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Oil, Gas & Energy Law Intelligence

What is the Future of Russian Gas Strategy for Europe after the Crimea? by A. Konoplyanik with participation of E. Orlova and M. Larionova

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What is the future of Russian gas strategy for Europe after the Crimea?¹

**A.Konoplyanik²,
with participation of E.Orlova³ and M.Larionova⁴**

The adaptation of Russia's European energy strategy to new realities in gas has started already after 2006 and has crystallized since 2009. The unfortunate Russia-Ukraine gas transit crises of Jan'2006 and Jan'2009 were not the only and not the key element, though important of such adaptation. Recent reunification of Crimea with Russia and its possible/perceived economic consequences has just further improved this new strategy, argues the author⁵.

¹ Based on presentations of A.Konoplyanik: "Russia, Ukraine, the EU & the new pipelines in the new post-2009 gas world: a way towards new equilibrium". - Presentation at the Plenary Session of the Energy Transition Conference, University of Eastern Finland, Joensuu, Finland, 03 March 2014; "Russia and the EU in search of new equilibrium within the new post-2009 gas world". - Presentation at the Conference "Europe at the crossroads – Future perspectives for sources of energy supply in Central and Western Europe", Diplomatic Academy of Vienna, Wien, 12 March 2014; "Russia and the EU: in search for new equilibrium in the new post-2009 European gas world?" - Presentation at the Budapest Energy Club meeting, Budapest, Hungary, 27 March 2014; «Россия-Украина-ЕС: современный узел противоречий в газовой сфере и его экономическая подоплека». - Лекция в рамках 7-го модуля программы «МВА Газпром: правление нефтегазовой корпорацией в глобальной среде», Высшая экономическая школа СПбГЭУ. Санкт-Петербург, 23 мая 2014 г. (see: www.konoplyanik.ru).

² Adviser to Director General, Gazprom export LLC, Professor at the Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University, www.konoplyanik.ru

³ PHD Candidate at the Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University

⁴ Master student, 2013-2015 programme, at the Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University

⁵ The views expressed in this article do not necessarily reflect (may/should reflect) and/or coincide (may/should be consistent) with official position of Gazprom Group (incl. Gazprom JSC and/or Gazprom export LLC), its stockholders and/or its/their affiliated legal and/or physical persons, and are within full personal responsibility of this author.

Why new post-2009 gas world within Broader Energy Europe?

Russia and the EU are the interdependent parties of what I call “the Broader Energy Europe”. This includes, in my terminology, both the increasing number of the EU Member States (MS) and many other countries in Eastern Hemisphere which are united with the end-use EU market through fixed, immobile, capital intensive, long-term-to-be-developed and paid-back, cross-border energy infrastructure - pipelines and grids. This means that both the whole geographical Europe, non-dependent political borders, as well as Northern Africa, Western Siberia, Central Asia today are already and for long the parts of the “Broader Energy Europe” (and the gas-rich countries of the Middle East will be also the part of it as well in the future when the anti-Iranian sanctions are ended).

This infrastructure creates necessary technical background for cross-border energy value chains, incl. gas value chains (both in pipeline gas and LNG) as the most capital intensive ones in energy and, moreover, compared to other industries. This means that any changes, including in energy regulation, in any part of this interlinked geographical area have its consequences in the other parts of its gas value chains, so the changes, say, in the EU or in the Ukraine has its unavoidable consequences, through so-called “matrix effect”, for Russia and for the rest of the “Broader Energy Europe”.

In 2009 Broader Energy Europe has waked-up in the new gas world. This was an effect of the *First Law of Dialectics* in international (firstly, in Trans-Atlantic) gas when “quantitative” changes in different gas-related areas (in economics – both on demand and supply side, in regulation and in political sphere) have created the “new quality” of the EU gas market, i.e. its oversupplied character and its new architecture with the new risks, uncertainties and challenges for the market participants⁶.

On the demand side, market niche for gas has narrowed in the EU due to overall economic decline in result of post-2008 economic crisis and improved energy efficiency (intermediate results of long-term EU energy policy and of,

⁶ A.Konoplyanik. “Russian gas in Europe: Why adaptation is inevitable”. - “Energy Strategy Reviews”, March 2012, Volume 1, Issue 1, p. 42-56

inter alia, “20-20-20”programme), on the one hand. On the other hand, intensive gas substitution began to take place in the EU. The primary “victim” was mostly oil-indexed contractual gas from major pipeline suppliers like Russia, Norway, Algeria. This gas began to lose price competition⁷, firstly, with heavily subsidized (despite WTO rules on state subsidies) and “must-run” electricity from EU domestic renewable energy (wind, solar), and, secondly, with coal imported from the US (one of the “domino effects” of the US shale gas revolution⁸).

On the supply side, competition within this narrowed market niche for gas in the EU has increased since 2009, first of all, due to redirection of Qatari LNG within the Atlantic basin from the US (which market was factually closed then for imported LNG in result of economic decline and US shale gas production growth) to the EU (another “domino effect” of US shale gas revolution⁹) prior to unfortunate Fukushima accident in Japan (which moves Qatari LNG from Europe to Japan). Qatari LNG is sort of “garbage gas” which can be sold at much lower price in the EU than imported pipeline gas (discounts in gas price for Qatari LNG to make it competitive can be compensated by marketing of associated liquids at much higher prices of the oil market, providing adequate returns in aggregate for both Qatari products).

At the same time, the radical changes in the institutional sphere of the EU energy took place. In September 2009 Third EU Energy Package came into effect presenting a totally new architecture of the EU gas market – with “entry-exit” market zones and virtual trading point (VTP/hub) in each zone. This was concurrent with EU oversupply situation which triggered further EU gas market liberalization (in the form of continued upside-down gas reforms), since oversupply is always a precondition for effective liberalization.

And, finally, the political dimension of the changes should be mentioned, which means, first and most, the unfortunate Russia-Ukraine gas transit crises

⁷ Т.Митрова, Дж.Стерн, М.Белова. Европейский газовый рынок: мечты не всегда сбываются. Энергетический центр Московской школы управления Сколково, июль 2012.

⁸ А.Конопляник. Американская сланцевая революция: последствия неотвратимы. - «ЭКО», 2014, №5, с. 111-126.

⁹ Ibid.

of Jan'2006 and Jan'2009. They have their consequences for all three parties involved (the EU, Ukraine, Russia) and for the whole Broader Energy Europe.

Russia-Ukraine-EU: 22 days vs. 40-plus years – and “no return” points

As well known, Ukraine is an integral element of Russia-EU gas supply chain since most of Russian gas is being transitting to the EU through Ukraine. So these two unfortunate transit crises have both their “matrix effects” and “domino effects” on Russia-EU gas relations and supply chain. 22 days of interruptions of Russian gas transit supplies to the EU via Ukraine (3 days in Jan'2006 plus 19 days in Jan'2009) has overbalanced previous 40-plus years of stable and non-interruptible supplies to the EU since 1968, when then Soviet gas first came to Western Europe in Baumgarten, Austria. These 22 days has changed *perceptions* within **all three parties** in the cross-border Russia-EU gas supply chain regarding stability and non-interruptible character of future gas supply through this chain. In respond, each of three parties has developed its own vision of and answers to such perceived challenges and has created its own line of actions in respond to them.

New perceptions within each party created different starting points for what can be considered as an following objective “domino effects”: political statements in respond to the events were summarized into political decisions, which were incorporated/converted into corresponding legal documents, which, in turn, pushed forward implied in law investment decisions (some time quite capital intensive) aimed at reaching new *perceived* equilibrium between the parties, as seen by each of them (no trilateral dialogue yet). And when investments are made, this means that ‘no return’ points in new policy actions are passed through.

Natural question arises: such ‘no return’ points for each party - what are they? Whether they are reached or passed through already by each party within the cross-border Russia-Ukraine-EU gas value chain?

First of all, in search for new post-2009 equilibrium, all three parties – the EU, Ukraine, Russia – seems to have different aims, responds and lines of actions, which are:

- for the EU - to diminish dominant role of Russia as major gas supplier,
- for Ukraine - to escape monopoly of Russia as one single gas supplier,
- for Russia - to escape monopoly of Ukraine as one dominant gas transit route.

These aims seems to be totally different, which means the task is to find new equilibrium within (i) multidirectional and individually enforced policy changes, and (ii) narrowing corridor for new equilibrium. This means that all three parties are facing “a long and winding road” (*The Beatles*) to new compromise... if a good will is there ... to be based on common understanding of the issues in question and their underlying economics.

From my view, the common background for all three parties is that they all would like to diversify. But for any of them “diversification” means different substance compared to other two.

EU’s respond: diversification

Post-2009 EU perception is *as if* future supplies from Russia via Ukraine to the EU are no more reliable and *as if* there are ways and means to escape from this dependence. Since Russia is one of three major gas suppliers to the EU, the new EU policy is to diminish dominant role of Russia as key supplier. EU instruments for this are: organization of new internal EU gas market architecture with multiple supplies and high flexibility. Multiple supplies should be achieved by alternatives to Russian gas both on supply and demand side.

On supply side – by instruments predetermined in the Regulation on gas supply security¹⁰ (at least three gas supply sources for each EU MS, so-called ‘N-1 standard’, automatically activated ‘early warning system’ at the EU level,

¹⁰ “Regulation (EU) No 994/2010... of 20 October 2010 concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC”

...), development of LNG, domestic shale gas, underground gas storages (UGS), etc.

On demand side alternatives to (firstly to Russian) gas should be achieved through implementation of EU climate change policy. Decarbonizing of EU energy balance (development of RES, further improvement of energy efficiency) will lead to shrinking gas share in fuel mix. The loser of its market niche in the EU would be a less competitive gas supplier which is perceived to be the most distant, costly in production, non-associated and oil-indexed Russian contractual gas.

High flexibility of internal EU gas market should be achieved by diminishing/eliminating of barriers for cross-border gas flows and enabling of their multidirectional contractual character within the enlarging EU (and the area of the Energy Community Treaty). This aimed to be achieved:

- (a) in the commodities market - by further development of short-term and spot trade, by increasing customer's demand to suppliers for softening provisions of their long-term gas export (supply) contracts (LTGEC) such as 'take-and/or-pay', for incorporation of hub-based pricing into current LTGEC, etc.,
- (b) in the capacities market – by development of interconnectors with obligatory physical reverse flows at each interconnection point (IP), implementation of congestion management rules ("use-it-or-lose-it", 'ship-and/or-pay, etc.), etc.

This means new market organization of the internal EU energy market which was established by adoption in September'2009 of the Third EU Energy Package¹¹ which came in force in March'2011.

It is this set of legal instruments which aims to provide multiple supplies & high flexibility of gas flows within the EU and Energy Community Treaty area (28 EU MS plus 8 countries of South East Europe, plus Ukraine and Moldova) based on

¹¹ The 3rd Energy Package is a set of five legislative texts comprising the following two Directives and three Regulations of 13 July 2009: Directive 2009/73/EC concerning common rules for the internal market in natural gas; Regulation (EC) NO 715/2009 on condition for access on conditions for access to the natural gas transmission networks; Directive 2009/72/EC concerning common rules for the internal market in electricity; Regulation (EC) No 714/2009 on conditions for access to the network for cross-border exchanges in electricity; and Regulation (EC) No 713/2009 establishing an Agency for the Cooperation of Energy Regulators. <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2009:211:SOM:EN:HTML>

new principles of internal market organization. From 1962 till 2009 creation and further development of the EU gas market was based on so-called Groningen-based model of LTGEC, which was also the key element of the Soviet-Russia gas export to the EU since first supplies in 1968. Until nowadays Russian pipeline gas reaches its end-users in the EU mostly through the chain of three consecutive LTGEC (Gazprom sells to major EU wholesale buyers-intermediaries, they resell to major end-users in industry, power generation and/or to distributing companies-retailers, which finally resell to small/medium final consumers)¹². Since 2009 onwards architecture of internal EU gas market is to be based on “entry-exit” zones with VTP (hub) in each zone. After existing Russian LTGEC will expire, some of those only in mid-2030-ies (unless there is a bilateral decision of their parties to move to a new type of contractual relations before expiration date), Russian gas supplies will also be converted to this new contractual structure.

New architecture of EU gas market is still under development which will take a lot of time to prepare and to implement all new regulatory acts supplementary to Third Energy Package, including their passing through the corresponding “learning curves”. Further to three gas-related documents of the Third EU

¹² А.Конопляник. Российский газ для Европы: об эволюции контрактных структур (от долгосрочных контрактов, продаж на границе и оговорок о пунктах конечного назначения – к иным формам контрактных отношений?). – *«Нефть, газ и право»*, 2005, № 3, с. 33-44; № 4, с. 3-12; same author. Russian Gas to Europe: From Long-Term Contracts, On-Border Trade, Destination Clauses and Major Role of Transit to ...? – *“Journal of Energy and Natural Resources Law”*, 2005, vol.23, N 3, p. 282-307; same author. Эволюция ценообразования на газ в континентальной Европе. Часть 1: Гронингенская модель долгосрочного экспортного газового контракта как основа формирования европейской системы газоснабжения. – *«Газовый бизнес»*, январь-февраль 2009, №1, с. 62-69; Часть 2: Контрактная структура поставок и цены. – *«Газовый бизнес»*, март-апрель 2009, №2, с. 78-80; Часть 3: Формулы привязки в рамках долгосрочных контрактов и (или?) конкуренция «газ-газ» на рынке разовых сделок? – *«Газовый бизнес»*, май-июнь 2009, №3, с. 76-82; same author. Gas Transit in Eurasia: transit issues between Russia and the European Union and the role of the Energy Charter. – *“Journal of Energy and Natural Resources Law”*, vol. 27, #3, August 2009, p. 445-486; same author. “Russian gas in Europe: Why adaptation is inevitable”. - *“Energy Strategy Reviews”*, March 2012, Volume 1, Issue 1, p. 42-56, и др.

Energy Package – one Directive¹³ and two Regulations¹⁴ - these “supplementary” documents include non-legally binding EU Gas Target Model (first version developed in 2010-2011¹⁵, but new revised version is already being discussed by ACER) and 12 Framework Guidelines (each of those provides ACER’s “Terms of reference” for ENTSOG to develop a corresponding Network Code) and 12 legally-binding Network Codes (only two – on Capacity Allocation Mechanisms and on Congestion Management Procedures - have been developed yet and implemented as Annexes to Regulation 715/2009)¹⁶.

