# Table of Contents

Karel Hirman

# Energy Efficiency and the Market Liberalization

Energy, energy security and the threat of climate change have been the central issues of international politics in recent years. This was also noticed at the last meeting of the International Energy Agency (IEA) member countries being held in October 2009 at its headquarters in Paris. The ministers of 28 member states (including Slovakia) together with the European Commission agreed that the world is facing unprecedented economic, environmental and security threats and that all of them are, more-or-less, related to energy. Their solution aims at creating a safer, cleaner and more sustainable energy future. In other words, it is inevitable to switch into a low-carbon energy and economy. The events of recent years suggest that the global economy finds itself at the beginning of the end of the 'oil era'. One assumes that traditional fossil fuels, particularly oil, gas and coal, will be, for at least two decades, the basic raw materials for global energy, i.e. for our global civilization. It is also clear, however, that the increase in consumption of the fossil fuels, due to the increase in living standards in the countries of Asia, Latin America or Africa, is limited not only by the size of their reserves, but also by the impact on the environment and geopolitical-security risks arising from their location and transportation routes.

The policy of diversification of production and transportation of hydrocarbons, or other investments in exploration and innovations in their extraction, simply cannot be the only response to these problems and threats. Although, neither

***Karel Hirman*** *is a Director of the Energy Policy Department at the Slovak Innovation and Energy Agency.*

Hirman, K., "Energy Efficiency and the Market Liberalization", *International Issues & Slovak Foreign Policy Affairs* Vol. XIX, No. 1|2010, pp. 3-7

of these should not be underestimated for there is a high possibility that our Planet Earth still has substantial hidden reserves. The question lies, however, in the profitability of their production as well as the impact of their extraction and use on the environment. However, there have been some remarkable achievements, especially in the USA, regarding the extraction of natural gas from the so-called unconventional sources, which have a significant impact on global markets; and not only on those with the liquefied natural gas (LNG), but also indirectly on those with oil.

The expansion of use of renewable energy sources (RES) might be one of the responses to these global energy challenges. And the European Union can be considered a pioneer in promoting them. However, it appears that the way chosen by the EU, i.e. state grant and price policy for energy producers using RES, is not sustainable given the current technical level and efficiency of these facilities. It does create pressure on public finances, in many member countries this leads to a significant increase in the price of electricity for final consumers, and causes serious secondary problems with regulation of energy networks of entire countries and regions within the EU. The Czech Republic might serve as a good example. The support for the electricity production from the sun and wind will increase the energy costs of every Czech household annually by approximately two thousand Czech crowns (80 €).[1] The Czech example shows just how uncoordinated and excessively subsidized development of electricity production from RES, specifically from the sun (photovoltaic), can cause exactly the opposite effects than the one originally intended.

*The events of recent years suggest that the global economy finds itself at the beginning of the end of the 'oil era'.*

Slovakia faces similar problems at present. It is not only the notable increase of prices for final consumers, but also serious technical difficulties in operation and regulation of the whole electricity grid. Now, as a paradox, in many EU countries the regulation of the new resources based on RES requires building of the new capacities based on fossil fuels (mostly natural gas). They maintain that the stability of the system were due to the differences in the production of RES because of natural conditions (windlessness, overcast skies, etc.). As a result, there is a very doubtful balance of emissions, which, on one hand, are

[1] http://www.novinky.cz/ekonomika/192727-ucet-za-solarni-energii-pro-domacnost-pristi-rok-az-2000-korun.html.

saved during the operation of RES, but, on the other hand, are produced while over-extracting fossil regulatory resources.

Considering the abovementioned, the energy efficiency could be seen as an ever more important and very effective tool. Its importance is growing not only because of the turbulent events in the global market of energy raw materials, particularly oil and gas, but also because of the threat of global warming and climate change. Investments in energy efficiency automatically causes reduced consumption of fossil fuels and thus reducing production of carbon dioxide, requiring none or minimal investment for eliminating the possible negative impact on technical stability and serviceability of energy networks, saving consumers money and public budgets and, finally, reduce their dependence on producers of energy resources. These investments, naturally, lead to an increase of employment, above all in the services sector, increasing demands on the knowledge level of the workforce and increasing innovation in the business environment.

*As a paradox, in many EU countries the regulation of the new resources based on RES requires building of the new capacities based on fossil fuels .*

The EU has recognized that, and has set as one of its primary goals of Energy Policy by 2020, the 20% reduction of consumption compared to forecasts for this year, as estimated by the EC in its *Green Paper on Energy Efficiency*. The consumption between 2001 and 2005 was taken as the reference consumption. Directive 2006/32/EC of the European Parliament and of the Council of April 2006 on energy end-use efficiency and energy services follows the above-mentioned goal. The Directive obliged each member country to save 9% of final energy consumption in the period of 2008 to 2017. In the case of Slovakia, this exactly means achieving cumulative savings of 37,215 TJ.

Slovakia has decided to achieve this goal gradually in three three-year cycles. For this purpose, the *Energy Efficiency Action Plan* for 2008 to 2010 was prepared defining the distinct measures with their numerical impact on the specific amount of savings. Gradually, two action plans for the next three-year cycles will be prepared as well. It has to be admitted, openly, that even if similar legislative-administrative acts at the EU level or the level of state have not been adopted, the savings in the production, distribution and consumption of energy would have to be carried out anyway. Business, public sector and population have been and will be forced to save, mostly because of the usual development of market and financial reasons. If any Slovak company or even an entrepreneur wants to

be competitively successful in the market, the costs must be cut. And energy costs, in many cases, are crucial. The population, similarly, under pressure of rising prices of energy, which are a significant part of family budgets, is forced to save and to limit its consumption to an affordable level. The government and the public administration are under similar pressure. The fact that reserves are not small is proven by statistics, under which the energy intensity of gross domestic product or per capita energy consumption in Slovakia is still significantly higher than the average in countries of the 'old' EU-15. The liberalization of the internal electricity and natural gas market is considered another important tool to strengthen the EU's energy security and reducing energy prices. The competent authorities of the EU, therefore, during 2009 have agreed upon the so-called third package of liberalization, which completes the conditions and the rules already defined in Directives 2003/55/EC and 2003/54/EC. It should encourage more open markets, improve consumer rights, strengthen the power of national regulatory authorities and strengthen solidarity among consuming regions in the event of a serious supply disruption. Perhaps the most substantial change, which caused the stormiest debate between member countries and politicians in the EU, is the unbundling of production and supply of electricity and gas from the transmission networks. 'Legal unbundling' is now in force, which means that companies operating in the aforementioned sectors had to be divided into independent legal entities and independent companies, with separated management, but may remain in joint ownership.

*Perhaps the most substantial change, which caused the stormiest debate between member countries and politicians in the EU, is the unbundling of production and supply of electricity and gas from the transmission networks. In Slovakia, such an example is the SPP group.*

In Slovakia, such an example is the SPP group, or three regional energy distribution companies. A new package eventually compromisingly determined for members states three options: ownership segregation, establishment of an independent system operator or the establishment of an independent transmission network operator. The last alternative was just the one that provoked the greatest political battle, and which Slovakia actively promoted. This option leaves integrated production, supply and transmission, but determines strict rules for companies, which will force them to operate independently.

