestic market.

Post Soviet economic slump in both Russia and Ukraine during the 1990s high-lightened the mutual dependence of the two countries. On the one side, for Russia, European gas sales were a crucial source of reliable income in hard times, while on the other side, Ukraine (along with other CIS countries), which was heavily dependent on Russian gas (Ukraine has one of the highest energy and gas intensive economies worldwide) struggled to pay for gas but had no way of replacing it as a fuel source. The 1990s were thus characterized by large scale gas deliveries to Ukraine at very low prices (which probably did not even cover cost of delivery) and at the same time the accumulation of Ukrainian debts to Russia linked to domestic non-payments. The resulting disputes lead Gazprom to cut off supplies to Ukraine on several occasions during the 1990s. As no separation between the transit gas network and the domestic gas network exists in Ukraine, Ukrainian customers usually served themselves from the transit volumes which Russia called theft of gas through the transit system. Russia regularly pressured Ukraine to make political and/or economic concessions in exchange of erasing the accumulating gas debt. But as the Ukrainian non-payment issue was structural, as soon as a gas debt had been erased, it started again to accumulate. Russia also pressured

Ukraine to exchange equity in the transit network and storage capacity for gas debts, but Ukraine never gave in on this point.

As during the first decade of the present millennium (more precisely since 2002) World oil prices started to rise steadily, therefore increasing also European gas prices, the differential between European prices and those charged to the CIS countries widened sharply. Gazprom called for CIS prices to be raised to the level of European Netback while all countries struggled to increase domestic gas pricing. The Russian Federation Government influence was responsible for the Netback Principle to be applied unevenly. Countries which agreed to share ownership of their pipeline system with Russia (eg. Belorus and Armenia) were able to negotiate much longer timetables for import price increases. On the other hand, Gazprom was allowed to raise prices more rapidly in countries whose governments showed a hostile attitude towards Moscow (e.g. Georgia and Ukraine).

But it was not until January 2006, one year after the Orange revolution had taken place in Ukraine which resulted in a strongly pro-Western and anti-Russian Government, that the first major Ukraine-Russia gas crises erupted in January 2006. Following disagreement on prices, Russia cut off supplies to Ukraine for 3 days, Ukraine diverted volumes destined to Europe, and as a consequence supply to some Central European countries fell briefly, but supplies were never cut off completely on that occasion. Due to the pro-European government in Kiev, the EU was fully supporting Ukraine and strongly blaming Russia for the crisis.

Already in the 1990s, a pipeline across Poland to reach Germany was built to reduce Ukrainian transit dependence from 100% to 80%. But after some disputes with Poland and Belorus, Russia announced in 2001 its wish to build a submarine pipeline (Nord Stream) across the Baltic Sea to connect directly Russia to Germany, its major western European gas market. But after the 2006 Ukraine-Russia gas crises, Russia intensifies its diversification of routes strategy and announced also building South Stream across the Black Sea, thus further reducing strongly its dependence on Ukraine.

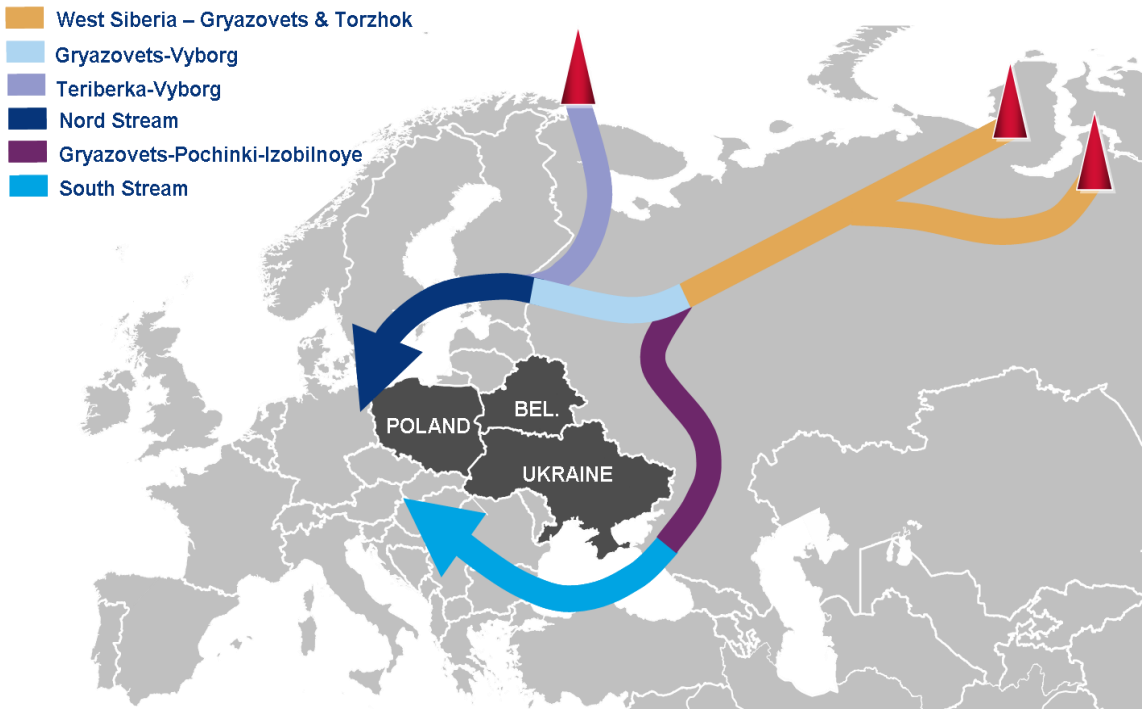
The second major gas crises between Russia and Ukraine in January 2009 became a very high profile event. As a result, the transit of Russian gas through Ukraine was completely cut for two weeks which resulted in a humanitarian crisis in several Central and Eastern European

countries which were strongly dependent on Russian gas supplies across Ukraine. This dispute has resulted in long term economic consequences and affected the reputation of Russia as a reliable supplier and of Ukraine as a reliable transit country.

The policy responses were different in Europe, Ukraine and Russia:

- The EU's response to the gas crises was to strengthen the internal market, to foster gas flows and gas sources diversification (including building LNG receiving terminals in Central and South-East Europe, pursuing the Southern or 4th corridor to bring in gas from the Caspian region without crossing Russia), and to pursue climate change policies (energy efficiency, renewables, clean coal with CCS, nuclear).
- Ukraine's response to the crises, was to develop strategies aimed at reducing dependence on imported gas: reducing the share of gas in the fuel mix, implement energy saving measures, increasing own gas production, etc. However, all these policies were already attempted in the 1990s and 2000s, and already then they have failed because of political and economic weaknesses.
- Russia's response to the crisis was first to push for ownership of the Ukrainian transit system by a consortium involving Ukrainian, Russian and European gas companies and – as it became increasingly clear that this option was not acceptable for Ukraine - promote gas bypass pipelines (North Stream and South Stream). Figure 2 illustrates this strategy.

Fig.2: Gazprom's Strategy to Diversify Supply Routes and Bypass Transit Countries



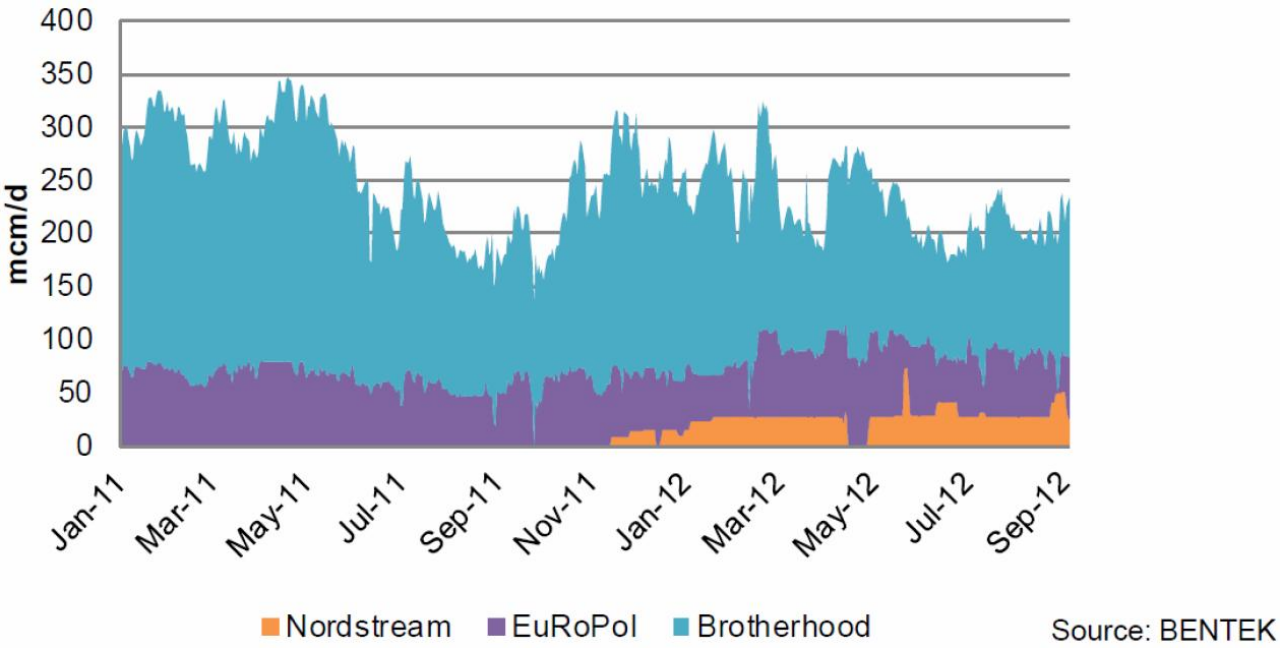
Source: Wood Mackenzie

Russia is advancing rapidly in implementing its gas route diversification policy: in November 2011 the first string of Nord Stream had been commissioned, and in November 2012 the first line of Nord Stream has been commissioned. Together, these two lines represent 55 bcm of annual capacity, or almost half (47%) of Russian gas exports into the EU.

Also, in December 2012, Gazprom and the other South Stream partners have announced final investment decision (FID) for building the first string of South Stream (15.5 bcm/yr). Eventually, the four South Stream strings should represent a combined capacity of 63 bcm/yr to be available before 2020.

As can be seen in Figure 3, gas transits across Ukraine (Brotherhood pipeline) have been declining recently as Russia was able to build bypass pipelines (first EuroPol across Belorus and Poland, and then Nordstream-1).

Fig.3: Export of Russian gas in 2011-2012



- *Ukrainian gas transmission system (GTS)*

The Gas Transmission System (GTS) of Ukraine is a sophisticated technological object (see Figure 4) and an integrated part of the Unified Gas Supply System (UGSS) of the former USSR. The UGSS was build as a complex mechanism for synchronized operation of gas production, transmission, storage and distribution activities. In the 1970s and 1980s, the Ukrainian part of the UGSS was developed and expanded into a huge terminal for exports of large volumes of Russian gas to Europe.

After the division of the UGSS, the gas supply systems of Russia and Ukraine continued their synchronous and coordinated work until the first partial cutoff of 2006 and the total cutoff of January 2009.

Until January 2009, Russia was supplying to the GTS of Ukraine up to 185 bcm/year of gas, including some 120 bcm/year of gas for exports to Europe, Turkey and Moldova. In 1999-2008, the daily flow of gas to Ukraine was fluctuating from 400 to 570 million cubic meters (mmcm). Daily export flows to Europe were up to 400 mmcm. In 2003-2008, daily exports have never been below 235 mmcm.