In sum-total, my conclusion is that “no return” point has been passed by the EU as a whole. But economic realities in different parts of the EU - say, in North-Western (NWE) and Central and Eastern (CEE) Europe - are different for offering flexibility (market choice) for gas market participants due to different level of density of infrastructure. Today’s level of density of gas infrastructure in CEE corresponds to the same level in NWE as of early 1970-ies. So how long will it take and how much will it cost to reach in CEE the level of density of gas infrastructure like in today’s NWE which enabled relatively high liquidity of NWE hubs? So it will not be possible to implement EU legally binding decisions on diversification (which is a technical and economic basis for competition) in synchronized manner through the whole EU. The further to the East within the EU (and, more generally, within the Energy Community Treaty area), the more

¹³ Directive 2009/73/EC ... of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC

¹⁴ Regulation (EC) No 713/2009 ... of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators (ACER); Regulation (EC) No 715/2009 ... of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005

¹⁵ CEER Vision for a European Gas Target Model Conclusions Paper, Ref: C11-GWG-82-03, 1 December 2011,

http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Gas/Tab/C11-GWG-82-03_GTM%20vision_Final.pdf

¹⁶ А.Конопляник. Уменьшить риски и неопределенности Третьего Энергопакета ЕС. – «Нефтегазовая Вертикаль», 2012, №7, с. 79-88; same author. “Russia and the Third EU Energy Package: Regulatory Changes for Internal EU Energy Markets in Gas and Possible Consequences for Suppliers (Including Non-EU Suppliers) and Consumers”. - “*International Energy Law Review*”, 2011, Issue 8, p. 24-40; same author. Европа - больше чем Европа. Третий энергетический пакет ЕС будет иметь последствия и за пределами Евросоюза. – «Нефть России», 2011, № 4, с. 56-61; № 5, с. 60-67; №7, с. 48-51; №8, с. 79-83, и др.

slow will be this movement by objective – technically and economically justified - reasons.

NWE vs CEE: preparedness for diversification differs

The EU regulatory authorities have the aim to attract new market players to the EU gas market based on perception (which I put under concern¹⁷) that the more market players are present at the market, especially short-term traders, the higher would be then the liquidity of the market and the lower the prices for the consumers.

Two approaches do exist on how to increase competition in energy area such as gas which is dependent on fixed immobile capital intensive infrastructure: with and without deficit of gas transportation capacities. On which avenue among those two the decision should be searched for: to attract new market players within existing infrastructure (with its continued deficit) or within existing and incremental and new infrastructure (with the aim not to allow appearance of its deficit)?

It seems that EU state institutions are moving through the first avenue. They try by means of “positive discrimination” to press up within existing infrastructure the current incumbent (historical) suppliers – those who has

¹⁷ Андрей Конопляник: рынок газа в условиях неопределенности. - 03.02.2014, http://pro-gas.ru/news_interview/22.htm; А.А. Конопляник; "European Commission vs. Gazprom: How to Find a Balance (Between Demands for Immediate Competition From the First & Justified Long-Term Economic Considerations from the Latter)" OGEL 5 (2013), www.ogel.org; same author. Газовый рынок Европы: однообразие или многообразие ценообразования? – «Нефтегазовая Вертикаль», 2013, № 15-16, с. 16-24; same author. Газовый рынок в ожидании постреволюционной борьбы. – “Open Economy” (Экспертный портал Высшей Школы Экономики), 12 марта 2013 г., <http://www.opec.ru/1465590.html>; same author. Перспективы развития газового рынка: экспертное мнение. - «Нефть, газ, энергополитика» (Украина), 2012, № 6, с.46-60 (часть 1); 2012, № 8-9, с.66-71 (часть 2); same author. Еврокомиссия против Газпрома. – «Нефтегазовая Вертикаль», 2012, № 19, с. 44-56.

earlier invested in and created this infrastructure. At first, vertically-integrated companies (VIC) were unbundled and owners were separated from users of infrastructure. Then barriers (in the form of new risks and uncertainties, contractual mismatch is the one of the key) began to appear for shippers to sign and implement long term transportation agreements. Simultaneously preferences were created for short term users of this infrastructure in case of competition between those two categories of shippers within the deficit of gas transportation infrastructure. This problem was especially relevant within Central and Eastern Europe – in new EU Members States.

Historically, all gas transportation infrastructure within these states was created during Soviet times under GOSPLAN logic: one market = one pipe (from East to West). Diversification of supplies, and, moreover, its reverse flows, were not anticipated in principle.

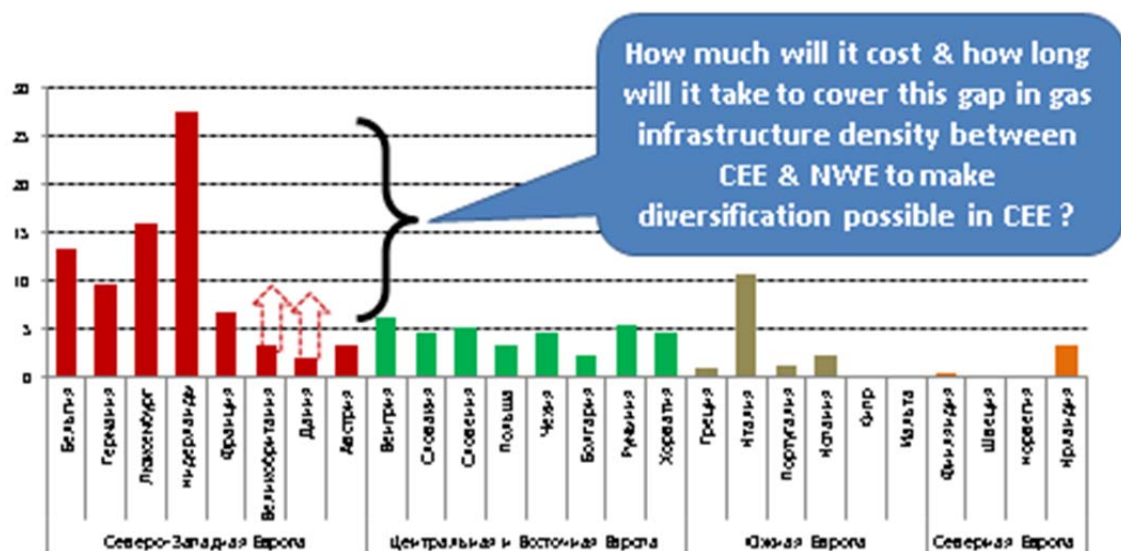
These countries (former COMECON Member States) were from the very beginning dependent on Soviet supplies. This is why today they are practically in full dependence on Gazprom supplies. By joining the EU these countries began to be subjects of the EU legislation on competition, diversification, etc. It might have been possible to start investing in gas infrastructure development in the CEE, to eliminate its deficit so that the new/incremental capacities were developed based on market demand for them. This will enable new suppliers, alternative to Gazprom, to enter CEE market, but such approach requires time and money.

However, EU regulatory authorities see as an entry barrier for newcomers to the EU market not an insufficient density of gas infrastructure at the EU market, but a behaviour of the historical incumbent suppliers present at the EU market (which de fact means: Gazprom). This is why EU regulatory authorities began to tighten their demands regarding the presence of historical shippers (means: Gazprom) at the EU market by the means of “positive discrimination” within existing deficit of infrastructure. In particular, DG COMP of the European Commission has raised the claims to Gazprom (which might result in lawsuits) on non-competitive behavior which discriminates buyers/consumers of Russian gas within CEE.¹⁸

¹⁸ Ibid.

Our preliminary calculations show that density of trunk pipeline gas infrastructure in CEE is about 1.5 times lower than in France, twice lower than in Germany and Italy, three times lower than in Belgium and Luxemburg and more than five times lower than in the Netherlands (Figure 1). This at least makes it more difficult to create preconditions for competition in the CEE states (to increase density of gas transportation infrastructure) to solve the assigned task of diminishing EU dependence on Russian gas.

Figure 1. Gas transportation infrastructure density in the EU* (trunk pipelines only, km/100km²)



*Preliminary results –the comparative order does matter
 Figures for UK & Denmark should be much higher if offshore pipelines are added (to be done at the next step of analysis)
 Calculations made by E.Orlova, PHD postgraduate student, Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG
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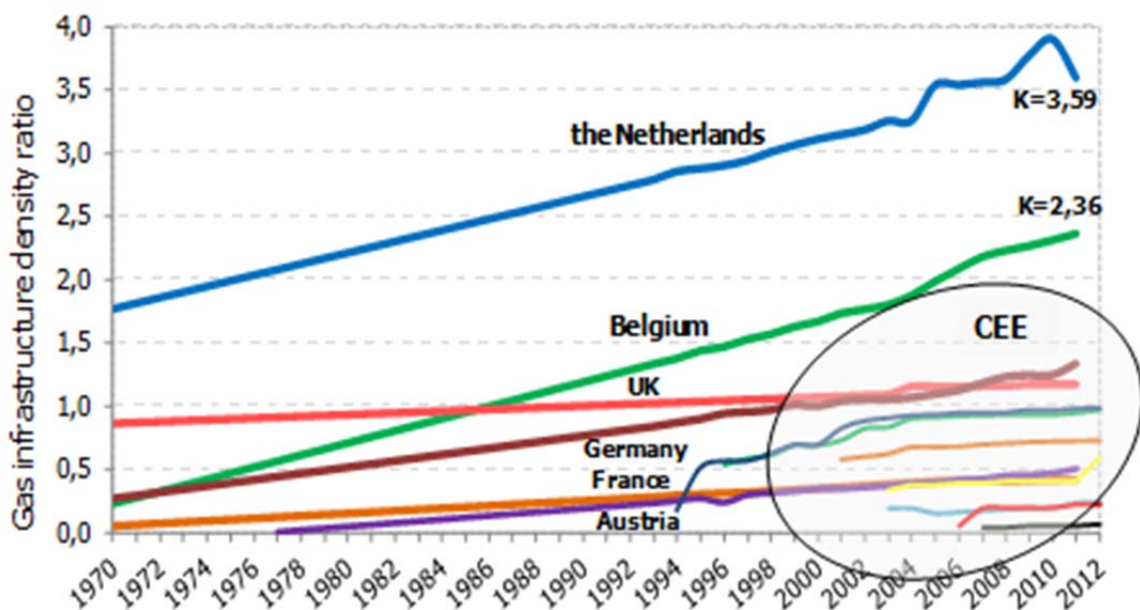
(Figure 1: Gas transportation infrastructure density in the EU (trunk pipelines only, km/100km²))*

Natural questions arises: how much will it cost and how long will it take to diminish the gap in infrastructure density between CEE and NWE in order to make effective diversification in CEE possible (without “positive discrimination” of key suppliers)? We decided to try to answer this question by, firstly, calculating the time gaps between current levels of infrastructure density ratios in CEE states and the time in the historical past (our calculations showed

that it was a remote historical past) when such levels of this ratio correspond to NWE states. In other words, by this calculation we have tried to answer the question: how long have it taken for NWE states to reach their current level of infrastructure density from their historical levels adequate to the current level of infrastructure density in CEE states.

Calculations showed (Figure 2) that all CEE states are placed in the bottom zone of the spectrum of infrastructure density ratios among the EU Member States. The gap is especially noticeable with the NWE states which markets are most liquid within today's Europe: Germany, the UK, Belgium, the Netherlands.

Figure 2. NWE and CEE gas infrastructure density ratio by country (km/km²)



Calculations made by E.Orlova, PHD postgraduate student, Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG

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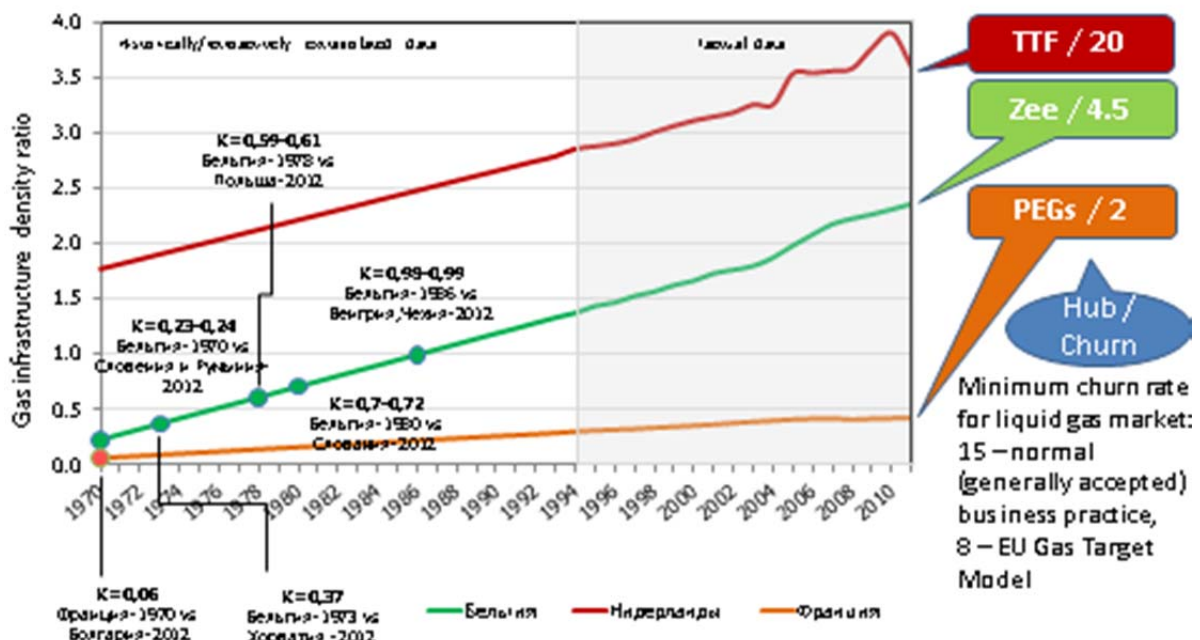
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(Figure 2. NWE and CEE gas infrastructure density ratio by country (km/km²))

This gap is measured by decades (all further figures for CEE countries refer to 2012): level of development of gas infrastructure in Bulgaria corresponds to its level in France in 1970, in Slovenia and Romania – to Belgium in 1970, in Croatia – to Belgium in 1973, in Poland – to Belgium in 1978, in Slovakia – to

Belgium in 1980, in Hungary and Czech Republic – to Belgium in 1986. But none of the CEE states has reached the level of gas infrastructure density in the Netherlands as of 1970 and has not reached the level of minimum liquidity of the gas market (Figure 3). Most liquid gas hub in NWE is TTF hub in the Netherlands – in October 2013 its churn level (parameter which measures the level of liquidity of the given marketplace and equal to the ratio between its volume of trade and the volume of physical deliveries from this marketplace) was about 20, in Belgium (Zeebrugge) – about 4.5, and average for French PEGs – only 2.