The transmission system will be supervised by the supervisor body, which will consist of representatives from the energy company itself, third parties and representatives of the transmission system operator. The national regulatory authority will approve all trade and financial agreements between the company and the operator of the integrated system. The transmission system operator must also submit to a regulatory body with a ten-year network development plan, which must be in accordance with the European-wide plan. As happens in similar cases, to strengthen competition in the gas market, which remains dependent on imports from outside of the jurisdiction of the EU, exceptions from these strict rules were adopted for transnational gas pipelines, LNG terminals and storage of natural gas.

The new package also strengthens and consolidates the rights of consumers. By the year 2020, 80% of households should have smart measuring equipment, but under the condition that the test installation favors them economically. With these, EU authorities expect that the household will be able to choose flexibly the suppliers, who in turn will be able to offer affordable and flexible delivery depending on time of day or season. The European Commission should also prepare a brief, clear and useful list of consumer rights. Thus, the consumers will have the right to change electricity or gas suppliers within three weeks with no fees. Their complaints should be checked by the special authority, a sort of Ombudsman for the energy sector. Likewise, the Member States have to protect legally the socially disadvantaged consumers and to take measures to address energy poverty. One of the important changes is the establishment of the Agency for the Cooperation of Energy Regulators. Even though the Agency will only draft non-obligatory guidelines and complement national regulatory bodies at the European level, it will be able to decide on cases of cross-border deliveries.

Reducing energy consumption, coordinated, economically and environmentally sustainable production from RES based on specific local conditions in individual countries and regions, together with efforts for further liberalization of the energy markets are certainly very ambitious strategic goals. In their application, however, we must not forget the reality that surrounds us, especially towards the traditional producers of fossil fuels outside the EU territory and jurisdiction. Their application must not eventually lead to the obstruction of the EU energy market and companies that operate in this market and may not lead to excessive price increases for consumers, reducing the competitiveness of European industry.

Michael Gonchar, Olexandr Malynovsky

# From the Energy Crises to Mutual Trust through Transparency in the Upstream – Midstream – Downstream Chain

Abstract: *Events of January 2006 and January 2009 were included in European history as periods of the gas crises. Although these conflicts arose between Ukraine and Russia, their scale and impact reached the level of 'gas wars' and affected the entire European continent, creating an atmosphere of mutual distrust in the chain 'Supplier – Transit Country – Consumer'. Their impact on energy cooperation in Europe can be largely comparable with the effects of the Cuban Missile Crisis and the Middle East conflicts for the military-political sphere in the world at the time. Therefore, in author's opinion, the continent needs to develop measures of confidence, by analogy with how it was done in the military sphere in the 70-80s of the last century. As he argues, developing and adopting such measures would promote decreasing of tensions that appeared during gas crises and has been deepening as a result of less extensive, but threatening the oil transit, quarrels in the Russian-Belarusian and Russian-Ukrainian relations on the verge of 2009-2010.*

The arms race during the 1960-70s of the 20th century led to the largest concentration of military forces between the North Atlantic Alliance and the Warsaw Treaty Organization in Europe as well as over the world. It was

***Michael Gonchar*** *is a President of the Center Strategy XXI.* ***Olexandr Malynovsky*** *is a Partner of the Consulting Group LEGIS.*

Gonchar, M., Malynovsky, O., "From the Energy Crises to Mutual Trust through Transparency in the Upstream – Midstream – Downstream Chain", *International Issues & Slovak Foreign Policy Affairs* Vol. XIX, No. 1|2010, pp. 8-44.

The authors express gratitude to their colleagues, Andriy Chubyk and Serhii Zhuk, for translating and organizing the article as well as for expert cooperation in the framework of the Center *Strategy XXI* project *Energy Resources and their Delivery Infrastructure: The Potential for Inappropriate Operation in Europe.* Special thanks go to the NATO Liaison Office in Ukraine, which supported this project.

an outcome of mutual distrust and suspicion, which generated the growth of tensions in international relations. Such tensions resulted in dangerous crises – the Caribbean missile crisis in 1962 and the Arab-Israeli wars in 1967 and 1973. These, in turn, boosted the arms race further, including the nuclear-missile arms race. Awareness by the heads of the leading countries that the situation was critical led to a declaration of policy of détente, which became the stimulus for the development of measures to strengthen confidence in the military sphere. These measures formed a system of political and legal means that were necessary to ensure international security. The implementation of such means by states enabled to reduce the level of mutual distrust and tensions; created more favorable conditions for international cooperation; reduced the rate of an arms race; and then opened up opportunities to proceed to reduction of the armed forces and armaments. All measures were aimed at preventing international conflicts that could be caused by one country's inaccurate estimations of the military activities of another state. They were actualized through the exchange of relevant information about such activities. In the documents, adopted at different times, the list of confidence-building measures in the military sphere was agreed: prior notification of large-scale military exercises, large troop movements; certain types of military activities, exchange of observers; exchange of annual plans of military activities etc. In addition, the parties came to consent that agreed activities would be under adequate forms of verification.

Due to development and improvement of confidence, an institution of international control in the OSCE was initiated which has dealt in the fields of disarmament, environment, outer space, the use of nuclear energy. Confidence-building measures are contained in a number of documents crucial for Europe at those times and at present which were signed by the parties during the Cold War confrontation *(Final Act of the Conference on Security and Cooperation in Europe in 1975; Concluding Document of the Madrid Meeting in 1980; Document of the Stockholm Conference on Confidence- and Security-Building Measures and Disarmament in Europe in 1986; Concluding Document of the Vienna Meeting in 1989, etc.)*.

Events of January 2006 and January 2009 were included in European history as periods of the gas crises. Although these conflicts arose between Ukraine and Russia (from a formal point of view, between the national gas companies – Ukrainian NAK Naftogaz and Russian JSC Gazprom), their scale and impact reached the level of 'gas wars' and affected the entire European continent, creating an atmosphere of mutual distrust in the chain 'Supplier – Transit Country – Consumer'. Their impact on energy cooperation in Europe can be largely comparable with the effects of the above mentioned Cuban

Missile Crisis and the Middle East conflicts for the military-political sphere in the world at the time. Therefore, in our opinion, the continent needs to develop measures of confidence, by analogy with how it was done in the military sphere in the 70-80s of the last century. Developing and adopting such measures would promote a decreasing of tensions that appeared during gas crises and has been deepening as a result of less extensive, but threatening the oil transit, quarrels in the Russian-Belarusian and Russian-Ukrainian relations on the verge of 2009-2010.

To understand the possible course of actions it is necessary to assess carefully sources, which potentially foster tensions and distrust. In the energy sector it is determined as an Upstream Zone. For Europe this zone is Russia as the biggest energy supplier (for a number of countries like Finland, Baltic countries, Poland, Belarus, Ukraine, Slovakia, Moldova, Hungary, Bulgaria and Russia is an exclusive or dominant supplier of hydrocarbons).

During the Cold War the main goal of NATO energy security was to ensure the supply of fuel and lubricants to ally forces. So, it is not surprising that NATO did not react to the events of the 1973 Arab oil embargo. However, given the changes in global political and strategic realities, the concept of 'energy security' has become more embracing as well as the category 'energy resources' has become more meaningful. One cannot but agree with the assessment of SIPRI, "energy for all countries is more than just a market commodity. It is a specific strategic commodity".[1] And given the fact that some countries play a disproportionately large role in supplying oil and gas to the world market, this makes their policy extremely important for global economy.