GTS of Ukraine, just as the GTS of Russia, is not just a set of separate pipelines running from point A to point B. For example, the transit pipelines Urengoy-Uzhgorod, Yamburg-Western border and Orenburg Western border are also transporting gas to the Ukrainian territory. The Balkan pipeline receives gas from two trunklines: Ananiev-Tiraspol-Izmail (one line) and Shebelinka-Krivoi Rog-Izmail (two lines at Orlovka). To the Ananiev compressor station, gas is delivered by the Yelets-Kremenchug-Krovoi Rog (YKKR or EKKP in Russian) and the Kremenchug-Ananiev pipeline. These pipeline routes of Southern Ukraine deliver gas both to the domestic consumers and for exports. Synchronous operation of all the lines is required to fill the Balkan pipeline in winter period.

Fig.4: Ukrainian gas transmission system (GTS)

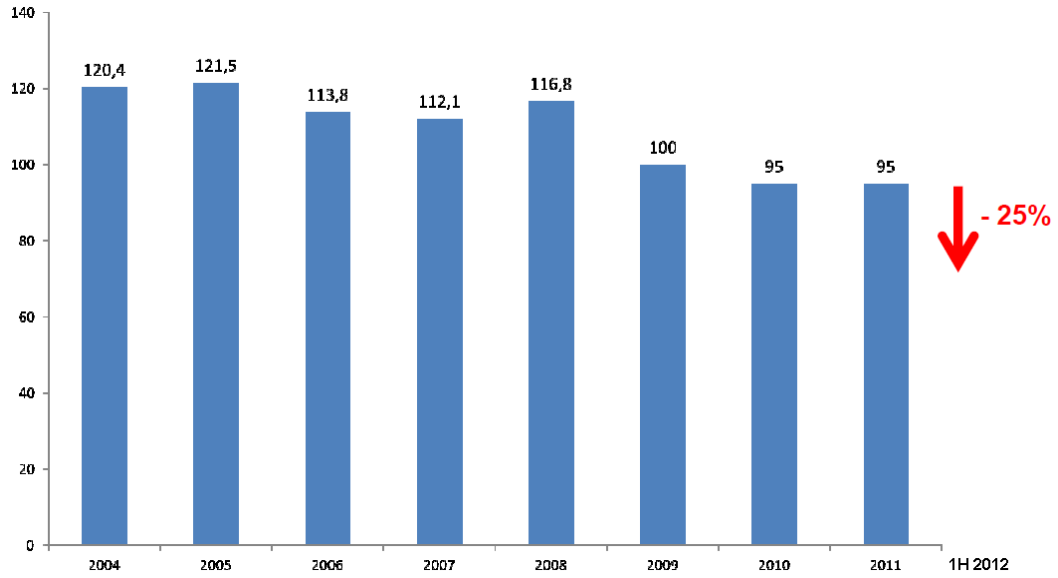
- *The role of Ukraine for the Russian gas export*

Currently, Ukraine is a major transit country for Russian gas and cannot be replaced even by maximum loading of alternative routes. The annual initial gas transit capacity via Ukraine totalled 175 bcm. Deterioration of the Ukrainian GTS leads to declining real transportation capacity, which is estimated currently at around 115 bcm. Russian gas transit through Ukraine

in 2011 was 98 bcm (of which 95 bcm – to Europe and 3 bcm – to CIS countries). During the last four years gas flows through Ukraine have been steadily declining, this trend has become very obvious in spring 2012, when transit through Ukraine halved. This trend is explained by increasing supply through the Nord Stream, as well as through Belarus. In 1H 2012 Russian gas transit through Ukraine decreased by 24% compared to 2011 (to 48.7 bcm) and in this period to Velke Kapusany on the Ukraine-Slovakia border only about 26.4 bcm were delivered, compared with 40 bcm in H1 2011.

High Russian dependence on the Ukrainian GTS and numerous transit disputes form a major constraint on the Russian gas export strategy. Permanent political and energy related frictions, and even confrontations, between Russia and Ukraine and Ukraine's political domestic instability as well, make any intergovernmental agreement a subject to permanent claims for review and do not provide a stable relationship.

Fig.5: Russian gas transit through Ukraine declines steadily



- *Gas contractual relationship between Russia and Ukraine*

As mentioned above, the January 2009 disagreement on gas prices between Russia and Ukraine resulted in supply disruptions in 18 European countries reporting major drops in or complete cut-offs of their gas supplies transported through Ukraine from Russia.

The gas contract (2009-2019) between Gazprom and Naftogaz which was signed to end the crises on January 19th 2009 by Miller (Gazprom) and Dubina (Naftogaz) following the agreement between Putin and Timoshenko, then prime ministers of Ukraine and Russia, respectively, is still the only official ground for gas trade between the countries and it sets the gas prices for the next ten years.

On November 20, 2009, the gas deal of January 19, 2009, was altered after a meeting between Tymoshenko and Putin in Yalta; meaning Ukraine would not be fined for buying less gas then the old contract stipulated, this was done in view of the 2009 Ukrainian financial crises. On November 24, 2009 Gazprom and Naftogaz signed these supplements to the contract of 19 January 2009 on the purchase and sale of natural gas; according to the supplements, the annual contracted amount of gas to be supplied to Ukraine in 2010 has been set at 33.75 bcm , instead of the 52 bcm contracted earlier. The documents signed by the sides also stipulated that there will be no fines related to the amount of gas consumed by Naftogaz in 2009.

On 21 April 2010 in Kharkov, presidents Yanukovych and Medvedev signed the Russian Ukrainian Naval Base for Gas treaty, widely referred to as the Kharkov Accords. According to this treaty, the Russian lease on naval facilities in Crimea was extended beyond 2017 by 25 years (to 2042) with an additional 5 year renewal option (to 2047) in exchange for a multiyear 30% discounted contract to provide Ukraine with Russian gas. As a result in June 2010, Ukraine paid to Gazprom around 234 $/1,000 m3 instead of 330 $/1,000 m3 (according to initial formula). Kiev says this deal signed in January 2009 is unfairly favorable to Russia. In October 2011, Tymoshenko was sentenced to seven years in prison for abusing authority while negotiating the gas agreement with Russia.

Naftogaz had tried to cut Russian gas imports to 27 bcm in 2012 and in 2013 (from 40 bcm in 2011 and 52 bcm in the contract), as Kiev considers it too expensive. During the first 8 months 2012 Ukraine has already reduced Russian gas import by 34%. In the third quarter of 2012 Naftogaz payed 426 $/1000 m3 for Russian gas and has been seeking to reduce it to 230 $/1000 m3. Ukraine is seriously regarding an idea to break Naftogaz and offer a part of it in return to gas price concession.

Gazprom has not agreed to cut term gas supplies to Kiev neither in 2012, nor in 2013. "The contract signed with Ukraine envisages Russian gas supplies at 52 bcm/year. There have been no agreements to cut volumes," Miller said in Kiev in June 2012. Gazprom insists that the contract's take-or-pay minimum (80%) must be applied to the baseline of 52 bcm, which would commit Naftogaz to import 41.6 bcm from Russia in 2012. Gazprom argues that according to the contract, the volumes for 2013 could be renegotiated not later than 1 June 2012, after that date it is too late to discuss it.

Gazprom gives clear signals that it is ready to provide big price discount only if it will be allowed to buy the Ukrainian GTS. In March 2012, Gazprom suggested it was ready to cut the price of gas supplied to Ukraine by 10% provided it agreed to import at least 33 bcm in 2012. Ukraine rejected the proposal, seeking to instead change the 10-year gas deal signed in January 2009.

It is unlikely to expect fundamental changes in Russia-Ukrainian relationship even after the Ukrainian parliament elections of November 2012 were held. In October 2012, Russia proposed Ukraine to join the Custom Union (launched in 2010 by Russia, Belarus and Kazakhstan) in return to a gas import price decreased to just 160 $/1000m3.

- *The role of Ukrainian underground gas storage facilities for Russia*

Ukraine has 13 underground gas storage (UGS) facilities with a working capacity of 31 bcm. At maximum storage and output rates, Ukraine's storage facilities can withdraw 250 million cubic meters a day.

UGSs were built in Soviet time to provide export flows seasonal flexibility and until now cannot be replaced by the Russian UGSs. According to the Russian official statistics the summer/ winter flexibility of Russian is something like 60/40 (% winter vs summer offtake). Russia badly needs this storage for reliable supplies to Europe: gas supplies shortfall in February 2012, when Gazprom failed to meet European demand for gas during an unprecedented cold snap, which led to at least eight EU members - including Italy, France, Germany and Austria - reporting a cut in gas supplies from Russia, resulted from a lack of agreement on the Ukrainian UGSs utilization by Gazprom in 2010 and in 2011.

Theoretically, building storages in Europe and inside Russia close to the western border could help Russia to modulate without Ukraine in the longer term, but it does not seem feasible until 2025-2030.

In June 2012, Russia started to book again capacities in the Ukrainian storages. Miller said Gazprom sees no reason to cut the price, but is ready to provide additional financial support to ensure Ukraine gets enough gas for underground storage ahead of the winter demand. In early June 2012 Gazprom made a prepayment of $2 billion for transit of Russian gas via Ukraine, in order to provide additional funding for filling UGSs. Until the end of September Ukraine has pumped 11.4 bcm into its UGSs.

- *A critical moment has come for the Ukrainian GTS, but Ukraine lacks the necessary investments*

Ukraine is now at a point of no-return concerning the GTS functioning: without huge investments its capacity is shrinking very rapidly (by about 2-3 bcm/yr). According to rough estimates, investment needs in 2012-2018 are assumed to amount to $6.5 bln.

Ukraine itself cannot afford these investments: in 2010 Ukrtransgas has invested just $212 mln., in 2011 some $300 mln. Naftogaz Ukrainy is trying to upgrade its gas transmission system: Naftogaz began modernizing the 28 bcm Urengoi-Pomary-Uzhgorod pipeline – the biggest pipeline in Ukraine – in 2011. In August 2012 Naftogaz engaged Ferrostal Industrieanlagen to work on the Soyuz pipeline. The aim is to cut fuel gas by 28% when it is working at full load (Ukraine uses 7.5 bcm/yr running its transportation system), and to expand the lifespan of turbines in the gas compressor plants by at least 15 years. But these measures can only slow down the deterioration.

In December 2011, the Ukrainian Government announced that the price of GTS for the parties interested in triple-side consortia is estimated at $20 bln. + $5-7 bln. necessary for the GTS modernization. In August 2012 “Baker Tilly Ukraine” finalized estimation of the Ukrainian GTS value (it was asked by Naftogaz to make this study in order to validate the price of GTS for the consortium), but the results were not published yet.

- *A triple-side consortium*

The joint venture, which would include national energy firm Naftogaz Ukrayiny, Gazprom and an unidentified European company (a number of European companies have been named in the past as likely partners: major gas customers such as Italy's Eni, Germany's E.ON Ruhrgas and GDF Suez have all appeared in such lists) has been under discussion for the last 10 years without any success. Ukraine has always backed away from any firm agreement, perhaps fearing that without ownership of the lines it would lose what little power it holds over Russia.

However, the two countries have still not abandoned decade-old plans to form a joint venture involving also a European partner, to operate the entire transport system. This is despite the animosity and resentment that the two sides often display towards each other. The talks in December 2011 and July 2012 ended with nothing decided as the two sides have disagreed on the value of the network, with Gazprom doubting it was above $10 billion.