Figure 3. Gas infrastructure* density (km/100 km²), NWE (Belgium, Netherlands, France) vs CEE: time gap measured by decades



* Trunk lines & transmission lines ;
 Calculations made by E.Orlova, PHD postgraduate student, Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University, based on the data for 2011/2012 kindly provided by ENTSOG; Churn rates (July 2013): ICIS Heren European Gas Hub Report October 2013
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(Figure 3: Gas infrastructure density (km/100 km²), NWE (Belgium, Netherlands, France) vs CEE: time gap measured by decades)*

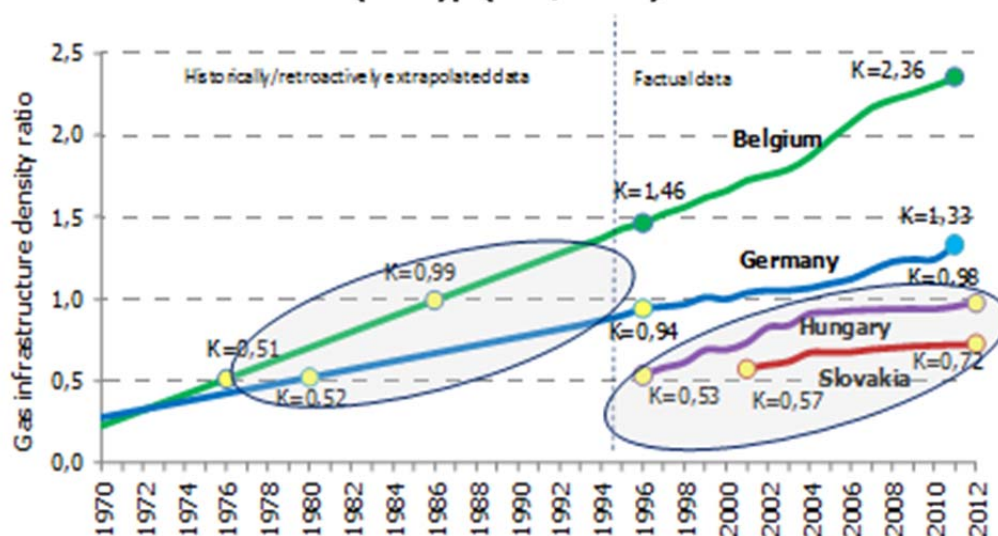
For the record: the second most liquid gas hub within the EU, according to the churn level equal to 15, is the UK market. Other hubs of the Continental Europe have their churn levels lower or much lower than 5, while the minimum churn level to consider the marketplace as liquid was

administratively established in the EU Gas Target Model equal to 8 though according to generally accepted business practice it is considered to be equal to 15. At the same time, the key (marker) US gas Henry Hub showed churn level about 400 already in 2007, and the key petroleum exchanges in New York (NYMEX) and London (ICE) demonstrated then churn levels around 2000. Feel the difference...

Figure 4 shows another angle in comparison of gas infrastructure density: Belgium and Germany (NWE) vs Hungary and Slovakia (countries from the top of the list of CEE states). One can see that growth dynamics of infrastructure density in Hungary and Slovakia is similar to its growth rates in Germany (the slope of the curves is approximately the same). However, this growth happens at different density levels. NWE states can “afford” themselves slower growth rates of infrastructure density since they have already achieved the state of market development adequate to mature market with multiple supplies. But this is not yet the case in CEE states. And this is not because it is the fault of Gazprom, as considered/assumed by DG COMP¹⁹, but because the rates and scale of investments in increase of infrastructure density in CEE states are not enough through all the time of their membership in the EU.

¹⁹ Ibid.

Figure 4. Gas infrastructure density ratio - comparison by country: Belgium & Germany (NWE) vs Hungary & Slovakia (CEE), (km/km²)

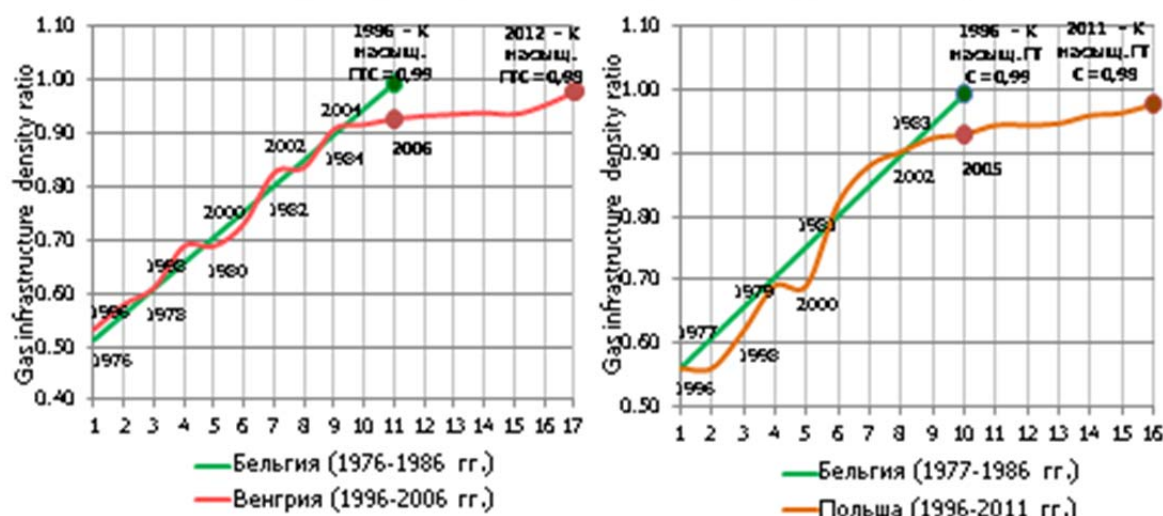


Ovals show the periods when historical ratios of infrastructure density in NWE (Belgium & Germany) correspond to the more recent levels of this ratio in CEE (Hungary & Slovakia).
 Calculations made by E.Orlova, PHD postgraduate student, Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG
 OGEL - A.Konoplyanik, E.Orlova, M.Iarionova

(Figure 4: Gas infrastructure density ratio - comparison by country: Belgium & Germany (NWE) vs Hungary & Slovakia (CEE), (km/km²))

Moreover (which is clear from Figure 4, but more evident from Figure 5), after CEE states (former COMECON members) have joined the EU in 2004, growth of their gas infrastructure density has sharply slowed down. Moreover, one can see sort-of "pair correlation": growth rate and the whole number of claims to Russia/Gazprom have increased simultaneously regarding its use of "gas weapons" in the CEE by the means of as if raising barriers (blocking access to pipelines) for new market participants to enter the CEE gas market. The latter should be understood as de facto requirement for preferential treatment of short-term users of gas infrastructure in their access to the gas transportation system in CEE which has been contracted earlier by long-term transit contracts of the producers/suppliers, firstly by Gazprom, in order to fulfill their long-term supply obligations to the EU customers.

**Figure 5. Gas infrastructure density (km/100 km²):
NWE (Belgium) vs CEE (Hungary, Poland)**



Stagnation of infrastructure density ratio in CEE* after joining the EU? Is it really so? Why so???

*Preliminary results;

Calculations made by E.Orlova, PHD postgraduate student, Chair "International Oil & Gas Business", Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG

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*(Figure 5: Gas infrastructure density (km/100 km²):
NWE (Belgium) vs CEE (Hungary, Poland))*

So, our preliminary calculations results shows stagnation of infrastructure density in the CEE states after their accession to the EU. Whether this is a correct statement? And if so, what is its explanation... Nevertheless, it is evident that without intensive investments aimed at increasing density of infrastructure in the CEE, the task of developing diversified and with high flexibility internal EU gas market cannot be implemented within the whole EU due to long-term underinvestment of infrastructure in the CEE. This was the case in the time of their preparation for entering the EU (when multi-million preparatory programmes for CEE states, including from the EU funds, were aimed at forming the "superstructure" and not the "basis"), and especially in the time after they have finally joined the EU.

This means that vectors of diminishing dependence from Russian gas in the CEE and NWE states will differ both in their angle of slope and in the time of reaching such diminishment. Though I would like to repeat that, from my view, “point of no return” in diminishing dependence on Russian gas in the EU as a whole has been passed across with no possibility/expectations that the movement in this direction might be reversed by the EU.

Ukraine’s respond: diversification

There is still a debate in the media whether Ukraine will finally go towards Euro-integration or CIS-integration. From my view, this “no return” point Ukraine has passed already in 2004 when the then Presidential candidate V.Yuschenko has first requested in May’2004 transition to “European formulas” in the Russia-EU gas trade. This shift started in 2006, first with gas originated from Russia, and was finished in 2009 with the gas originated from Central Asia as well. So, in my view, “Euro-integration” choice has been de facto in place in Ukraine’s energy sector since mid-2000-ies, further strengthened by Ukraine’s accession to the Energy Community Treaty in September’2010.

When since May’2004 Ukraine’s authorities demanded to unbundle supply and transit contracts with Russia and to move to “European formulas” in Russia-Ukraine gas trade, their expectations were to receive higher transit rates (higher revenues) for Russian gas supplies to the EU through Ukraine. But in reality Ukraine has received much higher import prices (higher costs)²⁰.

²⁰ А.Конопляник. Слезаят с иглы. Российско-украинские газовые войны скоро канут в Лету — российский газ на украинском рынке медленно, но неуклонно теряет безальтернативность. - «Эксперт», №38, 24-30 сентября 2012 г., с. 52-54; same author. Эффект формулы (за что сидит Юлия Тимошенко?). — «Нефтегазовая Вертикаль», 2012, № 13-14, с. 18-23; same author. «Газпром», Европа, Украина: о судебных исках, условиях контрактов и формуле ценообразования. Интервью с А.А. Конопляником, доктором экономических наук, профессором РГУ нефти и газа им. И.М. Губкина». — «Нефть, газ и право», 2011, № 5, с. 51-57; same author. Андрей Конопляник: «Газотранспортная система Украины и России всегда была единой». — «Экономические

The move from “cost-plus pricing” (existed before 2006/2009 in Russia-Ukraine gas export) to “European formulas” since then means transition to “net-back replacement values at end-use EU market”, e.g. to petroleum-products-indexed gas pricing formulas within Groningen-type LTGEC.

The moves to “European formulas” with Ukraine took place since 01.01.2006 and 01.01.2009²¹. This means that the “reference periods” for calculating the oil-linked contractual gas price (the initial/starting price - so-called “Po”, which is further updated automatically according to the contractual formula on the quarterly basis until next “price review”) were the previous to these dates three quarters within 2005 and 2008 correspondingly, which were the periods of intensive growth (2005) and historically highest (2008) oil market prices. This has predetermined high level of Russia’s gas export price to Ukraine since 2006/2009 which our Ukrainian colleagues disagree with.

This means that Ukraine’s disagreement with gas import price levels is de facto their disagreement with “European formulas” to which they were aspired and which resulted with transit crises of Jan’2006 and Jan’2009. Moreover, the then Ukraine Prime Minister Y. Timoshenko, who has signed the 2009-2019

Известия, 24 декабря 2008 г., № 234 (997), с.1, 3; same author. Андрей Конопляник: «Единственным вариантом обеспечения предсказуемости и прозрачности ценообразования между «Газпромом» и «Нефтегазом» может быть только формульный подход». – *Экономические Известия*, 24 ноября 2008 г., № 212 (975), с.1, 3, <http://www.economica.com.ua/print/oil/article/164052.html>

²¹ See references under previous footnote, and also: *Putting a Price on ENERGY: International Pricing Mechanisms for Oil and Gas*. – Energy Charter Secretariat, Brussels, 2007, 236 pp., www.encharter.org; А.Конопляник. Российский газ в континентальной Европе и СНГ: эволюция контрактных структур и механизмов ценообразования. - ИМП РАН, Открытый семинар «Экономические проблемы энергетического комплекса», 99-е заседание 25 марта 2009 г. – Москва, Изд-во ИМП РАН, 2010 г., 102 с.; same author. Russian – Ukrainian Gas Dispute: Prices, Pricing and ECT. - *Russian/CIS Energy & Mining Law Journal*, 2006, N1 (Volume IV), p. 15-19; same author. Российско-украинский газовый спор: размышления по итогам Соглашения от 4 января 2006 г. (в свете формирования цен и тарифов, экономической теории и ДЭХ). – *Нефть, газ и право*, 2006, № 3, с. 43-49; № 4, с. 37-47; same author. Эхо ценовой революции. Начавшийся в 1962 г. переход на новую формулу ценообразования на газ «аукнулся» в России во второй половине 2000-х годов. – *Нефть России*, 2010, № 11, с. 66-70.

Russia-Ukraine gas export contract, was later sent to prison during V.Yanukovich Presidency on the sentence as if this contract was anti-Ukrainian in its origin.

Bearing in mind long lasting ongoing economic difficulties in Ukraine, Russia has been presenting a number of unilateral discounts to the market-based contract export price to Ukraine which today all have gone due to different reasons (see Box 1).

BOX 1: Russia-Ukraine gas price discounts story

Immediately in the signed 2009-2019 contract there was a clause introducing one-year long 20% price discount (e.g. for the whole 2009). So instead of market-based $P_0=450\text{USD/mcm}$, Ukraine paid $P_0=360\text{USD/mcm}$ in the 1Q2009, updated in the following quarters accordingly (though in the draft of same contract as of October 2008, if it were signed before year-end, the duration of such discount would have been equal to three years).

In April 2010, in result of so-called “Kharkov Agreements”, a 30% discount (but not exceeding 100USD/mcm) from contractual gas price level till the end of the 2009-2019 contract was introduced in exchange of prolongation of Russian Black Sea Fleet stay in Sevastopol Naval Base post-2017 (when the existing lease agreement was to expire) for another 25 years. The gas price discount was balanced with the counter-obligations for rent payments for the Naval Base in the form of the inter-budgetary offsets. This discount was terminated since April 2014 after Crimea reunified with Russia in March’2014.

In December 2013 Russian has introduced additional price discount to Ukraine equal to 100USD/mcm on a quarterly basis conditioned by regular payments for gas (in addition to 3USD bln loan to Ukraine), bearing in mind huge Ukraine debt for Russian gas supplies (today exceeds 2.2USD bln). Unfortunately, only in Jan’2014 the payments were made in full. In Feb’2014 they were below 50% (still with the previous Government). In March’2014 – already after the coup – gas payments were equal to zero (even at the lowest price level – at 285USD/mcm), monthly debt equal to 525USD mln. This is why since April’2014 this discount was also terminated.

According to the contract, if on 7th of the current month Naftogaz of Ukraine would not have paid for deliveries in the previous month, Gazprom has the right to announce on 16th of the current months the move to the pre-payment scheme in gas deliveries. Bearing in mind Ukraine (Naftogaz) nonpayment for March deliveries, Russia (Gazprom) do possess already the legal right to move to the pre-payment scheme. Nevertheless, during the “direct line” with the country on 17th April, President V.Putin has announced that Russia will not use this legal right for another month thus giving to the current Ukrainian authorities and/or their supporting states in the West the time to find the ways and means to deal with this debt resulted from non-payments for delivered gas.