Almost 2/3 of the world's gas reserves are concentrated in only two countries – Russia and Iran, whose political course creates more and more problems for Europe. "Russia's actions in January 2006 to suspend gas supplies to Ukraine renewed concerns about the possibility to use energy supplies to Europe as a weapon and directly led to intensive and comprehensive debates on this issue, but this time in the framework of the common EU energy policy."[2] There is no wonder that energy security has also become a subject of discussion in NATO. Yes, NATO should not intervene in the market issues, but energy use went beyond the notion of commodity market transactions. The bottom line for pointing out the attention of the Alliance on before unusual for NATO problems of energy security was the *Riga Summit Declaration in 2006* (p. 45) of which called

[1] *SIPRI Yearbook 2007: Armament, Disarmament and International Security.* (Kyiv: Zapovit, 2008), p. 244; (translation from English).

[2] Ibid, p. 247.

the attention of the member countries to it. The *Bucharest Summit Declaration* is more detailed about this, "Allies have identified principles which will govern NATO's approach in this field, and outlined options and recommendations for further activities. Based on these principles, NATO will engage in the following fields: information and intelligence fusion and sharing; projecting stability; advancing international and regional cooperation; supporting consequence management; and supporting the protection of critical energy infrastructure."[3] Further developments in January 2009 confirmed the relevance of the energy security issue for NATO member states and the EU. And rather controversial projects of gas transmission infrastructure development that were actively lobbied by Russia after the gas crises in 2006 and 2009 gave rise to doubts about the sincerity of the declared intentions.

## Some Aspects of the Transformation of Russian Policy as a Leading Supplier of Hydrocarbons to Europe

The peculiarities of 2009 were not only the January gas crisis in relations between Russia, Ukraine, and the EU, but also the formation and adoption, in Russia, of a package of basic strategic documents: *National Security Strategy of the Russian Federation until 2020, Energy Strategy of Russia until 2030, and Military Doctrine of Russian Federation*.[4] Moreover, in 2009 Russia made several steps that were hardly conducive to increasing confidence in its external energy policy. First, unveiling in April by Russian President certain 'ersatz' of the *European Energy Charter Treaty*[5] (ECT) instead of advancing the current ECT. Second, continued in June – albeit not so successful – the process of creating GasOPEC as the Forum of Gas Exporting Countries.[6] Third, the withdrawal in August by the Russian Prime Minister Russia's signature from the ECT. By these steps, Russia put itself beyond the agreed during the first half of the 90s by

[3] "Bucharest Summit Declaration" (April 3, 2008), p. 48; http://www.nato.int/cps/en/natolive/official_texts_8443.htm.

[4] The Military Doctrine was adopted in February 2010, but its elaboration was completed by Fall 2009. See "New Military Doctrine of Russian Federation is almost Ready" (October 8, 2009); http://www.prime-tass.ru/news/articles/-201/%7B66F6FF60-4642-4E42-9702-A9A3EF36C5EF%7D.uif/.

[5] The authors mean the document "Conceptual Approach to the New Legal Framework for Energy Cooperation (Goals and Principles)" (April 21, 2009); http://www.kremlin.ru/text/docs/2009/04/215303.shtml.

[6] http://www.gecforum.org/.

51 countries' rules, albeit imperfect, in the energy sector. Last year's proposal (*Treaty on European Security)* for a new European security architecture[7], which has been undergoing tests by precedents of Kosovo, South Ossetia and Abkhazia, did not add positive views of Russia. Estimation of all these steps leads to the conclusion that Moscow has been trying to reformat the European political and energy space for its own interests, to delineate in this space its exclusive zones of influence.

Given the scale of Russia and its role in European affairs, as well as alarming signs of aggressive behavior that came out in the Caucasus events in August 2008, the strategic documents deserve thorough analysis. Russia's bias towards large-scale infrastructure projects in the field of transportation of hydrocarbons energy resources in addition to the tendency of the Russian leadership to use oil and gas as tools of political influence on its neighbors, that have been clearly shown since 2003 (adoption of the first *Energy Strategy of Russia until 2020*), impels the necessity of consideration of the possible vectors of Russian activity in Europe.

*The peculiarities of 2009 were not only the January gas crisis in relations between Russia, Ukraine, and the EU, but also the formation and adoption, in Russia, of a package of basic strategic documents: National Security Strategy of the Russian Federation until 2020, Energy Strategy of Russia until 2030, and Military Doctrine of Russian Federation.*

With regard to the *Energy Strategy of the Russian Federation,* its specific provisions continue the course of using energy resources and pipeline infrastructure as a political tool. Although it is formulated not so openly as in the previous version of the document ("Russia has significant reserves of energy resources and powerful fuel and energy complex that forms a background for development of the economics and instruments of internal and foreign policies realization."[8]), however, these provisions keep on the alert.

1. "Russia will step up efforts for consolidation of major regional gas producing centers (Central Asia countries, Iran) around its pipeline infrastructure and

[7] Draft "Treaty on European Security" (November 29, 2009); http://kremlin.ru/news/6152.

[8] "Energy Strategy of the Russian Federation until 2020", p. 1; http://www.energystrategy.ru/projects/ES-28_08_2003.pdf.

form a Eurasian integrated gas transportation system to ensure exports and transit from Asia to Europe"[9].

2. "Russian pipeline infrastructure will become the part of the energy bridge between Europe and Asia, and Russia will be its key management center."[10]

Formulated in such a way points of the strategy are a better disguised reflection of more explicit proposals that were worked out in 2007 during the development and finalization of the draft document: "Russia has capabilities [...] to strengthen its impact on other production centers, which are connected to Russia by a common energy infrastructure (Kazakhstan and Central Asia Republics)[11], [...] The role of Russia will be determined not only by our country's possibility to extract and supply energy resources of its own, but also by the possibility of effective dispatching of the transit energy flows of third countries ..."[12]

*The threat of energy supply restriction or suspension, masked as a commercial conflict, can affect the probable enemy through the simultaneous mobilization of lobbying capacity within the country, extensive media-psychological campaign, and cyber attacks.*

It means that these points settled now in an official document have been clearly focused on the continuation of the policy of energy sector monopolization, by means of pipeline infrastructures, not only in Russia, but also internationally. But, nobody empowered Russia to do so. Given Russia's withdrawal from the ECT, it cannot but alert.

The importance of Russian resource potential for strengthening its influence is also described in *National Security Strategy* (paragraph 9): "The transition from opposing blocs to principles of multivector diplomacy, together with Russia's resource potential and pragmatic policy for its use, have broadened the possibilities for the Russian Federation to reinforce its influence on the world stage."[13]

Together with p. 17 of the NSS "A determining aspect of relations with NATO remains the unacceptability for Russia of plans to extend the alliance's military

[9] "Energy Strategy of the Russian Federation until 2030", p. 54; http://www.energystrategy.ru/projects/docs/ES-2030_(utv._N1715-p_13.11.09).doc.

[10] Ibid, p. 55.