- *Foreign investors are not highly motivated to invest in the Ukrainian GTS*

Moreover, foreign investors are not highly motivated to invest in the Ukrainian GTS. The reasons include a general unfavorable investment climate (during the first half of 2010, FDI from Europe have decreased by a factor of 14, reaching a historical minimum); financial constraints due to the economic crisis hitting heavily Ukraine; lack of financial warranty and high political risks: therefore lack of cover by the ECA's of international lenders; the desire to diversify supply and support to the alternative routes (all major European companies are involved in these projects):

- BASF (represented by Wintershall), E.ON Ruhrgas, GDF, Gasunie – in Nord Stream
- ENI and EDF – in South Stream
- OMV, MOL, Bulgargaz, Transgaz, BOTAS and RWE (might reconsider its participation) – in Nabucco

- *Russia seems to be the most interested party in Ukrainian GTS, but Russia is not (or only very difficultly) acceptable for the Ukrainian political elites.*

There is still a small chance that Gazprom manages to secure a deal with Ukraine to shift ownership and management of its pipeline system into a consortium, in which Gazprom holds a controlling stake (maybe in association with European minority partner(s) who import

Russian gas). Gazprom insists to have at least 50% stake in this JV. Only this deal could conceivably prompt Gazprom to reduce the projected volumes for South Stream, but not to abandon the project for geopolitical reasons and as a deterrent with respect to Ukraine. However, any Ukrainian politician is very well aware that the day he sells Ukrainian GTS to Gazprom will be the last day of his (or her) political career. Discussions on JV or two-side gas transportation consortia held previously have all failed.

- *Despite all contradictions, Russia and Ukraine have to settle their relationship in the future due to their strong interdependence.*

Ukraine needs the Russian gas supply for domestic consumption, which provides for nearly 100% of Ukrainian gas imports. Transit of the Russian gas provides substantial budget incomes for Ukraine ($3.2 bln. in 2011). Ukraine's budget is in need of the transit fee for the transit of Russian gas & the rent for the use of Sevastopol by the Russian fleet as well. Ukraine needs also Russian participation in the revamping of its GTS & other industrial & agriculture projects. Without enough confirmed transit volumes, Ukrainian GTS will lose its strategic role. Ukraine as the biggest CIS state (after Russia) is critical for Russia`s "post-imperial" ambitions to remain the center of post-Soviet economic space. Russia needs Ukraine to set up the custom union it wants with Belarus, Ukraine & Kazakhstan. Further Ukrainian movement towards NATO and European integration is absolutely politically unacceptable for Russia. Also, Russia needs a sea access in Sevastopol for its fleet.

The structure of the UGSS of the former Soviet Union makes thus Russia and Ukraine natural partners, strongly dependent on each other. Moreover, at least in the medium term, Russia cannot fulfill its export obligations without Ukrainian transit and Ukrainian UGSs are critical for seasonal flexibility of Russian gas supplies to Europe.

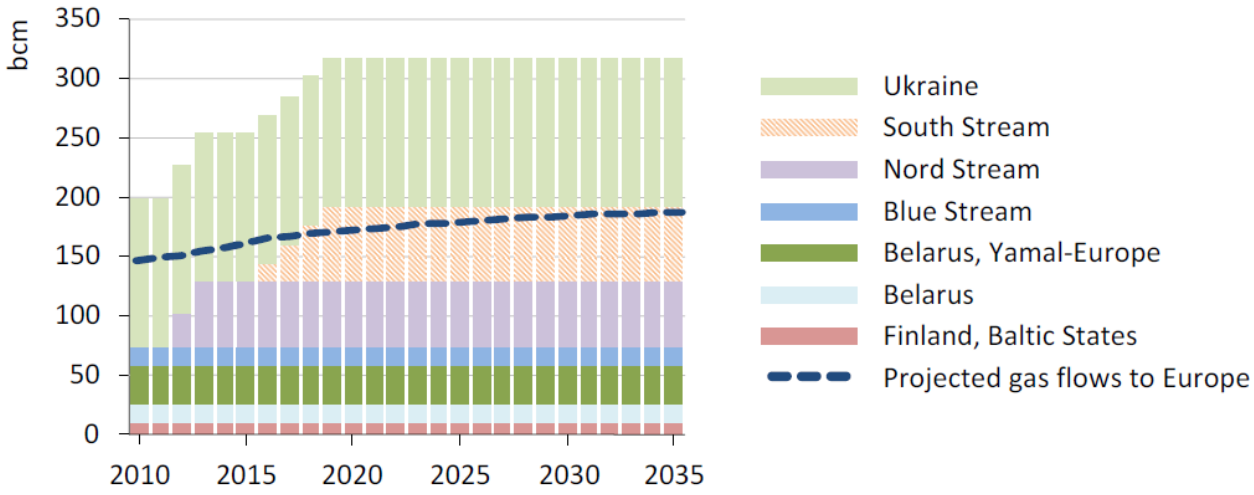
So most probably even when South Stream is built, Russia will leave some transit volumes for Ukraine in order to have a leverage on it.

- *With Nord Stream 1-2, South Stream 1-2-3-4 and an increased Belorussian transit, Ukraine is losing its strategic position as a gas transit hub.*

In 2011, Gazprom mentioned several times that 2/3 pf the gas transported through South Stream will be "old gas" (redirected from Ukraine) and just 1/3 "new gas".

Figure 6 shows that given the expected expansion in gas export pipeline capacity, the Ukrainian UGS is theoretically no longer needed.

Fig.6: Projected gas flows from Russia to Europe and growth in gas pipeline capacity



Source: WEO2011, IEA

- Ukraine has very limited possibilities to change its fuel mix, though it is making great efforts

According to the Ukrainian Energy Ministry, the share of gas in 2009 was 38%, the share of coal 28%. According to the "National Strategy of Ukraine until 2030", gas consumption by 2030 should reach 57 mtoe (19%), while coal should reach 101 mtoe (33.4%).

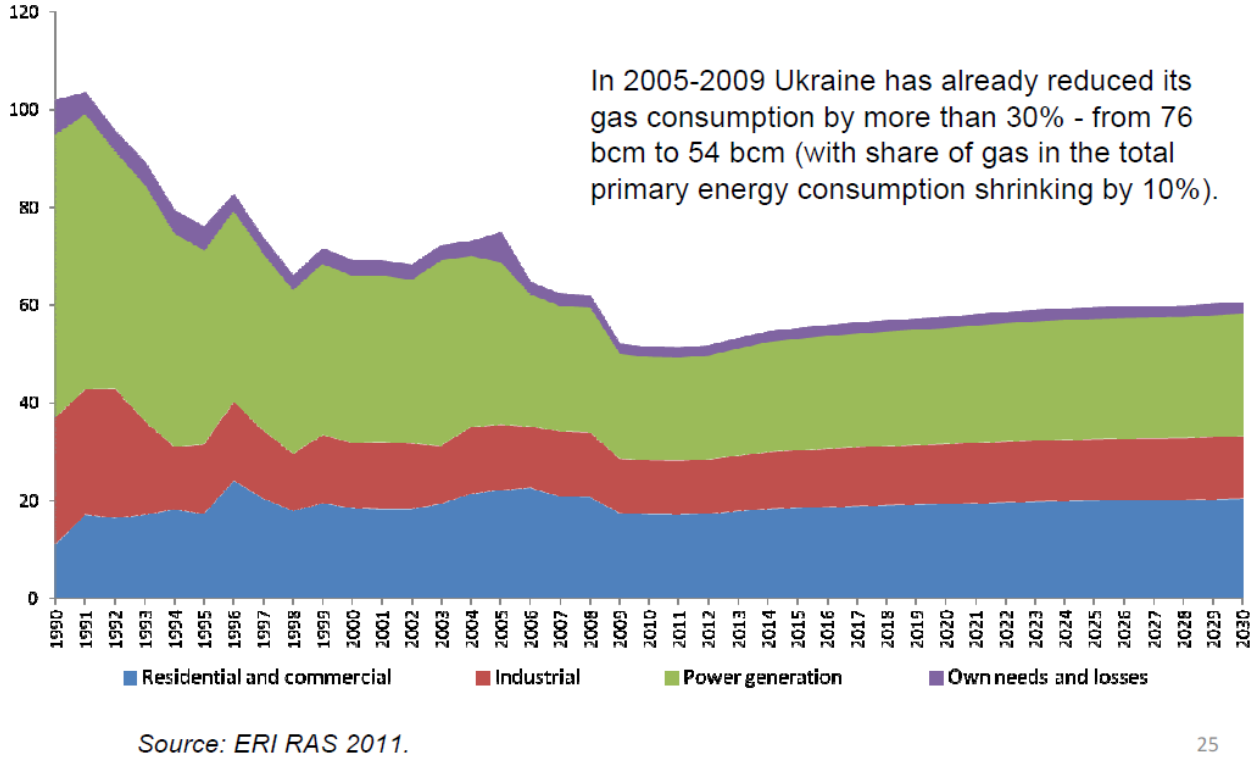
- Oil: With the current oil production of 2.6 mln. t according to the Energy Strategy it should reach 5.3 mln. t by 2015 and then stabilize at 5.4 mln. t.
- Coal: According to the Energy Strategy coal production should reach up to 90 mln. t of marketable coal which will put enormous pressure on the budget and create many social and environmental problems. Though in 2012 Ukraine signed a deal with China Development Bank on $3,66 bln. for gas to coal replacement, it is difficult to expect huge volumes of this replacement.
- Nuclear: according to the Ukrainian Energy Strategy, electricity generation by nuclear power plants should reach 158.9 bln. kWh by 2020 and 219.0 bln. kWh by 2030. Ukraine plans to increase nuclear capacities up to 29.5 bln. kW by 2030, but assuming

decommissioning of the old blocks, this program will demand enormous investments in order to construct new nuclear plants replacing the old ones plus completely new capacities.

- Renewables: according to the State Environmental Strategy, up to 2020 it is planned to increase the share of renewable from the current very low levels (approximately 1%) up to 25% by 2020 in order to replace 20-30% of the imported energy resources. These figures seem to be absolutely unrealistic. So far, the previous ambitious plans of wind plant construction, solar and biomass development were not achieved. Just 181 MW of planned 2000 MW of wind capacities were build in 2010. In the current institutional framework this business does not seem to be attractive for the investors.

Ukrainian domestic gas consumption has already significantly reduced, a further strong decline is unlikely (see Figure 7).

Fig.7: expected evolution of Ukraine's gas demand by sector



Source: ERI RAS 2011. 25

- Options for the diversification of gas supply sources

Own conventional gas production: According to the Energy Strategy, domestic gas production should reach 28.5 bcm by 2030. Vice-prime minister Kluev has announced that

during the next decade Ukraine will increase gas production up to 30-32 bcm or even 40 bcm. But so far in 2010 Naftogaz of Ukraine has decreased gas production by 5.3% compared to 2009 to just 20 bcm. In August 2012 Ukraine signed a PSA agreement with ExxonMobil for Black Sea off-shore development with potential production of up to 3-4 bcm.

Own shale gas production: Ukraine (and Europe generally) has completely different internal conditions for unconventional gas production compared to the US (geological conditions, level of infrastructure development, abundance of service companies, industrial regulation, pricing and hedging system, land and environmental regulation). According to Wood MacKenzie estimates, shale gas production in Europe will have much higher costs than in the North America – about 10 $/MBtu compared to 4-7 $/MBtu. There are no detailed cost estimates for Ukrainian shale production, but anyway this is going to be an expensive gas. Moreover there were no profound studies on Ukrainian shale gas reserves estimation, so far it`s mainly speculation without real drilling. In May 2012 Ukraine granted licenses for shale gas development to Shell and Chevron.