One of the possible options, from my view, might be the following: it is expected that the first tranche of IMF loan to Ukraine will arrive around end-April. Russia is the creditor of the first order. Naftogaz can at least discuss with Gazprom (best to do this multilaterally – with corresponding Western financial institutions) the terms of restructuring its debt and servicing it in new conditions (it is clear that it will not manage to cover it immediately and in full) instead of presenting ultimatums (like those made recently by the new CEO of Naftogaz A.Kobolev) that as if Naftogaz is ready to pay in full all its accumulated debt (which means that at least some money are available) – but only at the price of gas equal to 268USD/mcm, e.g. established by December’2013 Russia’s unilateral pre-conditioned decision, now terminated.

Ukrainian perceptions of further Russia-related supply risks refer to inability to persuade Russia to diminish contractual import price of gas, e.g. to deviate from “European formulas”, or to provide “price reviews” of these formulas within the contract (the latter option, from my view, will not be possible in principle until Ukraine will have alternative sources of supply; up to that moment all references to the fact that somewhere in NWE gas prices are lower than Russia-Ukraine export prices are economically unjustified since gas with such price cannot be delivered to Ukraine, yet). This resulted in the well-understood motivation of Ukraine to search for multiple supplies aimed to escape monopoly of Russia as one single gas external supplier. Ukraine has both economic and legal motivation to diminish dependence on Russian gas supplies.

High (though market-based) import gas price and Gazprom unwillingness to “soften” its pricing policy stipulates Ukraine (economic motivation) both to search for alternatives to Russian gas on the supply side and to deviate from gas use (means: from Russian gas) on the demand side.

Multiple actions on supply side include intended increase in domestic production – both onshore (on top of annual domestic production around 20BCM) and offshore (though after the reunification of Crimea with Russia and affiliation of peninsula offshore under Russia’s jurisdiction Ukraine’s offshore prospects has significantly diminished, while ExxonMobil puts its Black Sea offshore gas prospect in Crimea waters on hold), exploration for shale gas (Ukraine has signed 10USD bln E&P shale gas deal with Chevron), construction of LNG import terminal near Odessa (10BCMY terminal at 1.3USD bln estimated costs is expected to be on stream by 2018), development of physical reverse gas flows (framework agreement with German RWE was signed for 10 BCM and some small supplies were already announced through IP at Ukraine-Polish border, though need to be proved; other neighbouring countries – Slovakia, Romania, Hungary – are not yet eager to provide physical reverse flows at their IPs unless it is clear who will pay for and/or contract long-term these reverse capacities), invitation to the EU to use Ukraine’s UGS in Western part of the country.

On demand side multiple actions include switching from gas to coal in power generation (6USD bln Chinese loan for this purposes), development of nuclear energy, energy saving and improving energy efficiency (Ukraine has one of the highest GDP energy intensities in the world).

Legal motivation: through its “Euro-integration” policy, materialized in energy with Ukrainian membership in the Energy Community Treaty, this country is obliged to implement within its territory provisions of the EU energy *acquis communautaire* (first such obligation for Energy Community member states referred to the Second, and now – to the Third EU Energy Package)²². So now Ukraine has not only economic motivation, but also a legal obligation for

²² А.Конопляник. Вхождение Украины в Договор об Энергетическом Сообществе ЕС со странами Юго-Восточной Европы: последствия для всех заинтересованных сторон. – «Нефть и газ», сентябрь 2010, №5, с. 20-22, 24, 26, 28, 30, 32, 33-36.

development of alternative supplies, interconnectors, physical reverse flows, etc., and on top of this - to unbundle Naftogas, to implement mandatory third party access (MTPA) to its infrastructure, and, further on, to move to 'entry-exit' system with VTP, etc. This, inter alia, creates new and incremental risks for gas transit via Ukraine (both for Russia as a producer and supplier and for EU as a customer).

Whether “no return” point is already reached by Ukraine? My answer is - “not yet”. But it is clear for me that this is just a matter of time since the trend “away from (monopoly of) Russian gas” will not be changed in Ukraine. Of course, I do not consider seriously statements of some Ukrainian politicians that before 2020 Ukraine will be already self-dependent in gas (I would rather consider such statements as a negotiating tool for approaching renegotiation of 2009-2019 contract) – this business is too much capital-intensive and too much long-term to make such statements with the current state of development of alternative supplies and demand improvements (yet in their infancy), and especially within current political turbulences in Ukraine which do not stipulate any investment activities. But the open question is: whether Ukraine will manage (especially if/when/after political turbulence will hopefully come to its end in the interest of Ukrainian people) to pass final investment decisions (FID) in the above-mentioned projects diminishing Ukraine’s dependence on Russian gas before 2018, when the 2009-2019 contract will approach its expiration date and new gas supply contract should be negotiated? The structure of new gas supply contract, including its pricing components, will strongly dependent on this²³.

Russia’s respond: diversification

In post-2009 European gas world Russia faces both supply and transit risks related to its gas value chain destined for the EU.

²³ This article was written before Russia-Ukraine-EU consultations on Ukraine non-payments, including non-payments for delivered gas, took place in May-June’2014; so these issues are not addressed in this paper since they deserve separate description.

One of major supply risks relate to non-fulfillment by Ukraine of its contractual obligations is lower off-takes, which have, inter alia, negative upstream investment consequences for Russia. To fulfill its supply obligations according to 2009-2019 Russia-Ukraine gas supply contract, Russia was to make advanced investment in upstream to produce adequate amount of gas to be delivered to Ukraine through the whole contractual period (nothing can be done without long-term planning in such capital intensive business as gas – long-term contracts are the investment tools). It is the signed supply contract which predetermines upstream investment. And when upstream CAPEX are made, they are to be paid back by predetermined volumes of revenues resulted from the contractual volumes of the off-takes.

According to contract, in 2013 Naftogaz was to offtake 41.6 BCM (80% TOP from contractual annual 52 BCM), but factually has purchased only 12.9 BCM, according to Deputy CEO Gazprom A.Medvedev. The cumulative value of non-received revenues by Gazprom (to pay-back his upstream investments) only due to lower off-take levels by Naftogaz below contractual TOP levels has reached already \$18.5 billion since 2009.

Another type of risk is the risk related to transit through Ukraine. From my view, one should distinguish between materialized and perceived risks.

Materialized transit risks are those related to consequences of unauthorized off-take of gas in transit (those were proved at least within two episodes – in Jan'2006 and in Jan'2009). But it is Gazprom as supplier of Russian gas who is fully responsible for gas delivery to delivery points within the EU non-dependent e.g. transit problems. So there is the risk of legal claims of wholesale EU companies (Gazprom's customers) against Gazprom as the party to supply contracts with them in case of non-delivery (non-fulfillment of supply contract) even if the reason for non-delivery is violation of transit contract (which fulfillment is responsibility of transit country) by transit state.

Fortunately, EU customers have not raised such claims in Jan'2006 / Jan'2009 cases, but what about the future if violation of Russian transit contracts with Ukraine would be repeated?

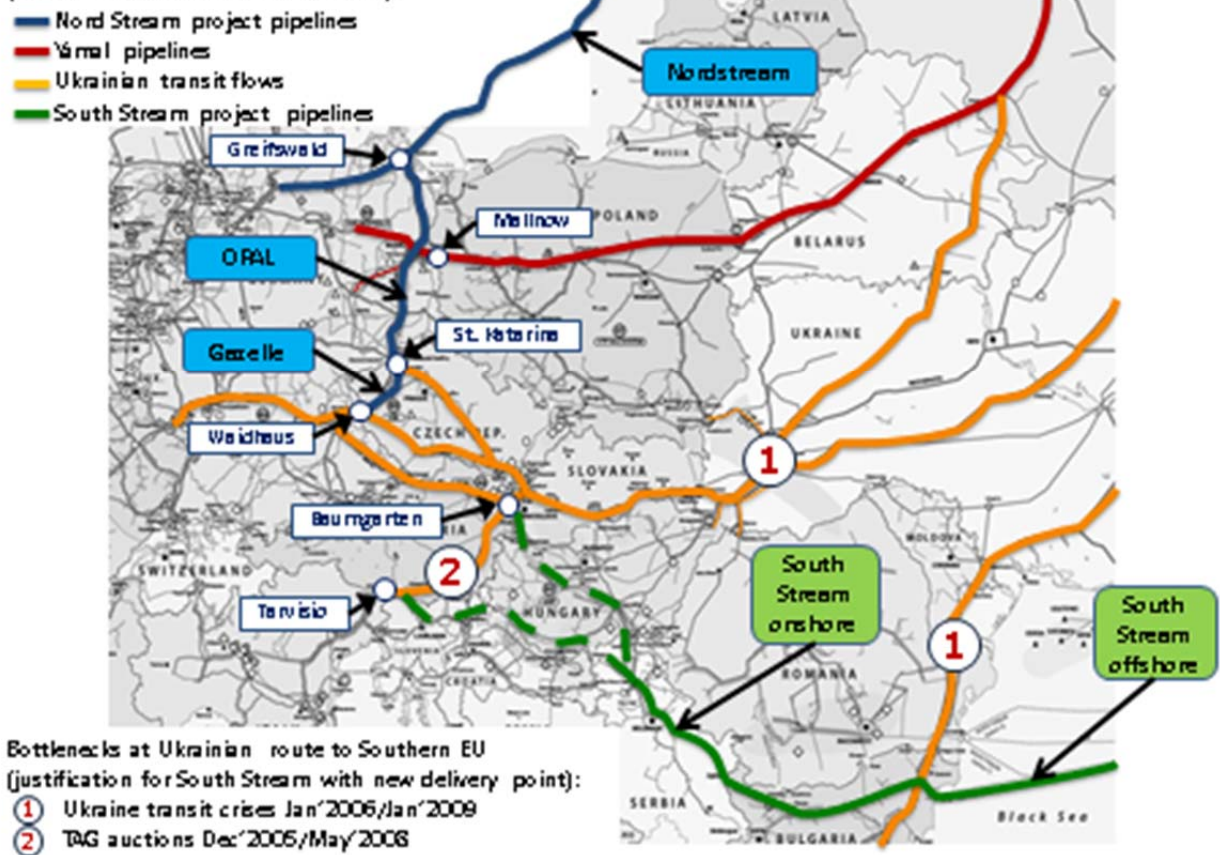
Perceived risks, in my terminology, are those which are to materialize in near future, firstly, in result of Ukraine accession to the Energy Community Treaty

(see above). Obligation to implement MTPA might negatively influence transit flows by creating risk of contractual mismatch. Forthcoming unbundling of Naftogas of Ukraine raises the risk of factual unilateral change of one Contracting Party (up to its full disappearance) to the existing 2009-2019 Russia-Ukraine transit contract which accompanies corresponding supply contract between the parties (though both are separate contracts).

These risks change the whole transportation economics for supplier if precedent-based “transit risk” element is taken into consideration. Russian response to this was to escape monopoly of Ukraine as one dominant transit route, thus to create alternative and non-transit transportation routes to major markets for Russian gas in Europe. Comparative economics of alternative transportation routes compared to existing transit routes has been improving, from my view, with the increasing value of transit risks (we’ll refer to this below).

Historically, all USSR supplies to the EU (since late 1960s) through the domestic USSR territory and through politically and economically controlled territories of the former COMECON states were designed and developed within the centrally planned economy’s management principles, which means “one pipe to each market”. This has predetermined development of “Ukrainian transit corridor” to the EU, which brings Soviet/Russian gas first to Slovakia and then one stream (destined for Southern Europe) went to delivery point Baumgarten at Austrian-Slovak border and then (already as gas belonging to corresponding wholesale EU buyers of Russian gas) further through TAG pipeline to Italy, and another stream (destined for NWE) went from Slovakia to Czech Republic to delivery point Waidhaus at German-Czech border and then (again already as gas belonging to EU buyers) further to Germany, France, etc. (Figure 6).

**Figure 6. UKRAINIAN BYPASSES:
alternative pipelines
(two routes for each market)**



(Figure 6. UKRAINIAN BYPASSES: alternative pipelines (two routes for each market))

With increasing perception of transit risks and with their further materialization for Russia, “no return” points in decisions for building alternative non-transit pipelines to major Russian gas markets within the EU (to NWE and to Southern Europe) were already passed through quite long ago. Though I myself was quite skeptical with initial argumentation trying to justify alternative pipelines based on demand for incremental supplies to the EU in addition to EU-destined supplies from Russia through Ukrainian (and Polish) routes. The picture changes (as was in my case as well) when one considers that alternative routes are not for incremental (additional) supplies from the same source (supplier), but for diversification of supply routes with the aim to minimize/mitigate transit risks to the same destination (delivery points). So Russian supply concept, from my view, has changed from “one market – one

pipe” (with maximum load/utilization ratio of this pipe/route) to “one market – two pipes” (with flexible load ratios of/between the two routes). The second option is more costly in technical costs, but can be less costly if both technical and financing costs are taken into consideration.

In case of NWE market as final destination, Russian alternative “Northern” route includes three elements (which by some people are wrongly considered as separate pipelines, though they are, from my view, just are de facto integral elements of this new single transportation by-pass system): offshore Nordstream and onshore OPAL and Gazelle pipelines, which enable to bring Russian gas to the same delivery point in Baumgarten where it arrives to also through Ukrainian system (Figure 6). All three elements of this new system are already in place, but the whole system cannot operate properly (e.g. at full economically justified capacity to provide the flow of revenues to justify pay-back of its CAPEX) due to 50% restrictions on utilization of OPAL capacity by the EU Commission’s DG COMP (OPAL story deserves separate description).

In case of Southern Europe, Russian alternative “Southern” route includes two elements yet to be built (Figure 6): offshore and onshore sections of the South Stream transportation system (the South Stream story, especially its not yet resolved regulatory issues regarding onshore section in the EU, also deserves separate description). It is interesting to note that if in case of Nordstream/OPAL/Gazelle system its delivery point in Waidhaus is the same as in Ukrainian transit system case for the flows destined for NWE, in case of South Stream system it was at first moved from Baumgarten (the same delivery point as for Ukrainian transit system case for the flows destined for Southern Europe) to Tarvizio and only recently half of the onshore capacity of the South Stream was redirected back to Baumgarten²⁴. My vision of the reasoning for initial movement of delivery point for South Stream from Baumgarten (Austria) to Tarvizio (Italy) is presented in Box 2.

²⁴ <http://www.gazprom.ru/press/news/2014/april/article189898/>

Box 2: TAG auctions – and removal of South Stream delivery point

Removal of delivery point in South Stream case from Baumgarten to Tarvizio at Italian border, from my view, can be justified by additional (to Ukrainian) transit risks in supplies to Southern Europe related to two improperly organized auctions on 6,5BCM incremental capacity of TAG pipeline (major transit pipeline for ex-Russian gas to Italy) in December'2005 (3,2BCM) and May'2008 (3,3BCM).

In Dec'2005 case all 149 qualified bidders from 10 countries for incremental 3,2BCM of TAG capacity were announced the winners when only few of them possessed the gas. Each such winning bidder received 2500 cu.m/hour gas capacity while Gazprom was ready to supply all 3.2BCM. Afterwards a number of these winners came to Gazprom asking either to sell them the gas (with some discount) or to buy from them TAG incremental capacity rights (at slightly higher price, of course).