[11] "Concept of Russia's Energy Strategy for the Period till 2030" (Moscow: Ministry of Industry and Energy of Russia, Institute of Energy Strategy, 2007), p. 36 (draft).

[12] Ibid, p. 78.

[13] "National Security Strategy of Russia Federation until 2020", p. 3; http://www.scrf.gov.ru/documents/99.html.

infrastructure to its borders, and attempts to empower NATO with global functions that contravene with international law..."[14], where strategic deterrence is determined, looks logically: "Strategic deterrence presupposes the development and systematic realization of a range of interconnected political, diplomatic, military, economic, informational and other measures, intended to forestall or reduce the threat of destructive actions by an aggressor state (a coalition of states). Strategic deterrence is realized with the use of the state's economic resources..."[15]

Since the new *Military Doctrine of Russia* describes modern military conflicts as "...the integrated application of military forces as well as non-military means and capabilities"[16], the main goal of deterrence is formulated as "neutralization of possible military dangers and threats by means of political, diplomatic and other non-military means"[17].

A list of non-military means may include energy and infrastructure potential, which has been intensively augmented by Russia. The threat of energy supply restriction or suspension, masked as a commercial conflict, can affect the probable enemy through the simultaneous mobilization of lobbying capacity within the country, extensive media-psychological campaign, and cyber attacks. These measures can create a cumulative effect of heterogeneous pressure on countries' public authority in order to achieve required concessions. It is no wonder that in the *Military Doctrine* the information context of modern military conflicts is specified: "Carrying out of information warfare actions beforehand in order to achieve political objectives without use of the armed forces, and later on – in order to form the favorable attitude of the world community toward the use of the armed forces."[18]

Russian State Duma Deputy Speaker, the head of the Russian Gas Society Valery Yazyev, speaking at a parliamentary hearing, also drew the attention on the need to strengthen the information component in the context of the gas crisis in January 2009: "Russia lost the information war in Europe the during gas conflict with Ukraine", such was the conclusion of the influential Russian politician, though disputable. Yazyev noted that the information component had been emerging for a number of years as a more significant issue for Russia's national security. "Achievement of information superiority became the indispensable element in gaining a victory at any military or political confrontation ...", said Yazyev.[19]

---

[14] Ibid, p. 26.
[15] Ibid, pp. 7-8.
[16] "Military Doctrine of Russia", p. 4; http://www.scrf.gov.ru/documents/33.html.
[17] Ibid, p. 5-6.
[18] Ibid, p. 5.
[19] V. Yazyev, "Russia Lost Information War in Europe during Gas Conflict with Ukraine", *Oil of Russia* (April 14, 2009); http://www.gazo.ru/images/upload/ru/1555/GL_15.04.2009.doc.

## Peculiarities of Gas Crises

The likelihood of the use of hydrocarbon energy resources and pipeline infrastructure as political leverage, accompanied by media-psychological campaign, grows nonlinearly with the rise of energy prices. State control over energy extraction and transportation and the lack of a liberalized internal market in countries with authoritarian regimes increase temptation of their use as a tool for achieving foreign policy goals. Diversification of routes and build-up of infrastructure overcapacities by energy suppliers increase drastically the possibility of the creation of an energy shortage on some targeted foreign markets, which may be an object for energy expansion.

*The European Union should not distance itself from bilateral gas disputes arising outside the EU because the EU countries, being the consumers, will be affected within a short period of time in case of escalation of a dispute to a conflict.*

It is not surprising that the 2006 and 2009 gas crises in Europe occurred in the period of the surge and volatility of hydrocarbon energy prices. The situation with gas supply disruption in January 2009, which destructively affected the energy security of Ukraine and the European Union, encourages enhancement of early warning mechanisms, development of high quality measures to minimize negative consequences in case of protracted disruptions of energy supplies. The consequences of January 2009 have a wide range effect, pan-European scale and affect the style of life and welfare of both Ukrainian and EU citizens. However, the situation is still unclear – what took place in January 2009: disruption of gas supply by Russia or interruption of transit by Ukraine? For obvious political reasons, the European Commission avoids official answers on these questions stating only a fact: "On the night of January 6-7, all supplies from Russia through Ukraine to the EU were cut. There were no gas supplies from Russia to Europe from January 7 to January 20."[20]

Some EC representatives emphasize that the issue of who caused the 2009 crisis is not important. Clearly, such equivocation is very wily. However, this unanswered question will always tempt the side, which initiated the crisis, to use

[20] "The January 2009 Gas supply Disruption to the EU: an Assessment", Commission Staff Working Document. Accompanying document to the Proposal for a Regulation of the European Parliament and of the Council Concerning Measures to Safeguard Security of Gas Supply and Repealing Directive 2004/67/EC (Brussels, 2009), p. 4.

again its 'secret weapon'. Certainly, one can agree with the EC representatives who claim that the most important issue is to develop mechanisms to minimize the negative consequences in case a relapse occurs. But we should note that the issue should be more thoroughly examined how to create a system that would make an impossible occurrence of future energy crises?

This issue requires taking additional measures to ensure energy security on the European continent. And these measures should be taken within the EU because, according to our estimates, bilateral relations like Russia – Ukraine or EU – Ukraine or Russia – EU to resolve problems in gas supply to Europe do not meet the requirements of trilateral technological chain 'Extraction – Transportation – Consumption' (Russia – Ukraine – EU or Russia – Belarus – EU). That is why we believe that the European Union should not distance itself from bilateral gas disputes arising outside the EU because the EU countries, being the consumers (end of a pipe), will be affected within a short period of time in case of escalation of a dispute to a conflict. Brussels assessment of the 2009 gas crisis as a commercial dispute of two corporate entities of non-EU country members reflects only partly the real background of the events. However, this assessment is inaccurate because of its incompleteness and the desire to distance itself from the problems outside the EU. With such approach, crises will cross EU borders and remind about themselves. The distancing does not conduce to energy security of the European Union.

Let's consider the most characteristic features of the gas crises. We can distinguish some features, which were typical and common for 2006 and 2009 events:

- the crises concerned the whole Europe and took place in trilateral format. In other words, in both of the mentioned gas crises three leading European players were involved: Russia as a gas supplier, Ukraine as a gas transit country, and the EU as a gas consumer;
- the crises happened almost according to the same scenario: gas supplier reduced (in January 2009 – fully cut off) gas delivery to Ukraine, which led to reduction (in January 2009 – to complete cut off) of gas transit through Ukraine. As a result, European consumers received less gas than they had contracted from the Russian supplier;
- none of the crises was prevented by political or legal means;
- the crises were resolved by political means. Legal mechanisms were not involved or played a secondary role. The achieved settlements did not have complex nature and can be regarded as a kind of an *ad hoc settlement.*
- end users, national governments of consuming countries and the European Commission did not have a complete picture of the development of the crises based on data from the metering system because the equitable system of gas flow control just does not exist.

Thus, the pan-European gas crises of 2006 and 2009 demonstrated a lack of effective and efficient mechanisms to prevent and resolve disputes regarding the supply and transit of natural gas to the European continent. Legal mechanisms to resolve gas disputes – both at multilateral and bilateral levels, on the one hand, and at international and the corporate levels, on the other hand – were ineffective and inoperable for various reasons. We should consider them further.