Black Sea LNG regas project: In August 2012, the Ukrainian Government approved a feasibility study for the LNG regasification terminal construction in the Odessa region (see Figure 8). For the first stage (2016) the project is to use a 5 bcm FLNG (floating LNG) while for the second stage (by 2018) an on-shore 10 bcm LNG-regasification terminal should be built. Ukraine is providing state guarantees for the project. Spanish Enagas and American Excelerate Energy propose to be partners in the project. In June 2012 Qatar signed MOU for LNG supplies to Ukraine. Construction of a standard LNG regas facility requires $1.1 - $1.8 bln. investments and takes 2-2.5 years (in the best case, given that all permission documentation is provided). Payback period for such projects is at least 10 years (with full utilization – but currently just 40% of regas capacities are utilized globally). There are serious technological challenges including Turkish straits traffic and the need to deepen the sea for the port. This option does therefore not seem very likely.

Fig.8: Ukraine Black sea LNG terminal project near Odessa

White Stream project (bringing gas from Azerbaijan through Georgia and then through off-shore pipeline crossing Black Sea) seems unrealistic due to unavailability of Azeri gas and lack of interested investors. Central Asian gas needs to transit through Russia, which is definitely not going to provide this transit.

Reverse flow from Slovakia. On May 11, 2012 Naftogaz announced a deal with RWE Supply & Trading for gas supply to Ukraine (without disclosing any details of the deal). This option seems to be most realistic as Ukrainian GTS can work in the reverse mode for transportation of ~25-30 bcm.

4. Russian gas transit through Belarus

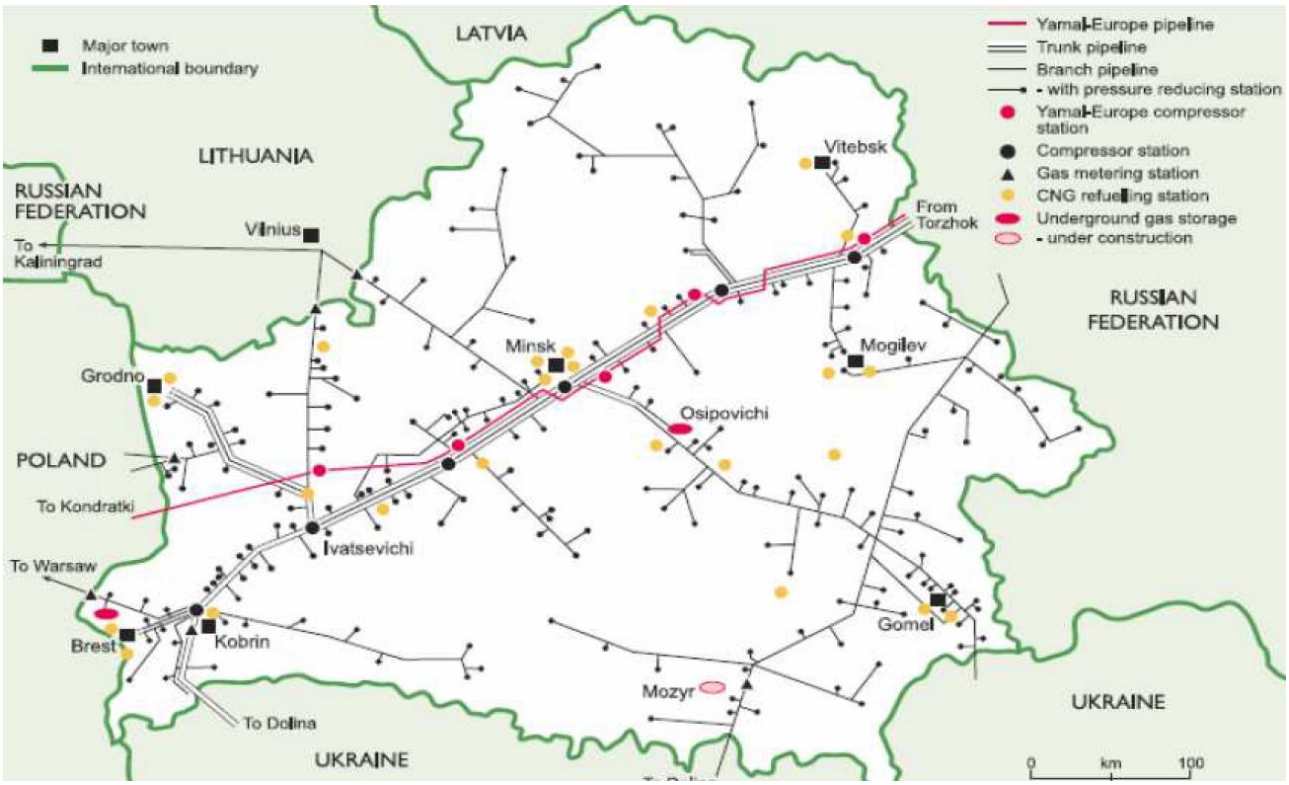
The second most important transit country is Belarus delivering about 20% of Russia's gas exports to Europe. The issue concerning the reliability of this transit route became especially acute after the 2004 Russo-Belorussian conflict. Belarus agreed to transfer control over its GTS to Russia and now sees increasing transit volumes.

Most of Russian gas crosses Belarus through the Yamal-Europe pipeline which passes through Torzhok in Russia, and leaves Belarus at Kondratki in Poland. The pipeline has a capacity of around 33 bcm. Moreover, there is also the Beltransgas pipeline system able to provide gas transit for about 13-15 bcm. Gazprom paid totally $5 bln. for Beltransgaz control

and currently prepares an investment program for Belarus GTS modernization. According to this document, $1.5-2 bln. will be invested in the system modernization.

Russian gas transit through Belarus in 2011 was 42.8 bcm; in 2012 it has grown and should reach 44.5 bcm. Gazprom definitely wants to increase Belarus transit as much as possible in order to decrease the Ukrainian flows. Belarus domestic gas demand is projected to remain stable at ~20 bcm/y, as prices provided by Russia in return for the control over GTS are close to the Russian domestic prices.

Fig.9: Belarus Gas Transmission System



The transnational Yamal – Europe-1 gas pipeline runs across four countries: Russia, Belarus, Poland and Germany. This new export corridor increased flexibility and reliability of Russian gas supply to Western Europe. The European Union qualified the Yamal – Europe as the top-priority investment project implemented as part of the Trans-European Network (TEN).

The gas pipeline construction started in 1994 and in 2006 the Yamal – Europe gas pipeline reached its design capacity of 32.9 bcm after the last compressor station was commissioned.

The pipeline system consists of 14 compressor stations, a pipe diameter of 1,420 mm, and a total length of over 2,000 km.

Fig. 10: Yamal-Europe-1

The Yamal-2 pipeline project (33 bcm) which would bypass Ukraine but connect across Poland to the the Slovak pipeline system therefore allowing to additionally bypass Ukraine was discussed in the early 2000, when Yamal-Europe-1 was close to completion. But after all disputes and problems with Poland and Belarus, Gazprom abandoned the project. It is not in the list of Gazprom priority projects (and not even in the list of the projects "under review"). And this attitude is not likely to change: Poland is not regarded as a desirable partner by Russia. NS-3 and 4 seem to be much more probable compared to this option.

5. South Stream

Even though in an ideal world the most economic and logical option would be to collectively upgrade the Ukrainian gas transmission system, to separate the domestic pipeline system from the transit pipeline system, and to create an independent transmission system operator in charge of operating the transit section, it seems that in the real world the most attractive

option for Russia is building South Stream. In fact, the political and economic situation in Ukraine and the Russian geopolitical interest in the Balkans favor South Stream.

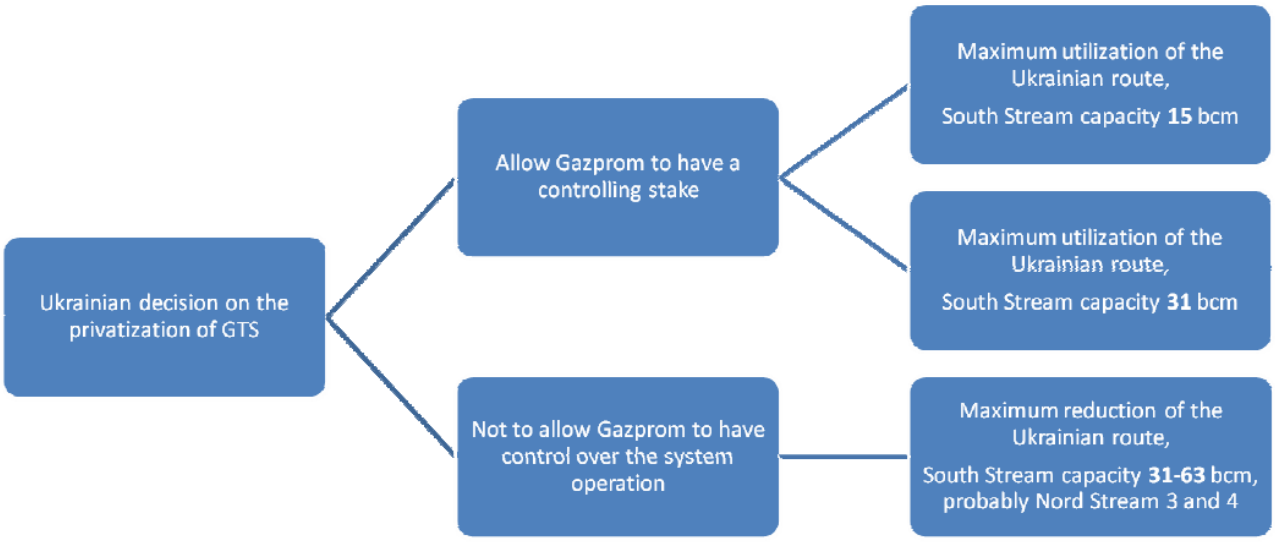
We have presented above the difficulties for reaching a deal on a settlement of the Ukraine-Russia gas transit issue. Let us just add that Russia claims to have lost about 2 bln dollars during the two weeks of gas flow interruption in January 2009 (just counting gas not delivered times the gas price at the time, and without accounting of the image loss of not being recognized any more as a reliable supplier). So, for Russia, even though building South Stream is very expensive, it is like buying an insurance against potential future gas flow interruptions.

Building South Stream Gazprom claims will cost about 10 bn Euros for the off-shore part (for the full four strings and 63 bcm/yr) - though the author of this paper thinks this cost to be quite higher - and 6 bn Euros for gas pipeline construction on the European part. With this option the transit risk will have been eliminated, the gas price for Ukraine will be 410 $/1000m3, there will be little dependence on the Ukrainian political situation, and from a Russian standpoint, increased geopolitical influence in Central and eastern Europe and the Balkans.

Buying the Ukrainian GTS will cost about 20 bn dollar (price requested by Ukraine), to which some 5-7 bn dollars for GTS modernization will have to be paid. In addition, annual transit payments of 3.2 bn dollar will have to be added. This goes with a continued transit risk and a lower gas price for Ukraine in the order of 230 $/1000m3. Also, Russia will continue its dependence on the Ukrainian political situation and have a weaker negotiating position vis-à-vis Ukraine.