In May'2008 case 691 qualified bidders from 31 states participated and 29 bidders were announced as winners through the use of – surprise-surprise – lottery (!) mechanism (random sample). A “casino approach” to investment activities...?

One should bear in mind, that EU Commission has promised Gazprom to increase its direct access to Italian market within the trilateral deal “Commission-Gazprom-ENI”, as of October 2003, to balance Gazprom’s contractual losses when it agreed to withdraw provisions on “destination clauses” from its LTGEC with ENI. In compensation he received none in result²⁵. This is why delivery point from South Stream was initially moved from Baumgarten to Tarvizio, in my view. Afterwards, it was returned back to Baumgarten (for half of pipeline capacity) in order to diminish the risk of reopening of supply contracts destined for Baumgarten if delivery point is removed to another place.

Current Russian dilemma, as I see it, in today’s circumstances, is to choose preferential option within this new “one market – two pipes” concept (supply contracts do not predetermine transportation route to the delivery point if delivery point stays the same):

²⁵ See: А.Конопляник. Правовые аспекты процедуры недискриминационного конкурентного доступа к свободным мощностям транспортировки (ДЭХ, TAG и ЕСГ), (с.142-156). - in “Нефтегаз, энергетика и законодательство (выпуск 8 / 2009). Информационно-правовое издание топливно-энергетического комплекса России и стран СНГ (ежегодник)”. – Москва, «Нестор Экономик Паблишерз», 2009, 160 с.

- either to stay within two routes (“new” non-transit by-pass of Ukraine and “old” transit routes through Ukraine) to each major EU markets, which is a “least radical” scenario, since in this case supply volumes are to be distributed within each pair of routes (most probably not on the fixed, but on flexible basis), or
- to stay only with one direct “new” (non-transit) route to each major market, which is a “most radical” scenario, since all former transit volumes in this case will be switched to “new” routes and Ukrainian gas transportation system (GTS) will be dried up.

From my view, different “no return” points exist under different above mentioned scenarios: some are already passed, other – not yet, so there is no clear final picture available yet... at least regarding throughput capacity of the Southern route... But there are more and more economic, financial and legal arguments in favour of developing second alternative corridor (South Stream system) for its full capacity with the aim to use it instead rather than in addition to Ukrainian transit system.

South Stream vs modernization of Ukrainian GTS

It is well-known, that all major oil and gas investment projects are developed by using project financing tools, which means that 60-80% of CAPEX are raised at the international capital market by project sponsors as debt finance. And in project financing world both technical and financing costs does matter... This means that natural advantage of the project in country A over similar project in country B due to lower technical costs can result in final competitive *disadvantage* of the project in country A over the project in country B if risks and uncertainties of project development in country B increase cost of raising capital for this projects at priority rates. So financing costs (including the value of risk of non-pay-back of debt finance) may have higher value/weight within overall costs sometime compared to technical costs. This is, in my view, just the Ukrainian case.

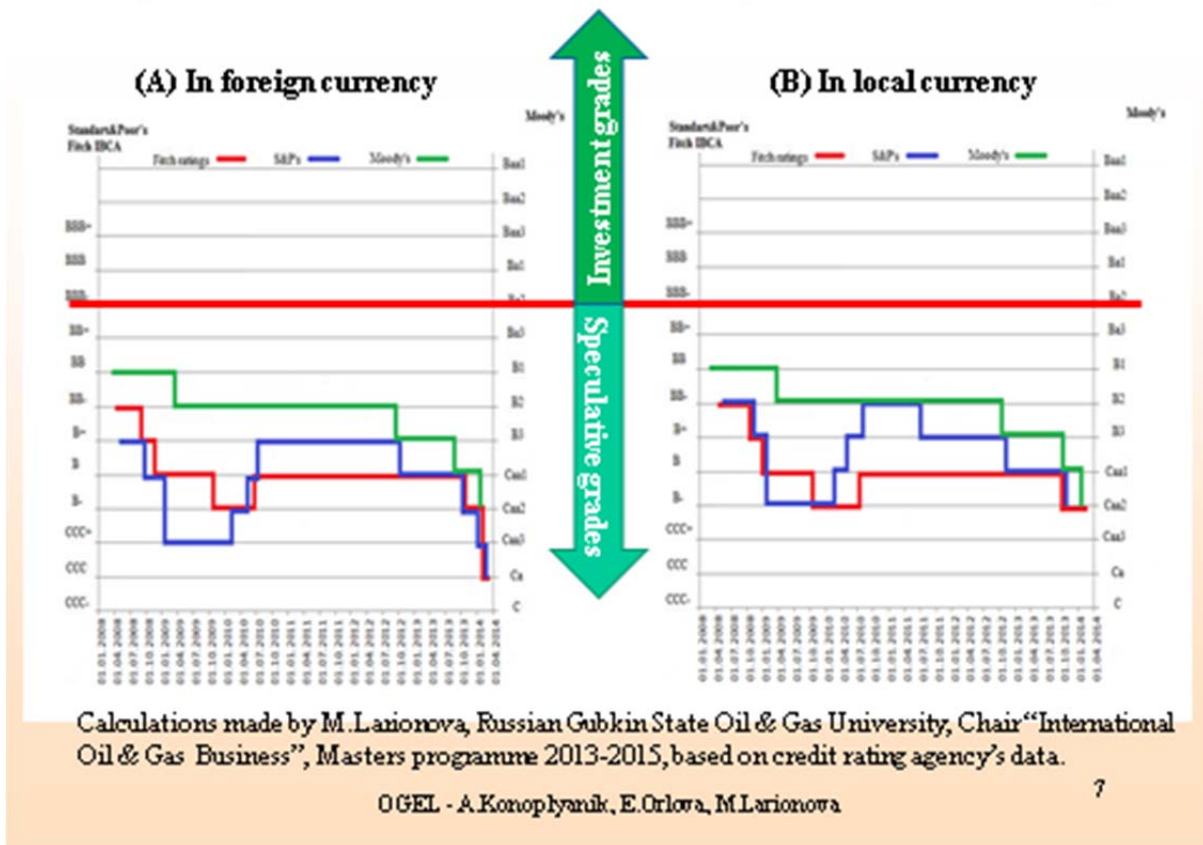
There is the basic rule in project financing that credit rating of the investment project cannot be better than the rating of the company/consortia which develops this project, which in turn cannot be better than the rating of the

host state. So financing costs (if measured in LIBOR-plus values) is a multiple function of the country, the company and the project credit ratings.

Speaking about comparative economics of developing South Stream transportation route (as implementation of the new supply concept) compared to modernization of Ukrainian GTS, one should consider, inter alia, increasing cost of raising capital (the value of LIBOR-plus) and diminishing perspective of CAPEX pay-back invested in modernization of Ukrainian GTS in the current circumstances, which improves comparative economics of the South Stream (there is no space here for detailed technical and economic comparison of both transportation systems).

According to three major international rating agencies (Standard & Poors (S&P), Moody's, Fitch-IBCA), credit rating of Ukraine has been steadily declining within speculative grades zone towards default levels and now stays at CCC/Ca level just one further step from default (Figure 7). At the same time, Russia's rating stays for long at comparatively much higher levels - within low investment grades zone: at Moody's Baa1 since October 2008, at S&P/Fitch-IBCA's BBB since December 2008 and February 2009, correspondingly.

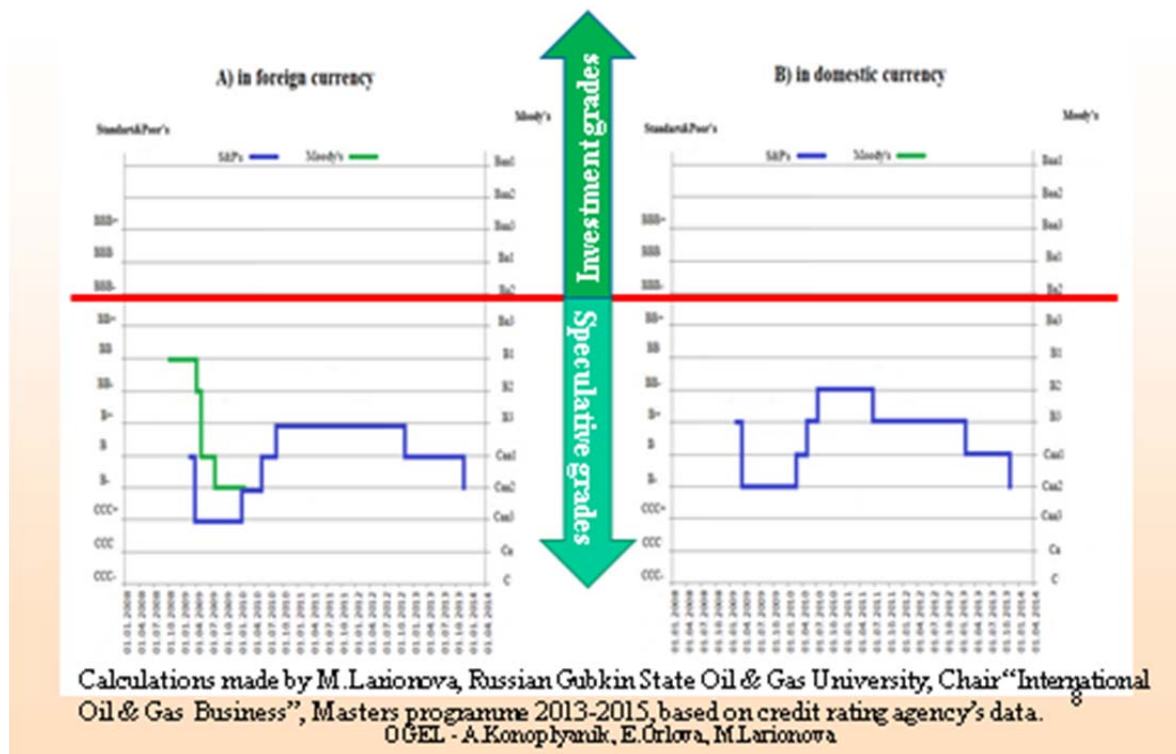
Figure 7. Ukraine: evolution of long-term credit rating



(Figure 7. Ukraine: evolution of long-term credit rating)

Agencies stopped attributing ratings to Naftogaz Ukraine at B-/Caa2 (by Moody's in early 2010 and by S&P in early 2014, correspondingly) (Figure 8). This means that cost of raising capital for modernization of Ukrainian GTS, where Naftogaz or its legal successor (which has not yet any rating at all) – a party to (yet still existing only in theory) multilateral consortia as a special purpose company for such modernization – will be extremely high, if financeable at all under current circumstances. One-year LIBOR has diminished from 4% in early-2008 to 0.5% nowadays. But, according to "Project Finance" magazine, LIBOR-plus in BBB zone (Russia) is higher by up to 6%, while in CCC zone (Ukraine) – by up to 19%.

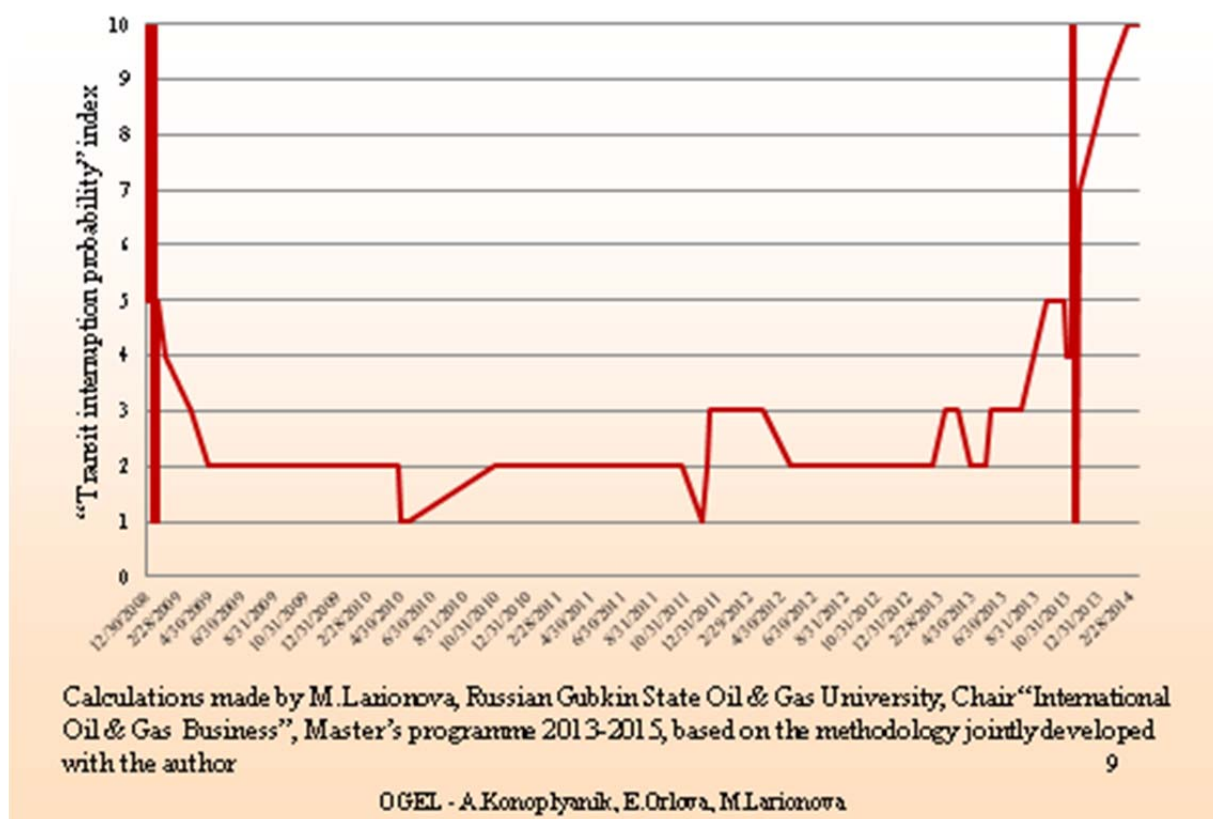
Figure 8. NJSC Naftogaz of Ukraine: evolution of long-term credit rating



(Figure 8. NJSC Naftogaz of Ukraine: evolution of long-term credit rating)

But most important factor in investing in modernization of Ukrainian GTS is risk of its CAPEX non-return due to increasing value of transit risk which will not only additionally increase cost of financing, but can make it non-financeable at all through commercial banking sources. We have calculated with Maria Larionova, my Master-Student in Russian State Gubkin Oil & Gas University, what we called "transit interruption probability" index for Ukraine, based on analysis of events and statements since end-2008 till nowadays which could have influenced transit (Figure 9).