## Existing Mechanisms of Dispute Settlement

### *Multilateral Mechanisms*

Ukraine and the European Union have signed and ratified the *Energy Charter Treaty*, while the Russian Federation signed the *Treaty* but did not ratify, and applied it only provisionally (to the extent that such provisional application is not inconsistent with the Constitution, laws or regulations of the Russian Federation – as stipulated by Article 45.1 of the *Treaty*[21]). Thus, the ECT did not establish a single legal framework for three actors of the gas crises; on the contrary, there were two different legal regimes under the *Treaty* between these actors: the EU and Ukraine used the ECT on a regular basis and in full, while the Russian Federation applied the provisions of the ECT on a provisional basis to the extent limited by Russian domestic law. By virtue of this, the ECT could not be effectively used to resolve the gas crises between three actors, because it regulated the relations between these actors differently. In this regard, there is a noticeable fact that during the gas crises the Russian side often referred to the ECT as a legal basis for the EU to file claims against Ukraine. In particular, on January 5, 2009 the deputy chairman of Gazprom called the European side to do so, and on January 14, 2009 Deputy Prime Minister of Russia I. Sechin said, "We are surprised that European companies – Russian gas buyers – have not yet recourse to Article 27 of the ECT, which allows court proceedings against a transit country."[22]

On the one hand, this statement indicates Russia's intent to transfer the gas crisis in the bilateral (EU – Ukraine) format without the involvement of the Russian Federation, which would allow Russia to get rid of the liability in connection with the gas crisis. It also confirms the conclusion that Russia's standing in a different

[21] "The Energy Charter Treaty and Related Documents"; http://www.encharter.org/fileadmin/user_upload/document/EN.pdf.

[22] "Russia will also Appeal to the Court" (January 14, 2009); http://www.newsru.com/finance/14jan2009/papageorgiu.html.

(as compared to the EU and Ukraine) legal regime under the ECT did not give an opportunity to apply a gas crisis settlement mechanism which would be common and single to all three actors. Furthermore, it can be assumed that Russia did not consider provisions of the ECT on Dispute Settlement as legally binding on itself.[23] On the other hand, Article 27 of the ECT, invoked by the Russian side, envisages dispute settlement on an international, rather than corporate level. Mechanism for dispute resolution stipulated by Article 27 of the *Treaty* is a long-lasting process (according to that article, only the formation of an arbitral tribunal may take more than 180 days).[24] With regard to the gas crises, the mechanism of Article 27 could be launched by other European States, which signed the ECT (but not by European companies), only in the case that Ukraine as a state would violate provisions of Article 7 of the ECT on freedom of transit, but such violations didn't take place, and there are no evidences of such violations.[25]

It should be noted that the ECT also provides for a mechanism of dispute settlement between a private party (i.e. a company) and the State (Article 26 of the ECT), but this mechanism may be only launched if a private party acts as investor, and a dispute arises about investments made by a private party in another (foreign) State. Moreover, as mentioned in Article 26 itself, it may be applied only to disputes which concern an alleged breach of an obligation of a State under Part III (Investment Promotion and Protection) of the ECT while Article 7 regarding freedom of transit is placed in Part II (Commerce); therefore, the ECT clearly excludes the application of dispute resolution clause under Article 26 to transit disputes.

*The ECT did not provide for a quick and effective resolution of gas crises.*

Probably, taking into account the above considerations, the representative of the European Commission stated on January 6, 2009 that the Commission saw no grounds for using the ECT against Ukraine.[26]

Thus, the ECT did not provide for a quick and effective resolution of gas crises. The importance of the ECT as an instrument of multilateral gas crises

[23] M. Gutkin, "Russia-Ukraine Gas Dispute: Lawyer's Comments" (January 15, 2009); http://www.voanews.com/russian/mobile/displaystory.cfm?id=193754.

[24] "The Energy Charter Treaty and Related Documents"; http://www.encharter.org/fileadmin/user_upload/document/EN.pdf.

[25] "Press Releases by NJSC Naftogaz of Ukraine"; http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=INT;n=46449.

[26] "EU Commission will not Apply European Charter Provisions against Ukraine"; http://novynar.com.ua/business/49966.

settlements was finally devaluated when the Russian Government, by adoption on July 30, 2009 *Resolution No. 1055,* expressed its intention not to accede to the ECT.[27] Thus, since October 18, 2009 Russia has not been applying the ECT even provisionally. In this regard, there is a notable statement made on August 25, 2009 by the Secretary General of the Energy Charter Secretariat that the decision by the Russian Federation not to become a Contracting Party to the Energy Charter Treaty "is detrimental to Russia, to the Energy Charter constituency as a whole, and to international actors in the energy sector. Renunciation of the only existing multilateral treaty governing important aspects of the energy sector casts doubt on the preparedness to accept shared rules and predictability for the energy sector by an important actor. In a globalized world, the energy sector needs internationally legally binding rules as provided by the Treaty."[28]

***Bilateral Intergovernmental Mechanisms***

At the bilateral intergovernmental level there is also lack of effective and adequate mechanisms for gas crisis resolution. International legal relations between Ukraine and the Russian Federation in the gas sector are regulated by three key Agreements which are effective today and will remain in force at least until the end of 2013 unless the governments of Ukraine and Russia agree on their early termination:

- *Agreement between the Government of Ukraine and the Government of Russia on Export of Russian Natural Gas to Ukraine and its Transit through Ukraine to European Countries from February 18, 1994 (1994 Treaty);*
- *Agreement between the Cabinet of Ministers of Ukraine and the Government of Russia on Guarantees of Transiting Russian Natural Gas via the Territory of Ukraine from December 22, 2000 (2000 Treaty);*
- *Agreement between the Cabinet of Ministers of Ukraine and the Government of Russia on Additional Measures to Ensure the Transit of Russian Gas through Ukraine from October 4, 2001 (2001 Treaty).*

The provisions of all these Treaties envisage resolution of possible gas disputes bilaterally through intergovernmental consultations and negotiations, which means that such dispute resolution depends entirely on the will and desire of both contesting parties. At that, 1994 and 2000 Treaties set a nebulous approach that "if the dispute is not resolved through consultations and

[27] Text of the Regulation available at http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=INT;n=46449.

[28] The Energy Charter Secretariat, "Message No. 827/09" (August 25, 2009).

negotiations within thirty days, the Parties will use the opportunities provided by the international law."[29]

Thus, at the interstate level between Ukraine and Russia:

- there are no legal mechanisms to resolve gas disputes, which application would not depend on the mutual consent of both parties and could lead to an unbiased independent decision that would be binding on both parties;
- the existing mechanisms of political (diplomatic) resolution do not provide for the possibility to apply them to disputes (crises) arising in a trilateral format.

A similar conclusion could be also drawn with regard to interstate relations between Ukraine and the EU. The *Partnership and Cooperation Agreement (PCA)* between the EU and Ukraine, dated June 14, 1994 (entered into force on March 1, 1998 and will remain in force until the *Association Agreement between Ukraine and the EU* is concluded and comes into force) only in general terms stipulated the principle of freedom of transit of goods (Article 11) and outlines the framework of cooperation in the energy sector (Article 61) by referring to the ECT. The PCA also envisages that disputes between its parties will be resolved either by Cooperation Council established under the PCA, or through referring to international intermediaries (Article 96). But neither decision of the Council, nor propositions of international intermediaries are binding on the parties. They only play the role of recommendations.