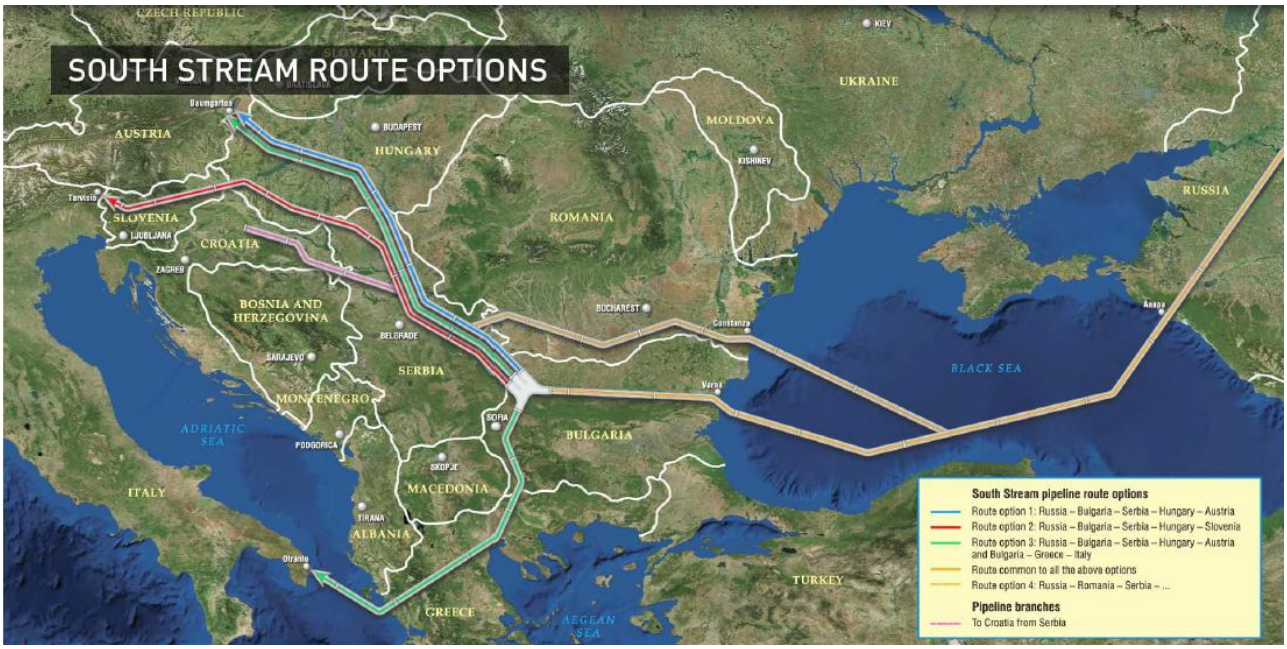
Russia will thus in any case start construction of South Stream as early as possible, but it could be that – if Russia and Ukraine find some kind of compromise - not all four strings are finally laid and therefore the final capacity will be below the planned 63 bcm/yr.

Fig. 11: Decision making tree: agreement with Russia on Ukrainain GTS operational control will lead to lower South stream capacity, but not to the project abandonment



Indeed, for Russia, the South Stream project is extremely important in terms of geopolitics and deterrent with respect to Ukraine. The Russian Government will never completely abandon the project, unless there is a comprehensive agreement with Ukraine as part of a broad economic union of main post soviet republics and the support and guarantee of the EU.

Fig. 12: Initially there was a big variety of on-shore routes under consideration



One of the options for South Stream's route was to bring gas to the Austrian gas hub in Baumgarten. But in December 2011 Gazprom announced that it has picked Italy over Austria as the destination of South Stream, after the EU had blocked a Gazprom plan to buy part of a trading platform in Austria in 2011 (the European Commission had blocked Gazprom's acquisition of a 50% stake in the gas trading platform of the Central European Gas Hub (CEGH)). Gazprom`s officials were saying that there will be no transit through Austria, only a spur will run to Austria. The decision was thus taken to develop a new hub in Northern Italy.

By the end of 2011 Gazprom has announced the route of South Stream in Europe: through Bulgaria (with a pipeline branch to Greece), Serbia (with pipeline branches to Bosnia and Croatia), Hungary and Slovenia ending at the Italian border without a direct branch to Austria. Gazprom also abandoned the idea to build a pipeline through Greece and the Adriatic Sea to Southern Italy.

The decision was taken to build the pipeline through Bulgaria and not Romania (as it was previously discussed because of the negative attitude of the Bulgarian Government – but finally an agreement with Bulgaria was reached when Russia provided 11% gas price discount for Bulgaria).

Fig.13: Final South Stream route according to Gazprom's feasibility study submitted to the State Expertise Authority

	Russia (UGSS expansion)	Offshore part	European part (onshore)	Total
Length, km	2500	925	1730	4300
Capacity, bcm (at the entry point in Bulgaria)	63	63		63
CAPEX, bln. Euro	9,1	10,0	6,1	25,2

Figure 13 shows the Final South Stream route according to Gazprom's feasibility study submitted to the State Expertise Authority. The State Expertise Authority is a so called "autonomous Federal body" which depends on the Ministry of Regional Development. All Russian large scale projects in all sectors (by Gazprom, Rosatom, Russian Railroads, RosHydro, power generators, Rosneft etc...) have to be approved by the State Expertise Authority. Obtaining its permission is a very bureaucratic and sophisticated process, it has the authority to stop any project it supposes not to comply with the security requirements (which are numerous and contradictory in Russia: they even stopped the Gazpromneft`s platform for the Prirazlomnoe project in Arctic offshore notwithstanding the fact that it is a state priority oil project). So, as Gazprom has presented Tarvisio as terminal for South Stream, it will be quite difficult to change the destination after the expertise has been completed, or they will have to start all this huge paper work again. There is no 100% guarantee that the Government will not change its mind concerning the route, but in that case the lead time will be at least 1 year longer due to the work of the State Expertise Authority.

The South Stream consortium has signed intergovernmental agreements with Austria, Bulgaria, Hungary, Greece, Serbia, Slovenia and Croatia. Joint project companies (JPC) have been set up in Serbia, Hungary, Greece for the offshore section. Negotiations are underway with other participants. The offshore survey has been finalized for the Russian, Bulgarian and Turkish sections. Offshore section will be jointly built by Gazprom and its partners Eni and EDF.

Table 2 provides South Stream technical characteristics by country as presented in the Feasibility Study and Table 3 presents the planned off-take by country according to the South Stream feasibility study.

Tab.2: South Stream technical characteristics by country as presented in the Feasibility Study

	Russian GTS expansion	Off-shore part	Bulgaria	Greece	Serbia	Bosnia and Herzegovina	Croatia	Hungary	Slovenia	Italy	Total European on-shore	Total
Total length, including pipelines to – Crotaia -Bosnia and Herzegovina:	2499,6	925,1	537,8	-	411,2 75,6 101,5	-	98,0	229,0	266,0	11,0	1730,1	4229,7
Total capacity, bcma	63,0	63,0	63,0	2,5	40,6	0,5	2,7	32,6	25,9	24,0		63,0
Number of compressor stations	10	-	3	-	2	-	1	1	2	-	9	19
CAPEX, bln. Euro	9,1	10,0	2,9	-	1,5	-	0,1	0,6	1,0	0,03	6,1	25,2
Pressure, MPa		28,3	6,5	7,4	8,1	7,4	7,4	9,0	7,9	5,4		

Tab.3: Planned off-take by country according to the South Stream feasibility study

bcm	Planned supplies through South Stream (including further transit)	Gazprom`s sales in 2010	Consumption in 2010	Share of Russian gas in 2010 (%)	Gazprom`s sales in 2011	Consensus forecats of gas demand
Bulgaria	19,9*	2,3	2,94	78	2,81	5
Greece	2,5	2,1	4,18	50	2,9	6,3 – 6,9
Serbia	4,8	2,1	2,10	100	1,39	2,1
Bosnia and Herzegovina	0,5	0,2	0,52	38	0,28	0,7 – 0,8
Croatia	2,7	1,1	3,20	34	0	3,75 – 4,82
Hungary	6,7	6,9	12,32	56	6,26	12,8 – 14,8
Slovenia	1,9	0,5	0,70	71	0,53	1 – 1,6
Italy	24	13,1	85,99	15	17,08	99,5
TOTAL	**63**	**28,3**			**31,25**	

* Bulgarian off-take figure doesn`t mean that all this gas will be consumed inside the country – it means only that this gas will leave the South Stream in this country and probably go to the other countries (like Turkey, Romania, Macedonia, Albania) through the existing infrastructure.

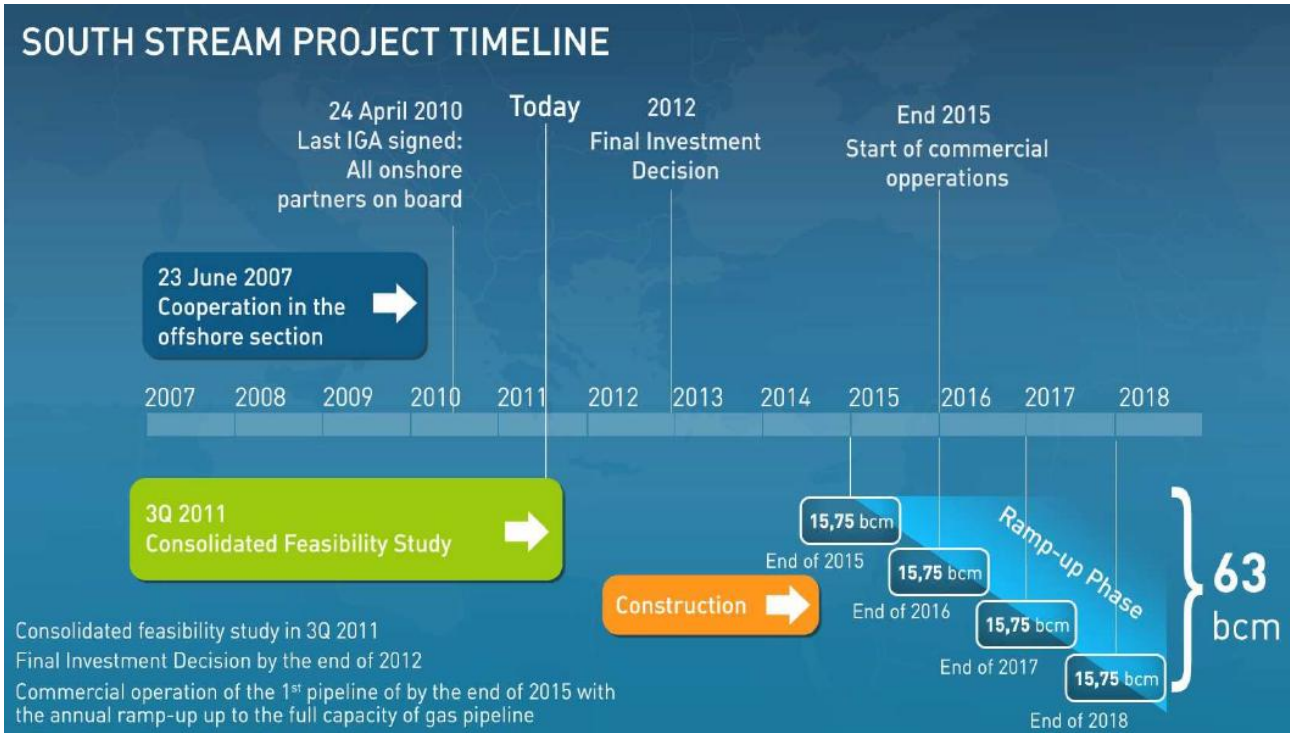
The Russian GTS expansion is called "Southern Corridor" project in Russia. Southern Corridor develops capacities enabling to supply gas into South Stream. The total length of the gas transmission system will account for 2,446 km. The project requires that 10 compressor stations are constructed. The project is divided in two phases:

- Phase 1 (the western part) stipulates that an 834 km gas transmission system from the Pisarevka CS (Voronezh Oblast) to the Russkaya CS (Krasnodar Krai) is constructed. Intended to become the main compressor station of the Southern Corridor's offshore part and the most powerful one in the world, the Russkaya CS with the design capacity of 448 MW will be built in the Anapa District (Krasnodar Krai). An interconnector from the Kubanskaya CS to the Korenovskaya CS will also be constructed within Phase 1. The existing corridor connecting Petrovsk with Pisarevka will be retrofitted. Construction is expected to end by 2015 for synchronization with commissioning schedules of the South Stream gas pipeline's first stage.
- Phase 2 of the project (the eastern part) contemplates constructing a 1,612 km gas transmission system from the Pochinki CS (Nizhny Novgorod Oblast) to the Russkaya CS in the existing corridor: Pochinki – Izobilnoye – Severo-Stavropolskoye UGS facility.