Figure 9. Ukraine: “transit interruption probability” index



(Figure 9: Ukraine: “transit interruption probability” index)

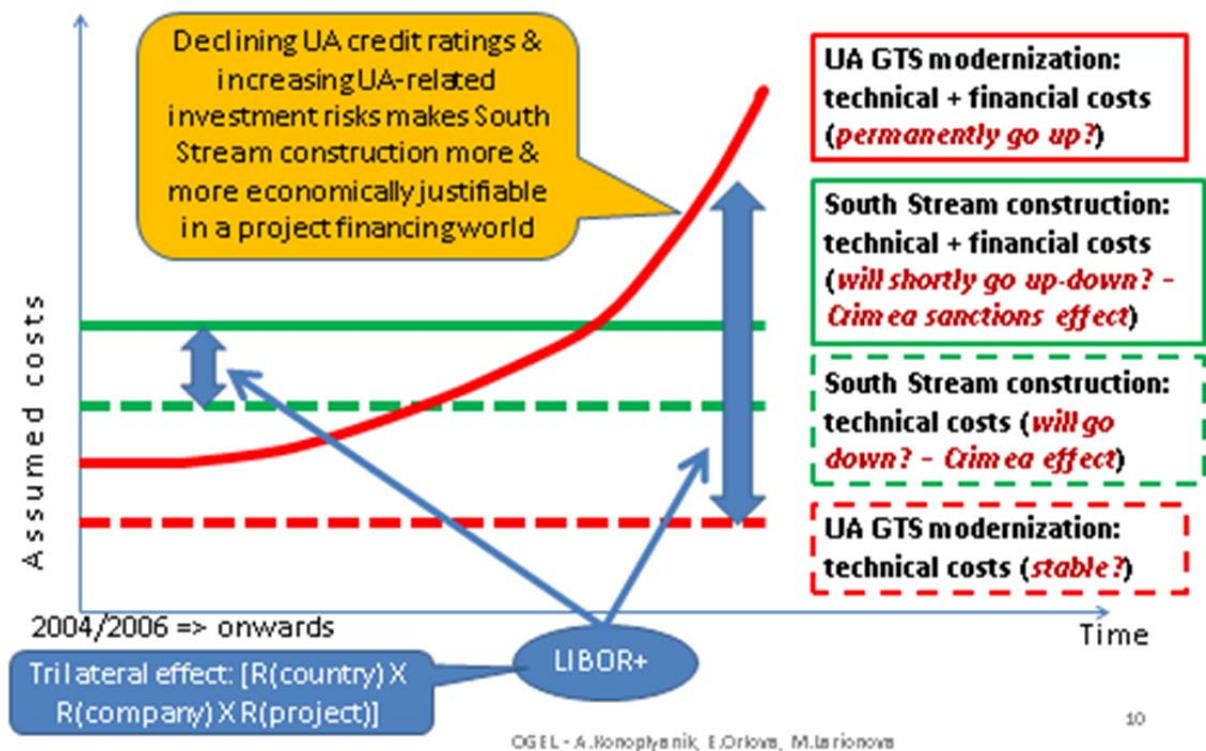
To evaluate possible interruptions of transit supplies we consider 369 newsbreaks, related to gas relations between Russia and Ukraine through 30.12.2008 to 18.03.2014 period. These newsbreaks were taken from the newswire <http://newsukraine.com.ua/>. Then they were filtered to 80 newsbreaks which, in case of their realization, will have a main effect on interruption of gas flows in transit within the Ukrainian territory.

This (or similar perceptions) would be definitely taken into consideration by project financiers if/when the issue of lending money to project sponsors will become reality. In our calculations, index value equal to one corresponds to lowest, and to ten - to highest risk. The curve has clear U-type character. While left rising branch refers to factual interruption of transit in early 2009, right rising branch (the increase in index value since end-2011, with most intensive growth since mid-2013) present the crescent and turbulent political

atmosphere in Ukraine, including most radical proposals from Ukrainian radicals to blow up transit pipelines.

Taking this into consideration, though the gap in technical costs between modernization of Ukrainian GTS and construction of South Stream as new pipeline by-pass system is considered to be in favour of the first, if both technical and financing costs are considered, the gap between the two is either diminished or maybe can even be changed in favour of the second, on top of the fact that it reflect, in my view, the new export concept (Figure 10).

Figure 10. South Stream construction vs Ukraine GTS modernization: illustrative comparison of technical and financing costs dynamics, incl. comparative risks & credit ratings within time frame



(Figure 10: South Stream construction vs Ukraine GTS modernization: illustrative comparison of technical and financing costs dynamics, incl. comparative risks & credit ratings within time frame)

Effect of Crimea reunification with Russia

Post-Crimea effects related to its reunification with Russia can only change the parameters of this concept, but not the concept itself.

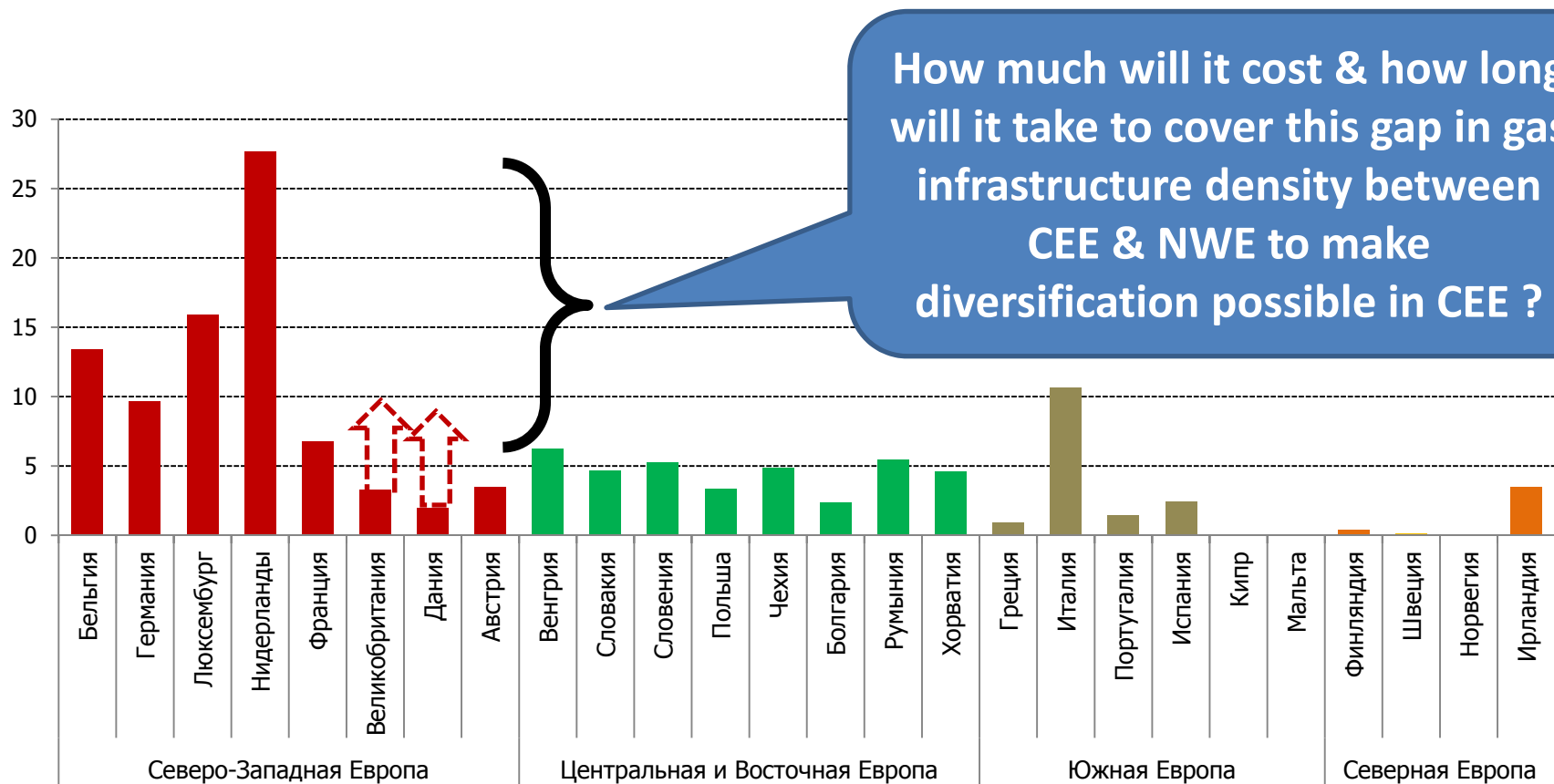
The current economic changes in financial markets as post-Crimea effects might influence (and mostly negatively) both Ukrainian GTS modernization as well as South Stream. Firstly, through the increasing cost of financing in both cases since any configuration of Ukrainian transportation consortia would not have been workable without Russia – the only gas supplier to the EU through Ukraine - at least as a blocking partner. If US/EU sanctions will be upgraded to the third level – the level of “trade war” situation and trade restrictions – this can influence South Stream directly since the pipes for this offshore pipeline are made in Russia from the rolled iron imported from the EU. This means that such sanctions first and most will hurt the EU itself.

In contrary, theoretically, reunification of Crimea with Russia might have had even positive direct economic effect on South Stream. It would have first taken the form of diminishing technical costs due to streamlining of the route through the now Russian Crimea offshore. The route would have become shorter and would have passed through the shallower waters, which would have enabled at least 30-40% saving in technical costs. But, firstly, the no return point in developing offshore part of South Stream has been already passed through (final investment decision taken, construction started). Secondly, international lenders will not provide external financing for the project to be developed in the disputed waters.

So comparative attractiveness of South Stream in the given circumstances will not be diminished by any sanctions and it would be continued to be developed within new Russian concept “one market, two pipes”. The current Ukrainian situation just further improves economic justification of this diversification concept for supplier to mitigate transit risks through Ukraine both for Russia and for the EU. Ukraine might like it or not but this is, in my view, a depoliticized economic, legal and financial realities of the project financing world.

The study was made under the financial support of the Russian Humanitarian Science Foundation within the project № 14-02-00355a "The evolution of pricing on the global energy market: the economic consequences for Russia"

**Figure 1. Gas transportation infrastructure density in the EU*
(trunk pipelines only, km/100km²)**

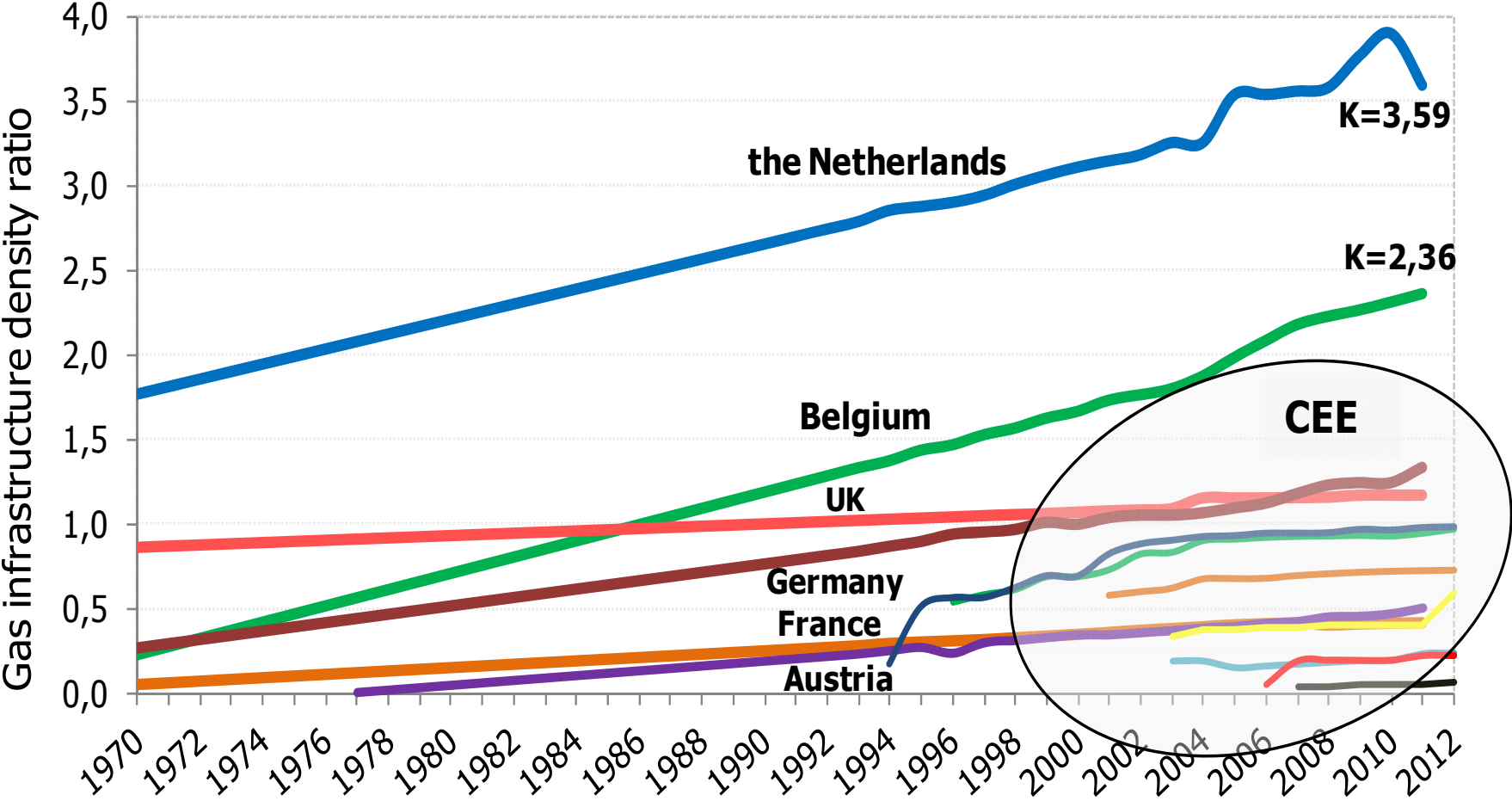


*Preliminary results – the comparative order does matter

Figures for UK & Denmark should be much higher if offshore pipelines are added (to be done at the next step of analysis)