***Corporate Mechanisms***

Information on the dispute settlement mechanisms existing at the corporate level is quite limited given the confidential nature of the relevant corporate contracts between Naftogaz of Ukraine and Gazprom (for Russian natural gas transit through Ukraine) and between Gazprom and its European partners – recipients of natural gas (on the sale-purchase of natural gas). We can assume that commercial contracts include (like any other major international commercial contracts in most cases) provide for the arbitration procedure to resolve disputes. However, there is no information that any arbitration was launched after the 2006 gas crisis. At the same time, it is known that the arbitration proceeding was initiated in January 2009 between Naftogaz and Gazprom in connection with the 2009 gas crisis. However, the Chairman of

[29] Texts of the Agreements available at: http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=643_067&key=4/UMfPEGznhhfOo.ZiZDsrm5HI4ycs8Omsh8Ie6; http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=643_144; http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=643_221.

Gazprom said in his interview in late January 2010 that the arbitration had been suspended.[30]

In this context it is important to draw attention to the fact that during the second gas crisis Gazprom informed its European customers on January 13, 2009 that it had declared force majeure on its European gas exports through Ukraine.[31] Later, on December 31, 2009 the spokesman for Gazprom, Sergey Kuprianov, stated in his interview to the radio station Echo of Moscow that European consumers did not file claims against Gazprom related to the January 2009 gas crisis. "We declared force majeure and all our clients agreed with it", stressed Kuprianov.[32] In order to better understand the corporate context of gas crises and implications of above statements regarding the force majeure, it is important to be aware of the existing corporate principles of Russian gas transit to European consumers via Ukraine:

- the transit of Russian gas intended for European customers through Ukraine has been carried out in accordance with the transit contract concluded between Naftogaz and Gazprom;
- according to long-term contracts with European buyers, which were concluded in the times of the USSR, Gazprom hands over Russian gas to European customers at the western border of Ukraine[33] (former Soviet-European border), but not at the Ukrainian-Russian border.

It follows from the above mentioned that not Naftogaz but Gazprom shall be legally liable at the corporate level to the European buyers for Russian gas transit through Ukraine, including for possible interruptions in the delivery of gas to the Ukraine-EU border. Gazprom itself receives payments for Russian gas transit through Ukraine from European customers (more specifically, the gas price, paid by European customers to Gazprom, includes the cost of gas transit through Ukraine). In consideration for this, only Gazprom is liable to the European buyers for continuous gas deliveries through Ukraine. Moreover, hypothetically, Gazprom would be legally liable to the European buyers even in case the stoppage of gas transit is caused by actions of Naftogaz. Under such circumstances, there were no legal grounds for the notification by Gazprom of the European customers that force majeure on gas transit through Ukraine had happened, because only

---

[30] Ibid.

[31] http://www.gazpromukrainefacts.com/sites/default/files/Ukraine%20Gas%20Transit%20Fact%20Sheet%2011.11.09.pdf.

[32] http://www.echo.msk.ru/programs/razvorot/644112-echo/.

[33] Hereinafter "EU-Ukraine border" means cross points on Ukraine-Slovakia, Ukraine-Romania, Ukraine-Poland, Ukraine-Hungary borders, where the gas pipelines to deliver Russian gas to European countries pass the Ukrainian western border.

Gazprom was liable for gas transit to European consumers, and in fact the transit interruption was caused by Gazprom, not by Naftogaz.

In this regard the 2006 and 2009 gas crises, due to which European buyers received less Russian gas at the Ukrainian-European border, could lead to the filing of claims by European buyers against Gazprom and launching relevant arbitration proceedings. However, this did not happen. Instead, Gazprom seems to persuade European buyers to recognize the fact of force majeure on the gas crisis in 2009 (nevertheless, some mass media has recently informed that the Slovak company SPP submitted a statement of claim to the ICC International Court of Arbitration demanding Gazprom to compensate damages allegedly suffered by SPP in connection with the January 2009 gas crisis[34]). To achieve such recognition it took a considerable time – almost a year: from mid-January to late December 2009. This was rather a political decision that enabled Gazprom to avoid a legal liability to the European buyers as well as legal assessment of its behavior during the 2009 gas crisis.

*Not Naftogaz but Gazprom shall be legally liable at the corporate level to the European buyers for Russian gas transit through Ukraine, including for possible interruptions in the delivery of gas to the Ukraine-EU border.*

The described above situation with Gazprom's liability to European buyers for gas transit through Ukraine seems at first thought paradoxical. However, this is legacy and maintenance of the Soviet long-term contracts legal regime to supply natural gas to Europe. To put such situation in compliance with legal logics, it is necessary to change the legal regime of natural gas deliveries to the EU:

- European buyers should receive natural gas from Gazprom at the Ukrainian-Russian border;
- gas transit through the territory of Ukraine should be based on a transit contract between Naftogaz of Ukraine and European buyers.

Under these circumstances, the legal liability to European customers for gas transit through Ukraine will be directly shouldered on Naftogaz of Ukraine, which will receive payments for transit services from European customers, and the need for Gazprom's 'mediating and transiting' role will disappear.

It also indicates that the most effective format for resolution of corporate gas disputes related to the interruption of gas transit through Ukraine would be

[34] http://korrespondent.net/business/economics/1052283.

a tripartite format Gazprom – Naftogaz – European buyers. Bilateral corporate format Naftogaz – European buyers could be effectively applied only in case of existence of direct relationship between Naftogaz and European buyers on gas transit through Ukraine. This, in turn, is possible if the delivery point of Gazprom's gas for European buyers would be shifted from the Ukraine – EU border to the Russia – Ukraine border.

## General Conclusions

On the basis of the above-mentioned analysis the following key conclusions could be made:

- there is a lack of mechanisms (primarily legal) both at the international (Russia – Ukraine – EU) and the corporate (Gazprom – Naftogaz – European buyers) levels for trilateral resolution in a common legal framework of pan-European gas disputes, which happen in the trilateral format and in which three leading European actors – Russia as a gas supplier, Ukraine as a gas transit country and the EU as a gas consumer – are engaged;
- the existing at the international level (Ukraine – EU and Ukraine – Russia) mechanisms of the bilateral dispute resolution are political (diplomatic) by nature and cannot be applied to trilateral disputes (crises);
- the lack of trilateral gas dispute settlement mechanisms and a common legal framework that would regulate relations in the gas sphere between the three leading European actors (Ukraine, Russia, and the EU) encourages Russia to insist on the shift of gas crises resolution in the bilateral format (Ukraine – the EU or Naftogaz – European buyers) and gives Russia the possibility to avoid the assessment (primarily legal) of its behavior during gas crises;
- the existing at the corporate level legal regime of natural gas transit through Ukraine (according to which Gazprom transfers natural gas to European customers at the western Ukrainian-European border and is responsible to European customers for natural gas transit through Ukraine) will not allow to invoke effectively the existing or to establish new inter-state mechanisms of gas dispute resolution between Ukraine and the EU. This means in particular that the introduction of legal and financial responsibility between the EU and Ukraine at the international level for gas transit through Ukraine will not be in line with the fact that at the corporate level the liability (legal and financial) to the European partners for gas transit through Ukraine is placed on the Russian side (Gazprom).