For the first two submarine strings of South Stream, only phase 1 is required. The more expensive phase 2 is required for the submarine strings 2 and 3.

South Stream schedule was recently speeded up: Gazprom signed the final investment decision (FID) in November 2012 and plans to start construction in December/January 2012.

Fig. 14: South Stream schedule



According to the recent statements of Gazprom`s officials, the 1st line of SS will only bring gas to Bulgaria. The lines 2&3 will be constructed simultaneously. And after that, FID on the 4th line will be made.

There is no official information on the timing of FID for SS 2&3&4 so far, but according to the experience of NS and example of SS-1, it should take place at least 2 years before the planned pipeline commissioning. As SS 2&3 are scheduled at 2017, the FID should be in early 2015.

FID for SS-1 was signed by Gazprom and the other South Stream shareholders in November 2012. SS-2&3 will be constructed without any additional gas uptake commitments from the European side. SS-4 Gazprom will need additional new contracts with the Southern European states (at least 10-15 bcm for 15-20 years), or a complete break up with Ukraine (in which case all these capacities would be utilized only for by-passing Ukraine).

Gazprom CEO Aleksei Miller announced on 14th of November 2012 in Amsterdam together with the CEO's of all other South Stream shareholders that the final investment decision for the project had been reached. Moreover, on December 7, 2012 Alexei Miller and

the other CEO's of South Stream Shareholders attended a groundbreaking ceremony near the town of Anapa on Russia's Black Sea coast on December 7, 2012. But many questions remain still open. In fact, Gazprom hasn't yet ordered pipe or organized the lay barge for the pipeline and cannot start laying the offshore section until 2014 at the earliest. Moreover, EU officials say a final route has yet to be submitted to Brussels and likely won't have final approval for at least another year. Marlena Holzner, the spokeswoman for the EU energy commissioner, says this means that a final investment decision on South Stream -- a phase after all designs and studies have been completed and official approvals are in hand -- isn't even in sight. "We have no concrete information that, indeed, the final investment decision on South Stream has been taken already because normally, if you use this term in a general sense, you would have different things established before you can say it's a final investment decision, and one is that you have the route. "To the European Commission, it has never been communicated that there is a final route. That means where South Stream starts, where it ends, and which countries the exact route goes through. That has not been done," she continues. "There is no environmental impact assessment for the whole route. As far as we can see it, we don't regard this as a final investment decision."

Gazprom says South Stream will pass through Turkish waters to Bulgaria, then continue on through Serbia, Hungary, Slovenia, and Italy/Austria to tie in with the distribution network of the multinational Eni in northern Italy. Officials in Brussels say they see South Stream's current status as moving from the "conceptual design and feasibility" stage to the "front-end engineering and design" phase. In the latter phase, EU legislation requires numerous tasks that need approval from regulators in each country along the route and from the European Commission itself.

Russia says it has concluded intergovernmental agreements needed with each EU country involved, but the European Commission hasn't yet seen them all. The deadline for EU states to submit those documents to Brussels is February 16, 2013. The commission then has nine months to assess the agreements and raise its doubts and concerns. A detailed plan for the entire route must be submitted to Brussels, which also must approve environmental and social impact studies by national regulators in each EU country. A "transboundary assessment" is also required, with input from EU states adjacent to the route. All studies require consultations with the public and authorities in each country and could take more than a year

to complete. Moreover, the offshore section of the pipeline entering Bulgaria must undergo an EU environmental-impact study to ensure it complies with environmental directives. Russian-European Chamber of Commerce President Sergei Shuklin confirmed that the December 7 ceremony at Anapa was mostly a ribbon-cutting affair without underwater construction activity. “But it starts," Shuklin said. "Actually, by this action, Russia showed they are serious about this project. They are just going to make it happen. I'm pretty sure.... So they will have the first communications with the European Commission, with the governments of the countries participating in this project. So everything will be concluded according to EU legislation, especially since Russia just became a member of the World Trade Organization."

6. Nord Stream recent developments

In December 2009 the European Commission stated that Nord Stream consortium must allow others third-party access to the capacities of OPAL and NEL pipelines, which connect the Nord Stream to the German grid, overruling a previous exemption (for OPAL) by the German regulatory authorities in 2009 for a 22-year period. NEL never officially received an exemption, but Gazprom was fairly certain that the same would have been granted to the pipeline as well. Owing to a planning dispute, a 40-km NEL section south of Hamburg, in the Winsen (Luhe) and Stelle area, has itself been replaced by another route that is now undergoing the permitting process. This section is expected to be completed next autumn. Once it has been completed, the full transport capacity will be available.

Meanwhile a partial solution comes from using the line between Sülstorf (Mecklenburg-Western Pomerania) and Achim near Bremen in Lower Saxony. This means NEL can operate at about 20%.

The newly founded NEL Gastransport GmbH will take over network operations for the ownership share of the W& G Group (51 %) from 1 November 2012. Gasunie (20%), the Belgian group Fluxys (19 %) and E.ON Ruhrgas AG (10 %) also hold shares in NEL. Opal NEL Transport will act as network operator for Opal and NEL Gastransport will do the same for NEL.

In November 2011 project partners officially inaugurated the first segment of the Nord Stream pipeline.

In February 2012, Germany's E.ON Ruhrgas reported that the 440-km-long natural gas pipeline that has been proposed to link the second pipeline of the Baltic Sea transit pipeline system Nord Stream to the German gas grid will be delayed by around one year due to pending legal disputes with local residents.

In March 2012, Germany's Defence Ministry challenged a permit issued by the Stralsund Mining Department regarding the route of the Nord Stream gas pipeline. The ministry stated that it does not want to stop the operation of the pipeline. However, at the same time, it accused the Stralsund Mining Department of being not entirely mindful of the need to protect the pipe, specifically with regard to the training of the German marine and air forces.

In July 2012 TNK-BP initiated internal discussion between AAR and BP on the possibility to joint Nord Stream project. Gazprom didn`t react. Assuming that BP agreed to sell its share in TNK-BP to Rosneft, there could be further development of this initiative. There are also rumors that Novatek could join the project (and also access to the European market), which could soften the problem of TPA (Third Party Access) exemptions for the on-shore infrastructure in Germany.

According to Gazprom`s latest reports, transportation tariff through NS in the 1Q 2012 was $76 for the whole off-shore distance (or $6.2/1000 m3/100 km). Starting from October 1, 2011, only 8.7 bcm were transported through the 1st line. Pipeline utilization rate (by October 2012) was less than 30%. Once the pipeline will reach full utilization, the tariff would be $27.2 (or $2.22/1000 m3/ 100 km).

Nord stream expansion plans (NS3 and NS4)

In December 2011, the Nord Stream consortium announced beginning work on pre-feasibility studies for the construction of the third and fourth lines of the Nord Stream, which could expand the pipeline's capacity to 110 bcm. On May 11, 2012 the shareholders of Nord Stream AG have asked the company to conduct a feasibility study of possible options to further increase the capacities to transport natural gas from Russia to the EU through the Baltic Sea. On October 8, 2012, while launching the 2nd line, Miller said that the partners agreed on economic efficiency and technical feasibility of two additional pipelines. According to Miller, feasibility study has confirmed that one or two additional lines could be built, from

a financial, environmental and technical perspectives. The project partners assessed several route options for the extra lines. One could be to the UK, said Miller. “We see that our British partners are interested in the project,” he said. Before he mentioned that it could be a pipeline passing through European countries, or a direct pipeline to the UK.

The partners plan to sign a memorandum of understanding to build more lines by the end of January 2013. A new company that will be in charge of further pipeline expansion will be set up by the end of the first quarter of 2013, the Nord Stream statement said. “The shareholders will decide their participation by that time,” it added.

For the Russians to commit (take FID) on NS 3&4, they will need reaction from the European buyers (first of all – German companies), political support from Germany (and probably France) and several new long-term contracts (for at least 15 bcm). There will be also a need for additional infrastructure or infrastructure reinforcement to transport the additional volumes across/into North-Western Europe. Therefore for NS 3&4 new exemptions would be needed and Russians would require these exemptions to proceed.

7. European Commission against Gazprom

On September 5, 2012 European Commission launched a formal probe into Gazprom`s behavior. The EC is investigating whether:

- Gazprom has hindered the free flow of gas across member states;
- Whether it has prevented the diversification of gas supply and
- whether it may have imposed unfair prices on its customers by linking the price of gas to oil prices.

The investigation is a follow-up from the raids of Gazprom's premises in the Czech Republic and Germany in September 2011, and from member states' complaints. The EC said that any of the anticompetitive practices, if established, may constitute a restriction of competition and “lead to higher prices and deterioration of security of supply”. “The investigation covers gas supply at the wholesale level in central and eastern Europe, namely Poland, the Czech Republic, Slovakia, Hungary, Bulgaria, Estonia, Lithuania and Latvia,” EC competition spokesman told. He added the probe had been launched following a complaint from Lithuania as well as evidence the EC obtained during “dawn raids” on the premises of a number of gas

companies in central and eastern Europe a year ago. Companies that are found in breach of EU antitrust rules can be fined up to 10% of annual sales.

The intergovernmental agreement mechanism adopted by the Council in September 2012 marks a growing role for the Commission in gas contract negotiations in an effort to help Central and Eastern European countries improve their bargaining power when negotiating with large suppliers such as Gazprom. Member states will have to inform the EU of all agreements with third countries and will have the possibility to invite the Commission to participate in negotiations as observer. The Commission will also be able to check ex-ante the compatibility of negotiated agreements with the EU legislation. Going forward, the EU is likely to participate in contract negotiations and could require modifications in contracts (duration, volumes, pricing).

In the context of these ongoing disputes, the anti-trust investigation adds further tension to the EU-Gazprom relationship. Lithuania's complaints about high gas prices in 2011 and Vilnius's difficulties in implementing the Third Energy Package because of Gazprom's carrot-and-stick approach to safeguard its market share were among the main drivers behind the launch of the investigation. While the Baltic States market represent less than 5% of Gazprom's gas sales into the EU, the probe shows the EU's determination in sticking to its 2015 deadline for full implementation of the Third Energy Package. In those countries, involved in the investigation, the implementation of Third Energy Package means wresting control for the pipelines away from Gazprom and force Gazprom to divest downstream assets.