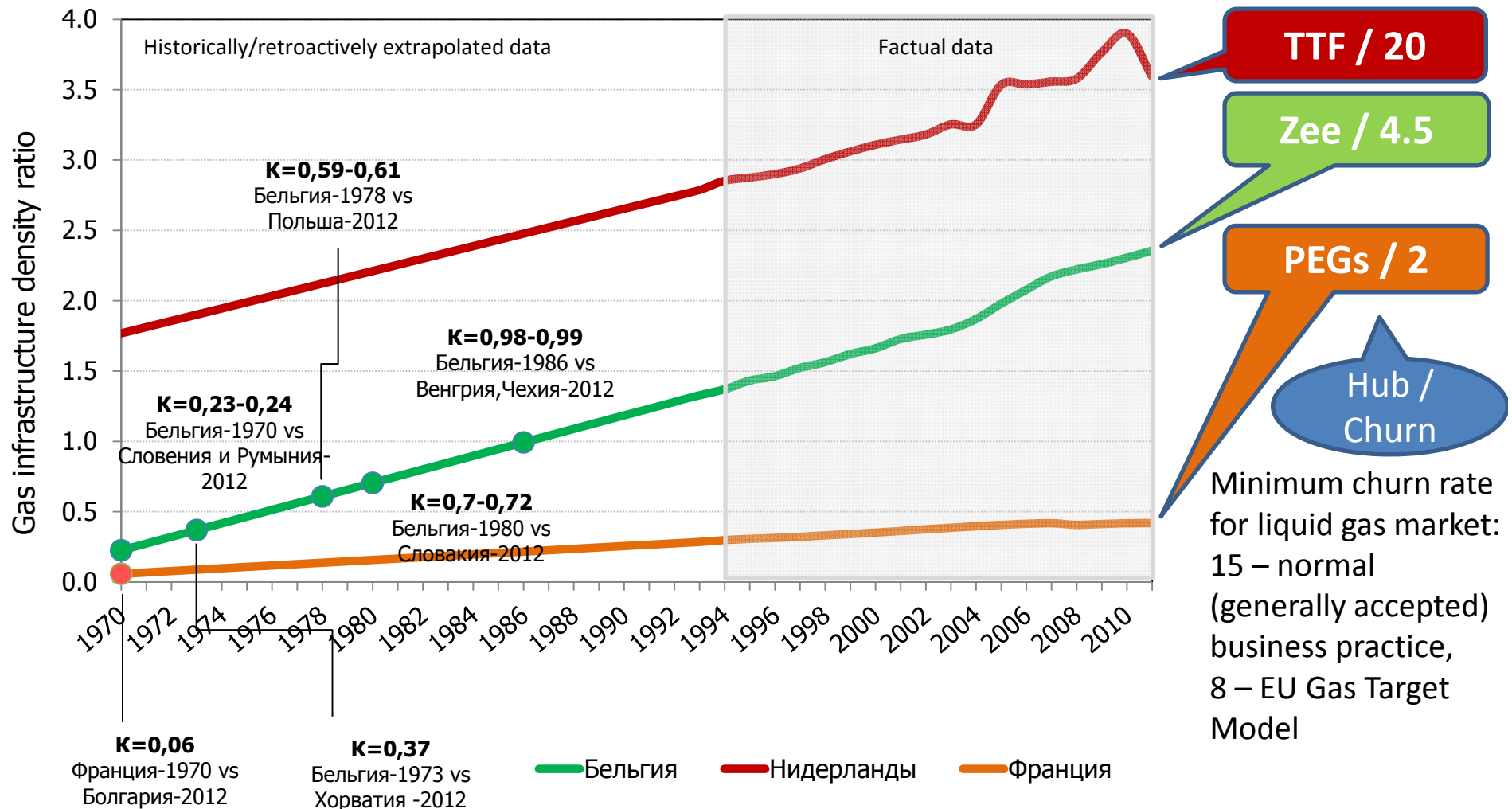
Calculations made by E.Orlova, PHD postgraduate student, Chair “International Oil & Gas Business”, Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG

Figure 2. NWE and CEE gas infrastructure density ratio by country (km/km²)



Calculations made by E.Orlova, PHD postgraduate student, Chair “International Oil & Gas Business”, Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG

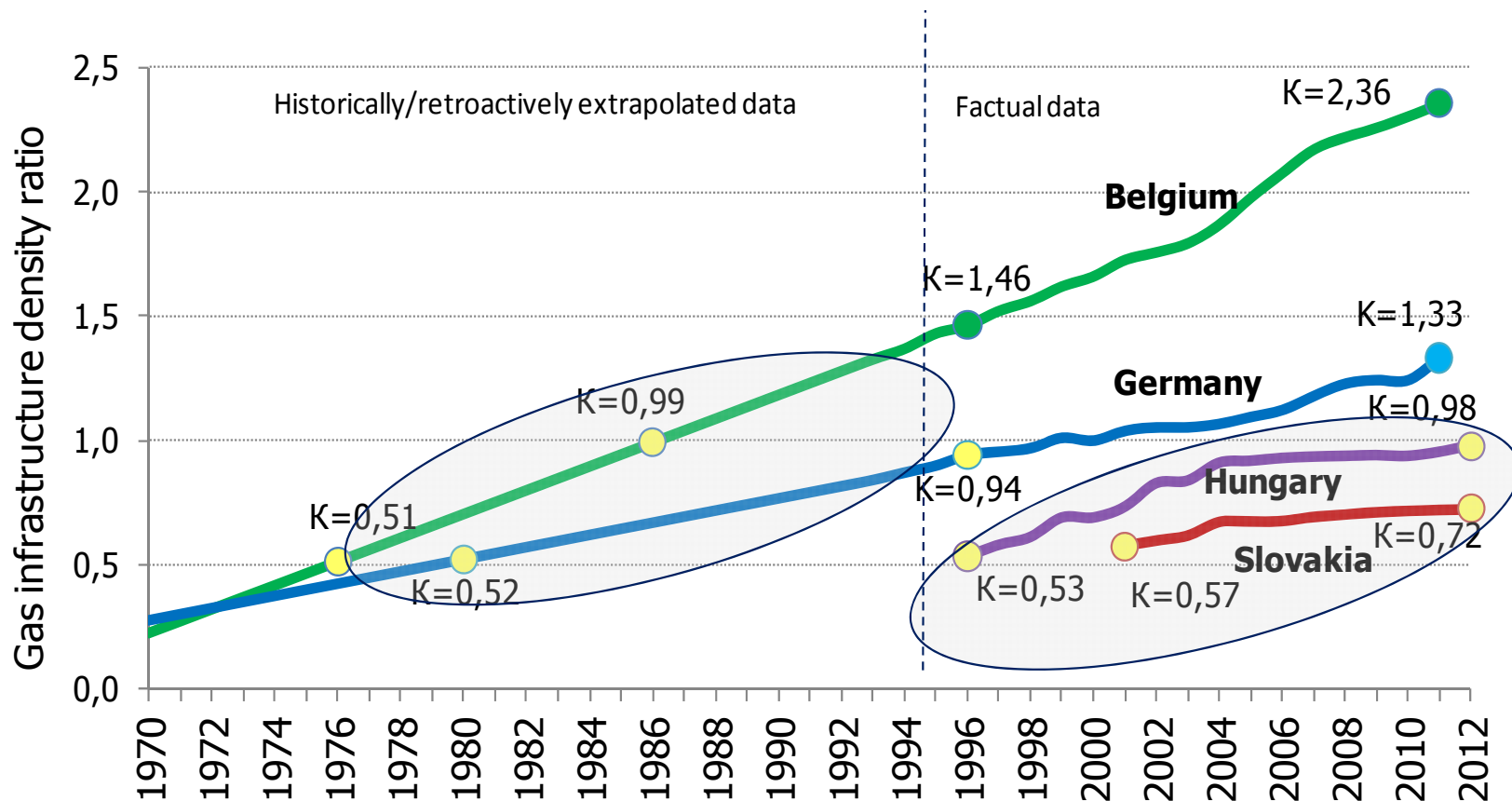
Figure 3. Gas infrastructure* density (km/100 km²), NWE (Belgium, Netherlands, France) vs CEE: time gap measured by decades



* Trunk lines & transmission lines ;

Calculations made by E.Orlova, PHD postgraduate student, Chair “International Oil & Gas Business”, Russian State Gubkin Oil & Gas University, based on the data for 2011/2012 kindly provided by ENTSOG; Churn rates (July’2013): ICIS Heren European Gas Hub Report October 2013

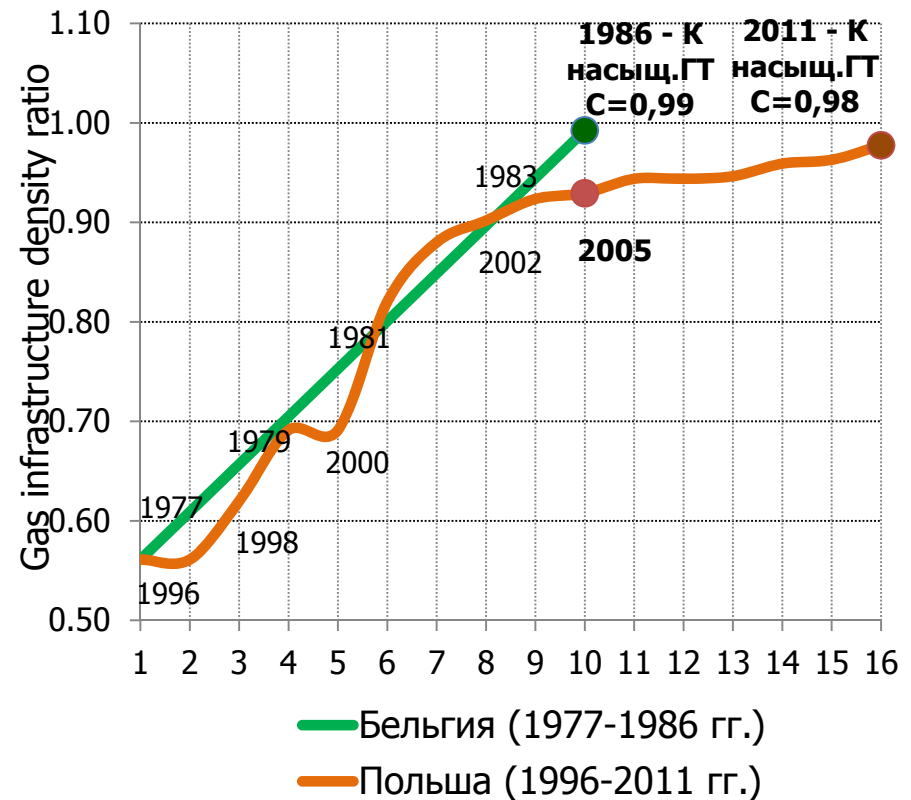
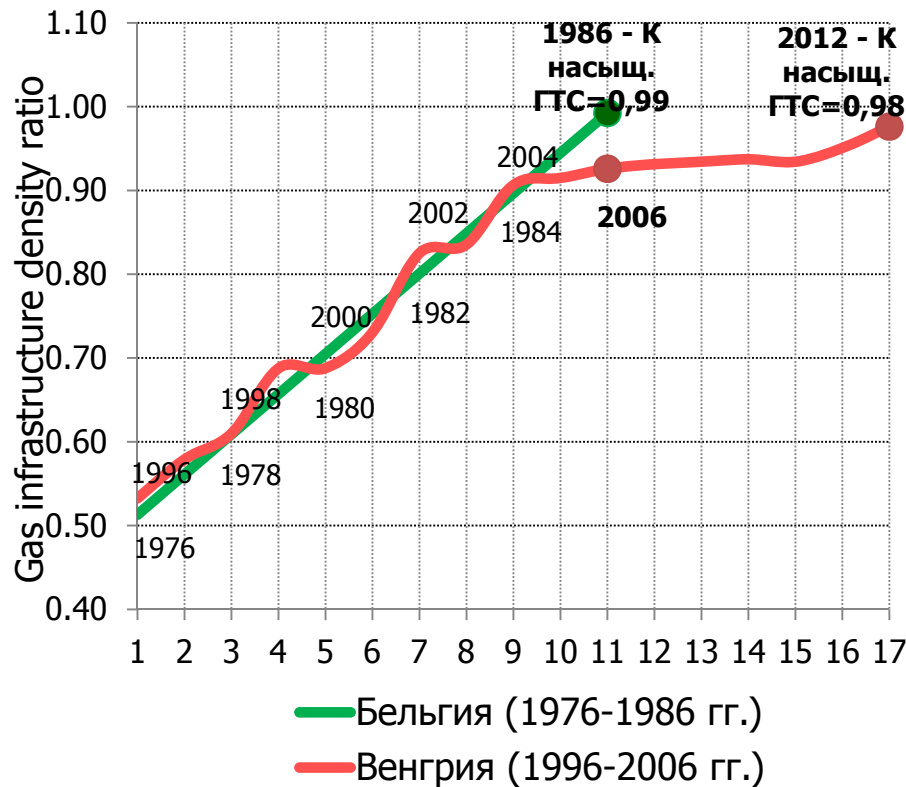
Figure 4. Gas infrastructure density ratio - comparison by country: Belgium & Germany (NWE) vs Hungary & Slovakia (CEE), (km/km²)



Ovals show the periods when historical ratios of infrastructure density in NWE (Belgium & Germany) correspond to the more recent levels of this ration in CEE (Hungary & Slovakia).

Calculations made by E.Orlova, PHD postgraduate student, Chair “International Oil & Gas Business”, Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG

**Figure 5. Gas infrastructure density (km/100 km²):
NWE (Belgium) vs CEE (Hungary, Poland)**



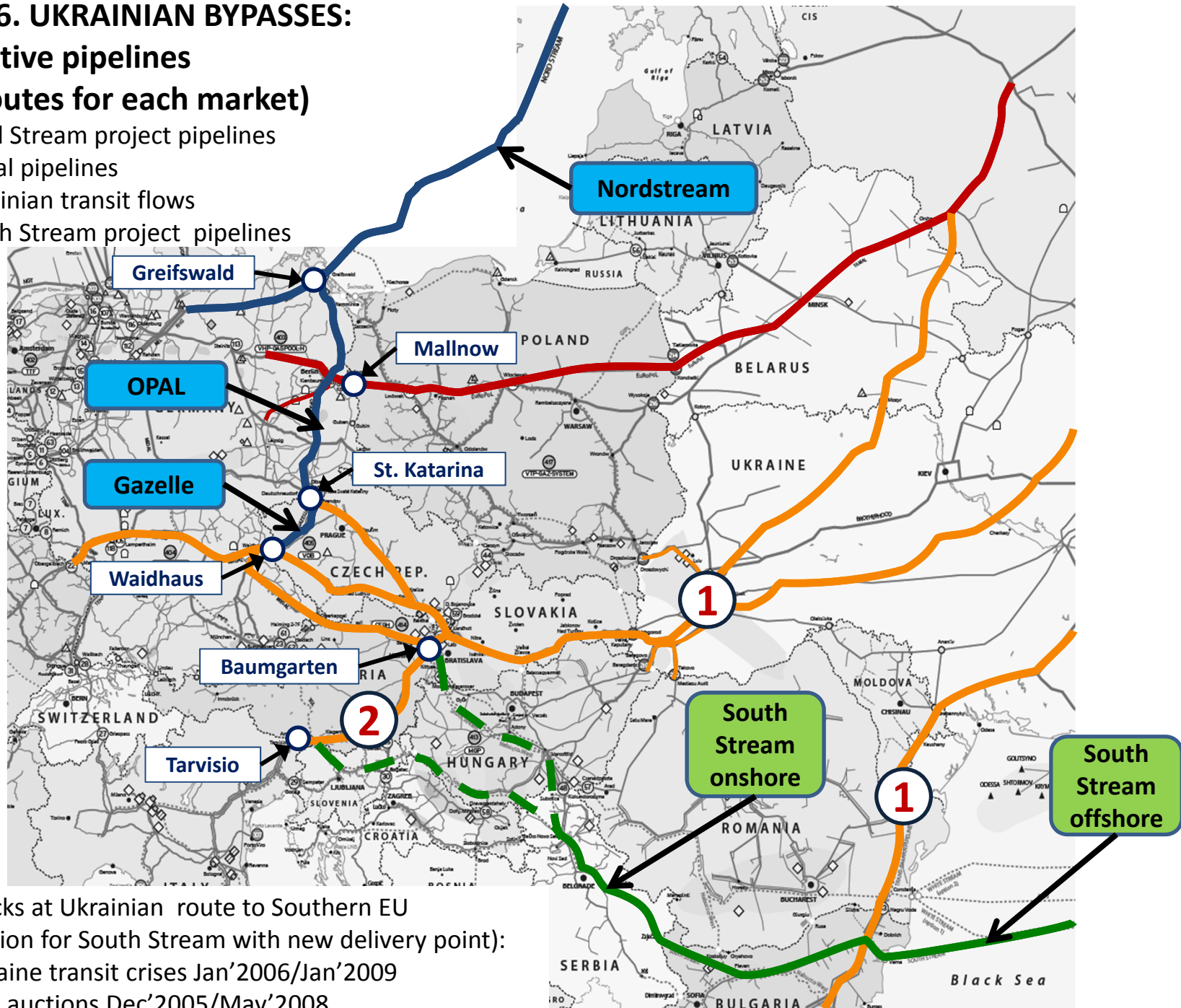
Stagnation of infrastructure density ratio in CEE* after joining the EU? Is it really so? Why so???