It emanates from the above, that there is a need for the elaboration and establishment of a full-fledged and uniform legal regime that would provide for a quick, fair and legal settlement in the tripartite format of gas disputes and crises to which all three key actors in the European gas space (Russia, Ukraine and EU) would commit and that would, possibly, complete existing bilateral dispute settlement regimes.

## An Early Warning Mechanism Model in Relations between Russia and the EU

In spring 2009 the European Commission and Russia intensified discussions in their bilateral energy dialogue aimed at creating an early warning mechanism. On November 16, 2009 *Memorandum on an Early Warning Mechanism in the Energy Sector within the Framework of the EU-Russia Energy Dialogue* was signed in Moscow. The *Memorandum* foresees implementation of joint measures to prevent and respond quickly in the event of any likely situations of emergency in the energy sector, including disruptions of gas supply. According to the comments of the Russian Minister of Energy, who signed the *Memorandum* from the Russian side, "[Memorandum] establishes a formalized communication technology of the Russian Federation and the European Union to notify each other about possible risks, their concerns, and launches mechanism for coordinated actions."[35]

At the same time, the following facts, included in the *Memorandum, are important:*

- key measures provided by the *Memorandum* for prevention and rapid response on emergencies in the energy sector are: exchange of information (section 6), consultations (section 7) and monitoring (section 8).[36] The *Memorandum* does not provide for any more rigid and less dependent on the will and mutual consent measures, as for example jurisdictional measures;
- Ukraine was not invited in any form to take part at discussions, development and signing the *Memorandum* of November 16, 2009. Although the *Memorandum* in section 9 foresees possibility of third parties participation, but invitation of third parties to consultation and monitoring is only possible

[35] "Russia and the EU signed a Memorandum on an Early Warning Mechanism in the Energy Sector", News of Ministry of Energy of Russia Federation (November 16, 2009); http://minenergo.gov.ru/news/min_news/2341.html.

[36] "Memorandum on an Early Warning Mechanism in the Energy Sector within the Framework of the EU-Russia Energy Dialogue"; http://minenergo.gov.ru/upload/iblock/13f/13ff6b8370bc8a6d40692eabb97ffcbb.pdf.

in mutual agreement of the EU and Russia.[37] Thus, the position of transit countries may be considered and taken into account only if the gas supplier and buyer agreed so.

Detailed analysis of the *Memorandum* indicates the following.

1. Although Early Warning Mechanism (EWM) means early evaluation of potential problems as well as warning and rapid response in case of emergency (CoE), the actually proposed mechanism will work in retroactive but not preventive mode.
2. The proposed model of the EWM does not include the use of impartial control over energy flows. All information, which will circulate in the framework of the mechanism in CoE, is supposed to be received from the EWM sides – Coordinators, Representatives, Thematic Group, Expert Group, Special Monitoring Group etc. Information, based solely on 'human factor', could not be considered as uniquely correct because it could not be verified without the use of impartial control instruments.
3. The proposed EWM is quite unmanageable and difficult to organize. In CoE the Coordinators of the EU–Russia Energy Dialogue appoint relevant authorized persons (s.5.2.), which have to establish communication among them. In case of discrepancies in the assessment of the situation (they will arise definitely due to lack of reliable information that could be verified), the Parties have to hold consultations. To do it, one of the Coordinators should send an appropriate request. Consultations should be undertaken by the Expert Group of the EWM (s.7.2.) with the participation of persons, authorized by the Coordinator. If CoE arises, the Coordinators may create a Special Monitoring Group (s.8.1.), which will consist of representatives from both sides, including members of energy companies, international energy agencies and independent experts, agreed by both Parties. Effectiveness of such mechanism, described in the Memorandum, is questionable.
4. Realizing that the *Memorandum's* weak point is lack of a third Party (transit), which is an integral part of the technological gas trade chain, the Parties provided in section 9 for the possibility to involve it in consultations or monitoring. Such an approach in this bilateral document to a third transit party is discriminatory because it is not an equal participant and is not involved in the EWM process since its beginning.
5. The Memorandum is not an international agreement and does not create rights and obligations, regulated by an international law, which is fixed in

[37] Ibid.

section 13 of this document. It casts certain doubts on importance of this *Memorandum*.

Thus, a new mechanism at the EU – Russia level is only bilateral, not legally binding. The use of the foreseen warning and reaction measures completely depends on the will and mutual consent of both Parties. This mechanism will unlikely be able to prevent or resolve gas crises in trilateral format, similar to those, which took place in 2006 and 2009. Although the Memorandum emphasizes the need to strengthen the Early Warning Mechanism and to consider the participation of transit countries in it, the Memorandum does not contain provisions, which would determine the role and participation of transit countries and establish an effective trilateral dialogue in the chain 'Supplier – Transit Country – Buyer/Consumer'. Bilateral format of cooperation Russia – the EU ('Supplier – Buyer/Consumer') without involvement of Ukraine as a transit player (or rating a transit country as a secondary player in the bilateral dialogue between Russia and the EU) will undermine the credibility conducted within the framework of the Memorandum assessments of situations and necessary regulation measures, proposed in crisis situations. Energy security of Europe and Russia could not be achieved at the cost of transit country interests. Assessments and actions should be taken in accordance with the principles of transparency, proportionality and non-discrimination.

*Energy security of Europe and Russia could not be achieved at cost of transit country interests.*

Taking into account the above mentioned, it could be noted that Russia had established the EWM, which satisfied itself first of all. A good example for this was the end of 2009, when Russia firstly used the EWM in order to warn Brussels of possible oil transit suspension via Ukraine "due to unresolved issues on raw materials transportation"[38]. We should remember that in accordance with the principles of the ECT, it cannot be interpreted as cause for transit disruption. In this context (albeit on another issue – gas transit) former Deputy Secretary General of the ECT Secretariat A. Konoplyanik stated very clear: "Everyone should understand that the lack of a concluded contract is of no advantage to anyone. The consequences of failing to conclude a contract have only a negative effect on both parties."[39]

[38] "Russia Warned the EU about Possible Interruption of Oil Transit via Ukraine" (December 29, 2009); http://www.newsukraine.com.ua/news/153017/.

[39] A. Konoplyanik, "The Gas Transportation System of Ukraine and Russia has always been Unified", *Economicheskie Izvestiya,* No. 997(234) (December 24, 2008); http://eizvestia.com/state/full/43676.

The problem with oil transit through Ukraine in late 2009 was obviously fictional. In this way the Russian side tested the EWM. Brussels gave a response to the call of the Russian Vice-prime minister I. Sechin, which brought the EWM into operation. After activation the European Commission, which immediately warned governments of Central European countries about potential problems, Russia watched closely on actions of the 'object under investigation'. It is also interesting, that anything (despite promises to send immediately an appropriate letter, signed by the Minister of Energy) did not come from the Russian side to Brussels during the 'crisis period'. (As it become clear later, during the 'post crisis period' they also did not send anything, although Russian mass media reported about sending a letter to the European Commission).[40]

Brussels, Bratislava, Prague and Budapest needed additional information in order to verify the likelihood of oil disruption via the southern branch of Druzhba. It was clear from activities of Central European countries' diplomatic missions in Kyiv. Hence, the EWM showed immediately its main defect – the lack of objective information or possibility to verify information, received from an interested Party, through independent channels.