Gazprom's control of the gas market is amplified by its ownership of equity stakes in Eastern European gas companies that often own transportation assets, making unbundling a thorny task. For instance, Gazprom is present in Bulgaria through a wholly-owned branch, Topenergo, a gas trading and transportation company and through a 50% stake in Overgas, the largest private gas retailer and transporter in Bulgaria. Similar subsidiaries operate in the Czech Republic (Gas-Invest, Vemex), Estonia (Esti Gaas), Hungary (Panrusgaz), Latvia (Latvijas Gaze), Lithuania (Lietvos Dujos) Pland (EuRoPol Gaz) and Slovakia (Slovrusgaz). The completion of the investigation is expected to take anywhere from six months to 18 months. The outcome will likely include mixed results, but on balance the Commission will be cautious in its judgment. The consequences are likely to be differentiated depending on the

extent to which the proved anti-competitive practices hurt each country. Then, if Gazprom does not like the outcome, there is the option to appeal to the European Court of Justice- adding maybe another 12-18 months before a decision.

Critically, the political overtone of the investigation makes it unlikely that the EU will impose fines. Earlier EU probes have condemned ENI, GDF SUEZ, and E.ON for violating EU competition rules and forced them to pay fines up to 10% of their annual revenues. But in Gazprom's case, fines would risk hurting ties with Russia, since Moscow would likely balk at accepting the penalties.

Another risk for Gazprom is that Central and Eastern European countries launch parallel investigations against Gazprom through their national antitrust authorities or via international arbitration courts. This could considerably broaden the scope of the inquiry and the magnitude of the company's liability. Lithuania in September 2012 filed an international lawsuit against Gazprom at the Stockholm arbitration court seeking 1.44 billion euros ($1.87 billion) in damages due to Gazprom's market behavior. The Lithuanian government is willing to risk political relations with Russia-already very deteriorated- because it pays some of highest gas prices in Europe. While Gazprom cut gas prices last year to Latvia and Estonia, by around 15% from the price originally agreed for 2011, it refused to grant a similar cut to Lithuania which chose the hardline against Gazprom. Lithuania seeks to get compensation for the past periods of high prices.

In reaction to the EU investigation, Russia published a decree in September requiring government permission for various actions by companies operating in "strategic sectors," which was aimed at giving Gazprom legal cover in response to the EU investigation while also formalizing Kremlin oversight of the company. According to this decree, these strategic companies cannot change contract conditions or their structure without preliminary approval from the Government. Putin's decree in part seeks to control the pricing renegotiation process in long-term contracts.

Russia's behaviour in Central and Eastern Europe is unlikely to change and will continue to operate in the way that will be the most economically and politically favorable for itself. In October 2012 Vladimir Putin said that Russia is not going to follow the EU requirement on

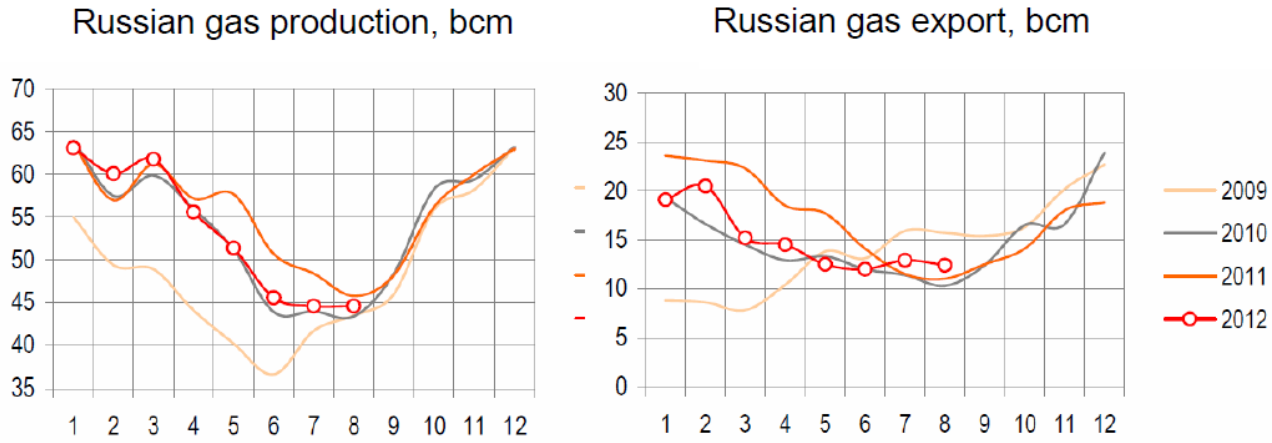
unbundling. In September 2012 Putin and Miller said that Asian markets are becoming the focus of the Russian gas export strategy. According to Miller, "in few years Russia will export to Asia the same volumes as to Europe". This is obviously not realistic!

8. Recent Russian gas developments including LNG projects, Gazprom and potential new Russian competitors (Novatek and Rosneft)

Gazprom settled a price dispute with E.ON in July 2012 providing a 10% price discount. E.ON contract revision has been in line with Wingas, i.e. there is no change in a) pricing structure, b) contract volumes, and c) spot element in the contract. E.ON reports to save 1 bln. Euro on this revision. Gazprom paid in 2012 a total of $2.4 billion in retroactive gas price adjustments to many of its biggest customers, to bring long term gas prices into closer alignment with spot markets in Europe. Gazprom is yet to settle with the Czech arm of Germany's RWE, and Polish state PGNiG, which is not satisfied by proposal to reduce price by 10% and is trying to obtain 20% discount.

In the first 9 months of 2012 Gazprom's exports to Europe reduced by 8.3%, production – by 5.7% (while other producers were increasing their volumes). All major markets are reducing their import (Germany, Italy, France). Only Turkish supplies increased by 9.6%, as Gazprom signed 4 new contracts with the independent private Turkish companies. These contracts are in fact replacing one contract with Botas, which expired in 2011 and was not renewed. In September 2012 Gazprom Marketing and Trading signed a deal with Centrica Plc. for supply of 2.4 bcm during 3 years starting from 2014 to NBP. No other new contracts at oil indexed price are under discussion currently. Due to higher prices, Gazprom's revenues declined just slightly.

Fig.15: Russian gas production and export dynamics



In September Gazprom's Board approved nearly two-fold increase in the company's Investment programme-2012 (from 776 bln. Roubles up to 1.3 trln. Roubles). This investment is primarily targeted for gas transportation projects (Bovanenkovo-Ukhta; Ukhta-Torjok; Sakhalin-Khabarovsk-Vladivostok pipelines).

Domestic market consumption in the first 9 months of 2012 was 1.5% down compared to 2011 – mainly due to the warm weather.

- *Gazprom and Wingas*

Gazprom plans to buy out the share of BASF in Wingas. It is announced as a part of strategy to remove intermediaries in Europe. This is first of all targeted at Wingas business in marketing and storage. Gazprom is not looking at the transportation assets which are now consolidated in GASCADE Gastransport GmbH. Before that Gazprom bought out the share of ENI in their Italian JV Promgas S.p.a.

- *Production and transportation developments*

Bovanenkovo gas field with the potential capacity of 115 bcm/yr production has been launched in October 2012. In 2012, the fist 143 wells have started. Bovanenkovo-Ukhta pipeline is already working on the "technical regime". At the end of August, Gazprom Senior officials announced that the Shtokman partners had agreed that development costs were too high. Many interpreted this to mean that Shtokman has been abandoned, but the situation is not so clear-cut. The parties are still in talks, and have not definitely axed the development.

There is speculation that Statoil's place in the project could be taken by Shell. Total is proposing to develop the field without the sea platform.

First gas from Shtokman was initially expected on stream in 2013. Then it was delayed until 2016. In June 2011, project developer Shtokman Development submitted a request to postpone development work until 2017-18. Now Gazprom says that the FID can hardly be expected before 2014, so at present, 2020-2022 is seen as the earliest realistic date for first gas.

- *Russian LNG projects*

Gazprom's additional LNG production in eastern Russia could amount to between 10 million and 25 million t/y, depending on the results of the feasibility study for a third train at the Sakhalin-2 project and the LNG plant in Vladivostok. Both studies are to be finalised later this year, with a decision on further steps to be made shortly afterwards.

According to Medvedev, the third liquefaction train at Sakhalin-2 would come on stream almost at the same time as Vladivostok LNG , with both projects scheduled for start-up by 2017 (Gazprom holds a 50% stake in the 10 million t/y Sakhalin-2 LNG project, Shell has 27.5% and Japan's Mitsui and Mitsubishi hold 12.5% and 10% respectively). The engineering study by Sakhalin Energy for the third 5 million t/y train, which is likely to cost $5 billion to $7 billion, is under way.

Gazprom was previously opposed to the expansion, citing the lack of resources. The company preferred to send other gas supplies through the Sakhalin-Khabarovsk-Vladivostok transmission system, which was launched in 2011. But now it seems that the company has changed its position, probably with some encouragement from the government. Moreover, Gazprom is now clearly pursuing development of the Kirinskoye offshore gasfield probably with Sakhalin-2 LNG in mind.

Gazprom is also working on a feasibility study for a 15 million t/y LNG plant near Russia's far eastern city of Vladivostok. The project is based on a deal signed in April 2011 by the Japanese Agency for Natural Resources, trader Itochu and Gazprom. The Russian firm said it could build the plant by 2017. The Japanese consortium will help build the plant, which

could cost up to $12.4 billion. Resources for the project will come from the Chayandinskoye field, in Yakutia. Gazprom says it will make its FID by the end of the year. In September 2012 Russia and Japan signed MOU on Vladivostok LNG plant.

Tab. 4: Russian LNG export projects

Russian LNG projects	Official Start-up	Capacity (mt)	Number of trains	Capex	Markets
Shtokman	Unknown	7.5-15	1-2	$30 bln.	Europe, North America, South-East Asia
Yamal-LNG	2017	15	3	$18-20 bln.	North-East Asia, Europe, North and South America
Vladivostok-LNG	2017-18	15	2	$12,4 bn.(LNG plant only)	North-East Asia
Sakhalin-2 expansion	2017	5	1	$5-7 bn.(LNG plant only)	North-East Asia

- *Newcomers on the Russian gas market scene: Novatek and Rosneft*

Novatek: Starting from 4Q 2012 Novatek will supply with gas EnBW, one of the largest German energy companies operating in the fields of electricity and gas supply. The contract is concluded for 10-years and implies annual gas purchase by EnBW of 1.9 bcm. It is the first Novatek`s contract on the European market. Although the contract volumes are small, this might be the first indicator that export markets are being opened for Novatek, and Novatek might expand its presence in Europe further to about 8-10 bcma of total supplies. Despite the fact that Gazprom retains monopoly for Russian gas export, technically it is not difficult to arrange export by a third party. It could be done on a group level by selling gas in Russia, by a Russian legal entity of the NOVATEK group to Gazprom-Export and then re-purchase by foreign subsidiary of NOVATEK group from Gazprom export in Europe at the cost + export duty + transport + some formal trading margin. Alternatively it could be done through commission agreement with Gazprom or simply buying this gas at the spot market. At the same time NOVATEK managed to get three other large Gazprom`s clients in Russia:

- EON Russia signed a deal for 2013-2027 to buy gas from NOVATEK and Lukoil.
- Magnitogosk metallurgical plant (MMK) signed a contract with NOVATEK for supplies of 50 bcm in 2012-2022.
- Severstеel signed a deal with NOVATEK for 12 bcm supply during 5 years

Yamal-LNG-1: In July 2012, work started on the construction of port facilities to support LNG exports from the plant. The multi-purpose port, situated along Russia's Northern Sea Route (NSR) will be built under a public-private partnership, and will not only benefit Yamal LNG, but will encourage further development of the Yamal peninsula. The Russian government plans to spend about $1.5 billion on port construction between 2012 and 2016. The money will be spent on port construction and access, including a 50km long canal, ice

booms and navigation support facilities. Novatek will also spend $800 million. This is an important step in the project implementation. The port, to be called Sabetta, is due to be fully operational by 2018, according to Novatek, which plans to start production of the first LNG train in 2017. Sabetta, once operational, will export LNG to Asian customers via the NSR – a route that Novatek has already successfully tested with gas condensate shipments. From July to November, Novatek plans to supply LNG from the Yamal Peninsula to Asia through the eastern route, across the Bering Strait. For the remainder of the year, the company is likely to take LNG west to the Atlantic basin. FID for Yamal LNG, which will cost an estimated $18 billion to $20 billion, is likely by the end of 2012. Approval for pre-front end engineering design work and and the project concept has already been granted. While supplying LNG to the Pacific basin via the NSR is still being developed, the main problem Yamal LNG faces is ensuring continuity of supply to Asia. Considering its reliance on the NSR to carry LNG to markets, it may be that Yamal can only provide seasonal supplies – hardly the best option for countries concerned with energy security. Swap deals with the other suppliers may be a way around this problem.