*Preliminary results;

Calculations made by E.Orlova, PHD postgraduate student, Chair “International Oil & Gas Business”, Russian State Gubkin Oil & Gas University, based on the data for 2011/2012, kindly provided by ENTSOG

**Figure 6. UKRAINIAN BYPASSES:
alternative pipelines
(two routes for each market)**

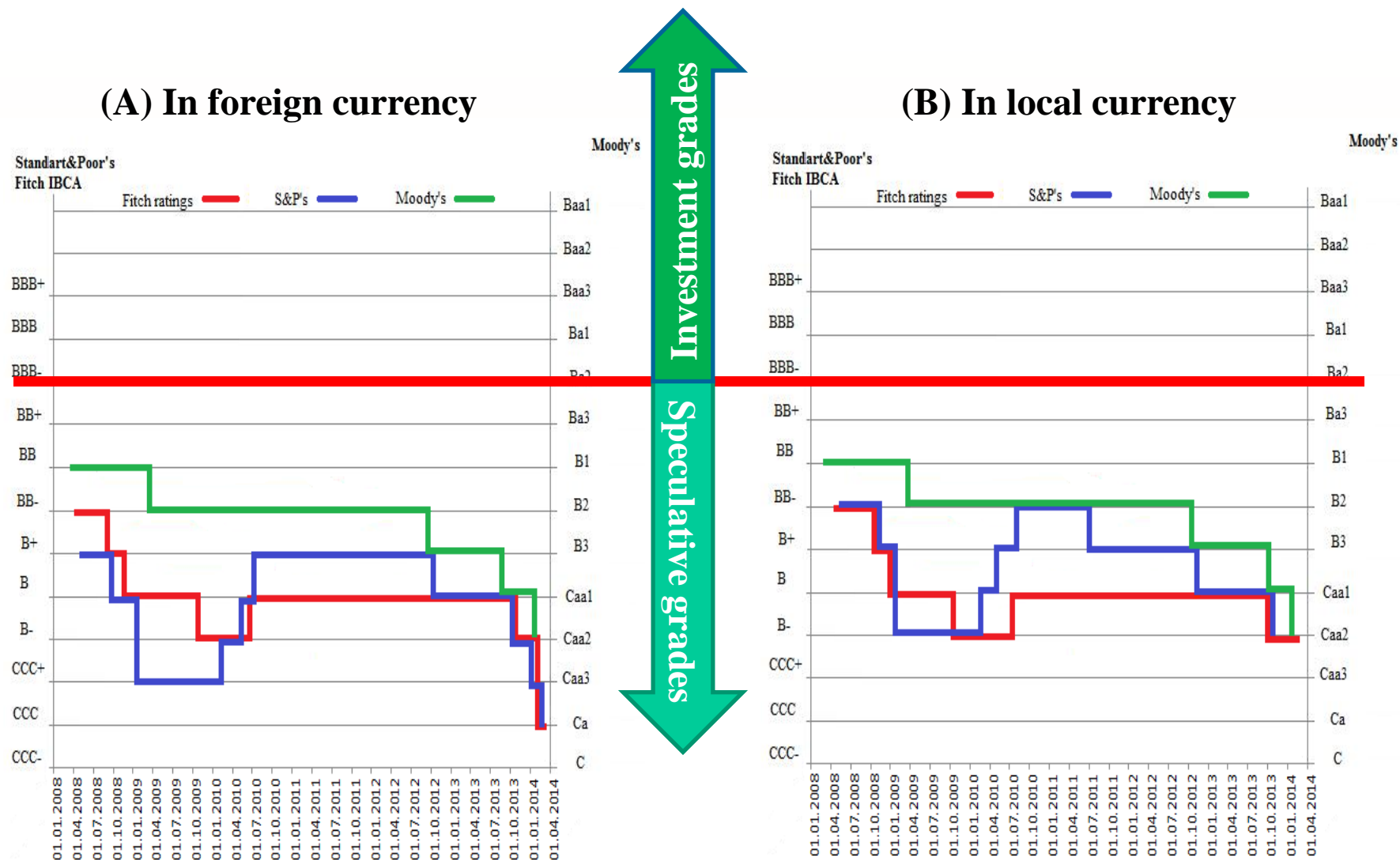
- Nord Stream project pipelines
- Yamal pipelines
- Ukrainian transit flows
- South Stream project pipelines



Bottlenecks at Ukrainian route to Southern EU
(justification for South Stream with new delivery point):

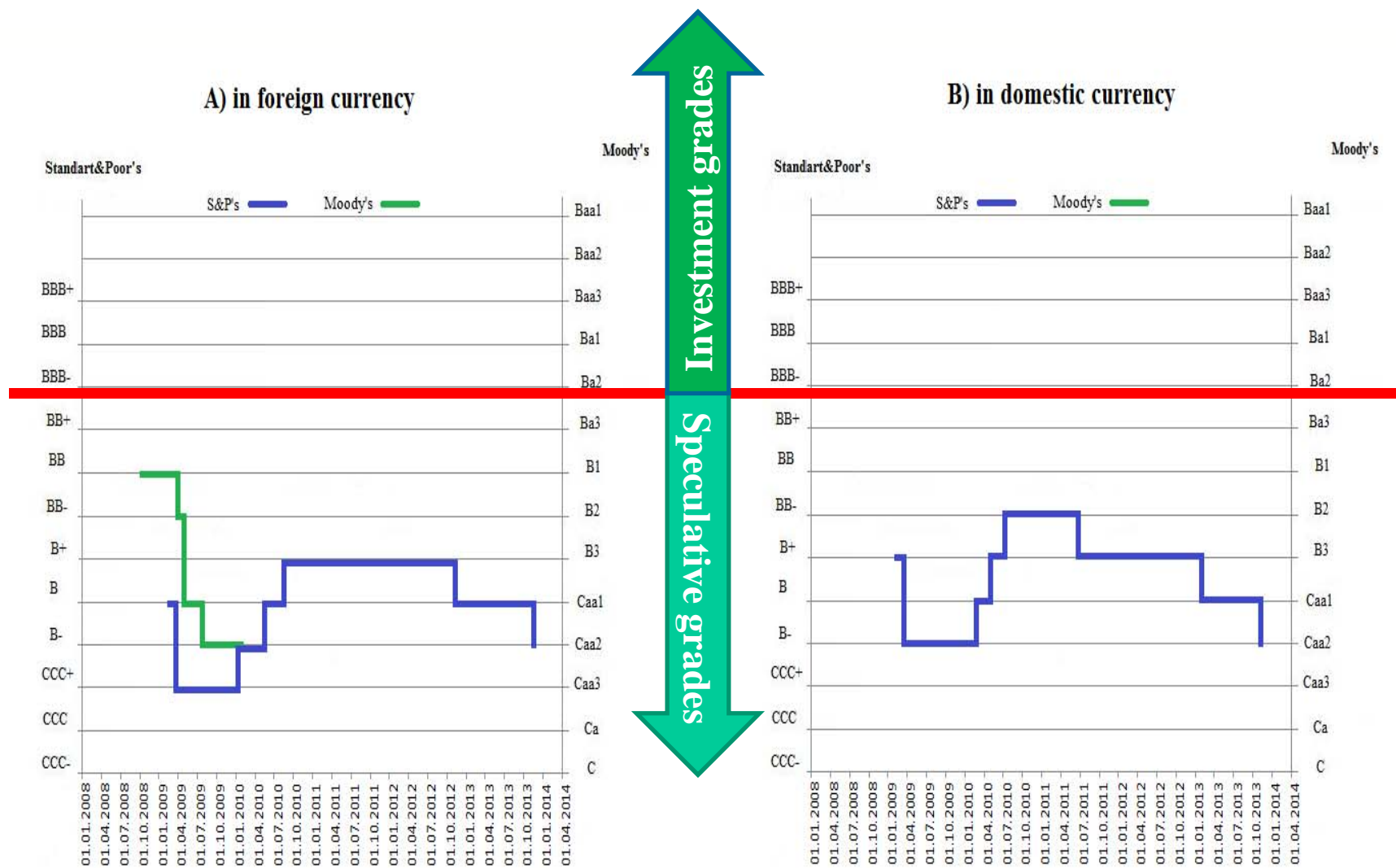
- ① Ukraine transit crises Jan'2006/Jan'2009
- ② TAG auctions Dec'2005/May'2008

Figure 7. Ukraine: evolution of long-term credit rating



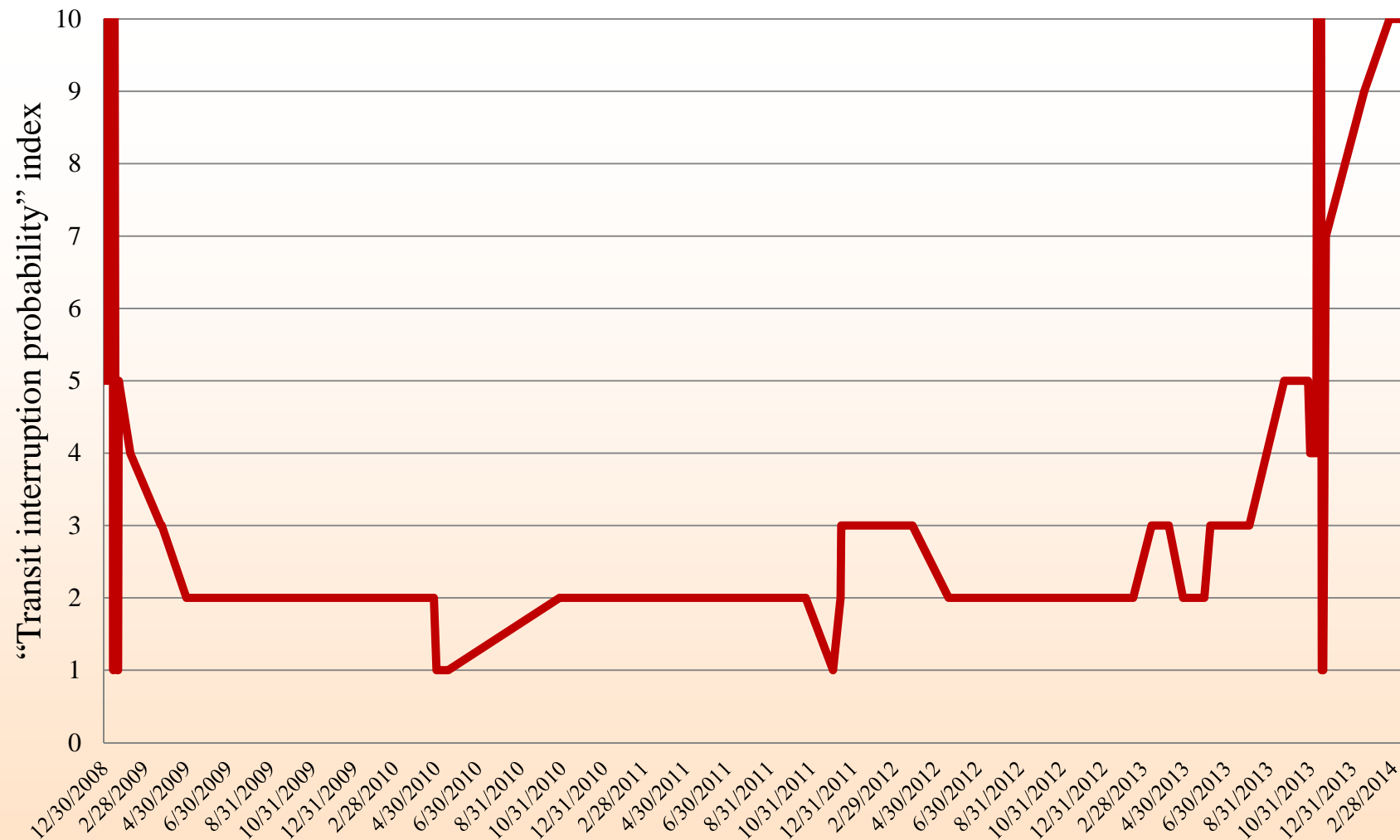
Calculations made by M.Larionova, Russian Gubkin State Oil & Gas University, Chair “International Oil & Gas Business”, Masters programme 2013-2015, based on credit rating agency’s data.

Figure 8. NJSC Naftogaz of Ukraine: evolution of long-term credit rating



Calculations made by M.Larionova, Russian Gubkin State Oil & Gas University, Chair “International Oil & Gas Business”, Masters programme 2013-2015, based on credit rating agency’s data. 8
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Figure 9. Ukraine: “transit interruption probability” index



Calculations made by M.Larionova, Russian Gubkin State Oil & Gas University, Chair “International Oil & Gas Business”, Master’s programme 2013-2015, based on the methodology jointly developed with the author

Figure 10. South Stream construction vs Ukraine GTS modernization: illustrative comparison of technical and financing costs dynamics, incl. comparative risks & credit ratings within time frame