Yamal-LNG-2: The structure of the project also remains unclear. Between 2010 and 2011, Novatek, which owns 51% of the project and an option to purchase the remaining 49% until the middle of 2013, invited a number of firms to become co-investors (Shell, ExxonMobil, ConocoPhillips, Total, EDF, GDF Suez, Mitsui, Mitsubishi, Repsol, ONG C and Qatar Petroleum were all mentioned).

Novatek wants to keep a 51% stake in the project and split the remainder between three or four foreign partners, which will also provide technological and financial support. It plans to select two major oil companies, and one or two second-tier partners. There are several investors expected to finance the project. Should the project's costs be $20 billion, Novatek will invest just over $2 billion, $8 billon will come from project finance mechanisms such as banks, $2 billion will come from cash flow from the first phase of the project and the rest from project partners. So far only Total (wanting a 20% stake) has expressed any interest. Novatek said in June that the Yamal LNG FID doesn't depend on a new partner. Above all, the most important advantage of Yamal LNG is that Novatek has a fantastic deal in place with the government. The company has secured concessions, including tax breaks, lower MET for

natural gas and gas condensate, zero LNG and stable gas condensate export duty, as well as regional, property corporate profit tax breaks.

Novatek and Gazprom: The relationship between Novatek and Gazprom is not clear. In April 2012 the two firms signed a co-operation agreement to look into the possibility of establishing joint ventures to increase LNG production capacity on the Yamal peninsula and to develop fields on the Gydan peninsula. If the Yamal joint venture goes ahead, Gazprom's Tambeyskoye field cluster would provide feedstock to boost LNG output. Gazprom, which owns a 10% stake in Novatek, would have a 75% interest in the Yamal joint venture, should it go ahead. In 2010, Novatek signed an LNG export agreement with Gazprom's export arm, Gazprom Export. Under the deal, Gazprom will export and market the LNG to European and Asian buyers via an offshore subsidiary, Yamal Trade. But given the recent Novatek agreements on the gas supply to Germany, the perspectives of the export monopoly removal look quite realistic (at least for LNG from Yamal). Gazprom will retain formal export rights.

Lukoil: In 2011 Lukoil`s production reached 22 bcm, most of this sold to Gazprom at the wellhead. In June 2012 Lukoil signed cooperation agreement with Enel on gas exploration and production in Russia and overseas (including Caspian and North Africa). The sides are looking at agreement on Lukoil`s gas supply to OGK-5 generating company inside Russia.

Russia's biggest oil producer *Rosneft* expects to boost its production of natural gas to 100 bcm/yr in the long term, up from 26 Bcm in 2012. Gas accounts for 26% of Rosneft's proven reserves but only 15% of its total hydrocarbons output. The new figures indicate an expansion of Rosneft's gas development plans outlined in the company's strategy until 2020 made public in April. Rosneft's then CEO Eduard Khudainatov said the company expected its gas output to rise to 45-55 bcma by the end of the decade. Rosneft has already committed to supplying some 34 bcma under contract for 2013 and 2014. Gas supply contracts for 2015 amounted to 37 bcm. For 2016 and 2017, contracted volumes amount to 72 bcm/yr and 77 bcm/yr, respectively. Rosneft plans to expand its gas marketing through major long-term contracts already signed with Italy's Enel, Finland's Fortum and Germany's E.ON and a joint venture with Russian independent gas producer Itera, which will secure Rosneft access to Itera's regional Russian distribution network. In August, Rosneft acquired a 51% interest in Itera and set up a joint venture with the company. The JV's consolidated proven and likely

(2P) reserves are 372.4 bcm of gas and 15.7 million mt of liquid hydrocarbons. In 2013, Rosneft expects the joint venture to produce about 13 bcm. Rosneft and Eni have joint projects in offshore Russia in the Black and Barents seas within the framework of the strategic cooperation agreement. In June Sechin said Rosneft and Eni had looked into Rosneft's possible entry into Eni's refining assets in Europe and fields in North Africa. In fall 2012. Oil giant BP has agreed to sell its 50% stake in TNK-BP to Russia's Rosneft in return for cash and shares. The UK firm will get $17.1bn cash and a 12.84% stake in Rosneft, enabling BP to continue to share in Russia's vast energy resources. BP has agreed to eventually use some of the cash to buy further Rosneft shares, taking its stake to 19.75%.

9. Conclusions

Already today Russia has a large overcapacity in gas export infrastructure towards Europe. European gas demand is not expected to increase dramatically over the next decades – in fact, after 2030 it is even likely to fall if Europe's decarbonization strategies are somewhat successfully implemented. But thanks to the strongly declining domestic conventional gas production (and the fact that domestic European unconventional gas – where available - is likely to be expensive) gas import requirements will need to grow. A large part of this increase will come from Russia as Russia has the largest supply base, a huge existing and expanding gas transport infrastructure based on pipelines (which cannot be moved elsewhere). Russia is thus the only country capable to increase consistently its gas exports in a short time. Russia is today demand not supply constrained.

Part of the overall increase in European gas imports will also be in the form of LNG, but Europe will need to compete with Far East Asian markets for LNG access. Norway will need to make considerable new discoveries to be able to increase its gas exports to Europe. North African producers – due to organizational problems in the aftermath of the Arab Spring, the strongly growing domestic gas demand and difficulties to increase production timely - will be able to only marginally – if at all – increase its gas output up to the end of the decade. The impressive discoveries in the Eastern Mediterranean will not allow for the foreseeable future exports of any significant gas volumes. West African LNG volumes will be able to target European markets, but there are not important additional volumes in sight. After 2020, the impressive recent discoveries in East Africa (Mozambique and Tanzania) will export LNG

mainly to Asian markets. The Caspian region will export some gas to Europe (starting with Shah Deniz 2 in Azerbaijan) with the Tanap pipeline. But it will not be large volumes (10 bcm maximum reaching the EU) and most probably this gas will go to Southern Italy in order not to compete with South Stream on the Balkans.

The Nabucco project has died because of the market uncertainties: a very large scale pipeline project combined with an hugely uncertain demand outlook, moreover potential supply side competition from South Stream. Also, the project promoters were mainly mid-size companies who have to rely on project finance and bank loans, and the banks ask for guarantees and long term ship or pay contracts which the market today cannot deliver. Tanap, on the other hand, is self-financed, with Azerbaijan drawing on its oil revenues to finance up to 80 percent of Tanap's construction costs (and Turkey 20 percent). Tanap is planned to be scalable, i.e. gradually reaching full operating capacity in step with gas production increases, so as to avoid financial losses from temporary below-capacity use. But while Nabucco was supposed to be a fully open and merchant pipeline, Tanap will be a different pipeline as Azerbaijan builds the pipeline to export its own gas and possibly to avoid competing gas to exit the region towards Europe. This is not in the best interest of Europe, but might well be the price to be paid to get any gas from the Caspian.

Notwithstanding all market uncertainties (and never before has the European gas market outlook been so uncertain) Russia is investing as hard as never before. All large-scale projects are going on despite the crises and unfavorable market conditions: More fields, more projects, more diversified production base.

Gazprom and its European partners just finalized the two Nord Stream pipelines (totalizing 55 bcm annual capacity) and have recently decided on the FID of South Stream, though there are still many regulatory uncertainties to be solved related to the on-stream section in Europe and more particularly in the Balkans. It is not yet sure that all 4 South Stream strings (totalizing 63 bcm annual capacity) will get built, but it is extremely likely that some will get built. These pipelines will strongly decrease the gas flow across Ukraine and therefore reduce the market power of Ukraine in its negotiations with Russia. By eliminating a potential source of conflict, it will also make gas supplies to Europe more secure.

But all these numerous Russian upstream and pipeline projects are very expensive and seem to follow more a soviet supply side decision making approach rather than a market based decision making. Moreover, many experts in Russia today claim that decision making for most of these pipeline projects is mostly driven by the benefits made by construction companies owned by certain oligarchs close to some political decision makers instead of sound economic analysis for the country. Indeed, as long as the oil price remains high and that Russia is able to keep its oil-based gas price indexation, it should be able to afford such a strategy. The break-even oil price, at which Russia's budget balances, has rocketed from just $34 a barrel in 2007 to $117 in 2012. In a recent report, analysts at Citi warn that the break-even price will rise to $150 per barrel if Putin's spending policies are implemented. It is clear that should the international oil price be considerably lower than the break-even price required to balance Russia's budget, Russia could run into serious financial problems with such an inconsiderate strategy of maximizing projects instead of value.

The overinvestment strategy of Russian export capacity towards Europe is potentially good news for Europe, though it is potentially dangerous for Russia. Russia does not believe Europe will be able to implement its decarbonization strategy which calls for an 80-95% reduction of Green House Gas emissions (mainly CO2) by 2050 compared to 1990. Such an ambitious climate target means a drastic reduction of CO2 emissions in all sectors but in particular from the power generation sector with practically zero CO2 emissions from the power sector by 2050. The power generation sector has been the main driver for gas consumption growth in the recent two decades. Overinvestment means potentially lower gas prices, which is good for Europe but potentially catastrophic for Russia which has so far never been able to diversify its economy away from oil and gas exports. A bad situation for Russia is in turn also potentially dangerous for Europe as nobody should be happy when the neighbours house burns.

Russia holds the World largest gas reserves, is the Worlds largest gas exporter, practically exclusively by pipeline, and all pipelines so far go to Europe which is a stagnating market. Therefore, Russia is also looking for new markets (LNG, Asia). LNG – with its more flexible structure compared to pipelines - recently became a state priority with huge tax exemptions and financial support (Yamal LNG by Novatek + foreign partners). These projects are

exempted for export duty, profit tax, mineral extraction tax; moreover, all infrastructure (port, roads, LNG tankers, icebreakers…) is financed by the Government.

A new dynamics is also emerging in Russia's gas market structure with Novatek and Rosneft becoming major gas producers, very well connected politically and thus possibly being able to challenge Gazprom's export monopoly. This might bring more competition and thus more economic efficiency into Russia's gas market and possibly also into Russia's decision making process.

Due to the cycle dynamics of the oil and gas industry with its long investment lead times, market fundamentals will more often than not be detrimental to one side or the other and thus potentially be source of conflict between Europe and Russia. To alleviate this source of conflict, Europe should became less dependent on hydrocarbon imports by implementing its decarbonization strategy, and Russia less dependent on hydrocarbon exports by strongly diversifying its economic structure. Unfortunately, both strategies will take a long time.