## Mechanism on the EU-Ukraine Level

Currently, there is very limited information on the development and parameters of new mechanisms of prevention and resolution of gas crises in the relations between Ukraine and the EU. In the same time, we can assume that such mechanisms are being discussed between Parties within the framework of the Association Agreement negotiations. It would be valuable if in the course of such discussions the Parties would take into account the following aspects:

- new mechanism of prevention and resolution of gas crises should ensure effective trilateral dialogue in the chain 'Russian supplier – Ukrainian transit – European Buyer /Consumer';
- mechanism of prevention and resolution of gas crises should be based first of all on the status of Ukraine as a transit country and not as a hydrocarbon supplier. This mechanism should be able to work even in the situation when reduction of hydrocarbon supplies to EU countries is caused not so much by

[40] S. Zakov, "In Expectation of Oil Transportation", *Rossiyskaya gazeta – Main issue,* No. 5077 (253) (December 30, 2009); http://www.rg.ru/2009/12/30/prokachka.html.

a Ukrainian party but by actions of a party, which is the primary supplier of hydrocarbons transited via the territory of Ukraine;

- responsibility (including financial) at the international level in relations between Ukraine and the EU regarding gas transit via Ukraine may be established only in the event that the Ukrainian party represented by the NJSC Naftogaz of Ukraine will become liable at the corporate level to European buyers for gas transit via the Ukrainian territory.

In other words, provided that the European Commission recommends and European companies as gas buyers agree, changes in the gas trade scheme should take place in order to establish that the Russian Gazprom transfers gas to European buyers on the eastern Ukrainian-Russian border and that contracts on gas transit via the territory of Ukraine from its Eastern border to the EU border are concluded between Naftogaz and European buyers.

It should be noted, that during Ukrainian-Spanish negotiations of the foreign ministers in Madrid, which took place on January 10-11, 2010, Petro Poroshenko raised the question of establishing an early warning mechanism of energy crisis in the trilateral format Russia – Ukraine – European Union. The Spanish Foreign Minister Miguel Moratinos as the representative of the state that took over the presidency of the EU since January 2010 took with interest this proposal and during his visit to Moscow on January 12, 2010 and negotiations with his Russian counterpart S. Lavrov raised the issue of establishing such a mechanism in the proposed format. According to available information, in general the Russian side reacted favorably on the proposal.[41])

In general, this idea corresponds to the three component principle of work of the entire technological chain 'Production – Transportation (transit) – Consumption'. Therefore it is reasonable that an early warning mechanism should cover all three components because if it covers only two the whole system will loose its integrity and efficiency.

It should be noted that Russian foreign minister S. Lavrov declared an already quite positive intention toward creation of such mechanism on a trilateral basis. This is evidenced by his position, expressed at the press conference in Brussels on October 19, 2009 after the meeting of the EU-Russia Permanent Partnership Council, "We are convinced that we should find a solution, including a so-called early warning scheme, early warning on a trilateral basis with the participation of the main producer, main transit player and main consumers. We are convinced, that the solution should be found taking into account the

[41] "Information Bulletin of the Working Group 3 of the Eastern Partnership Civil Society Forum", Coordinator Office, No.2 (February 2010), p.12.

balance of interests of all sides of this triangle."[42] However, it should be noted, that the position of the Russian foreign minister concerning energy issues is not determinative. The last word belongs always to pipeline monopolists, Gazprom and Transneft, and their curator Vice-Prime Minister I. Sechin.

## On a Possible Transnational Mechanism of Ensuring Transparency of Energy Flows

To prevent interruptions in energy supplies and use of energy infrastructure for 'energy wars' in the future, a system of confidence building measures should be initiated, similar to that provided for a military sphere in the 70-80s. Stability and security in Europe, the process of reducing military forces and weapons took place because the regime of confidence was established, which was based on information exchange, including sensitive data (size, structure of forces, types and kinds of equipment, dislocation). A communication network for rapid exchange of information was also established, related to the implementation of agreed confidence building measures. From the experience of implementation of the *Treaty on Conventional Armed Forces in Europe* and of monitoring how Parties maintained flank limits it is known that "exchange of information and reports provided enhancing of the transparency level"[43].

The weight of evidence suggests that proclamation and implementation of the Energy Transparency Regime (ERT), which will cover the whole technological chain from production to consumption, could become an effective mechanism for strengthening energy security on the European continent. This initiative should be based on the fundamental right to know. Consumers in each country (Russia, Ukraine, EU member countries) are entitled to know parameters of energy supplies, because they pay for them. Sectoral forms of this Regime should cover all energy flows – gas (ETR-gas), oil (ETR-oil), electricity (ETR-electricity).

Transparency of the chain 'Production – Transportation – Consumption' should properly create the regime of confidence; and mutual access to telemetric information on the parameters of physical movement of energy

[42] Shorthand report of speech and answers of the Minister of Foreign Affairs of Russia S. Lavrov on questions of mass media during joint press conference on the results of the EU-Russia Permanent Partnership Council plenary meeting on the foreign ministers level in Brussels (October 19, 2009).

[43] *SIPRI Yearbook 2007: Armament, Disarmament and International Security.* (Kyiv: Zapovit, 2008), p. 531; (translation from English).

flows would contribute to enhancing transparency. For the energy sector in general and the gas segment in particular it requires a special procedure, especially, because monopolistic structures work mainly in this sphere. Such a transparency system could become a mechanism for diagnostics and warnings about potential problems. During the gas crisis in January 2009 the biggest problem was the lack of objective information: "At the EU level, a major difficulty in assessing how best to respond to the crisis was the limited access to important technical information with respect to the gas system and gas flows at a national and an EU level. There was not enough reliable information about gas flows, how much gas was in the system, and demand patterns. This situation reflected on the fact that qualitatively different systems exist across Member States, with unequal access to information by market players and others, including public authorities. [...] the market was hampered by inadequate information on cross border gas flows and transparent information on the flow of gas into the EU." [44]

*Proclamation and implementation of the Energy Transparency Regime (ERT), which will cover the whole technological chain from production to consumption, could become an effective mechanism for strengthening energy security on the European continent.*

An appropriate online system for telemetric data monitoring should be installed, which would come from relevant gas-metering stations (GMS) by mutual agreement of the Parties. It would record in the daily mode mentioned in the Table 1 parameters, which apply only to quantitative volumes of gas flows. The list does not indicate commercial or financial figures. These parameters should be available for all parties of the technological chain 'Production – Transportation – Consumption' (Russia – Ukraine – the EU). Comparison of parameters would enable to identify problematic areas on the whole way of gas flows from wells to consumers and to find out who is responsible for traffic violations (see Figure 1).

[44] "The January 2009 Gas supply Disruption to the EU: an Assessment", Commission Staff Working Document. Accompanying document to the Proposal for a Regulation of the European Parliament and of the Council Concerning Measures to Safeguard Security of Gas Supply and Repealing Directive 2004/67/EC (Brussels, 2009), pp. 5-6, 10.

**Table 1.** List of Aggregated Parameters for On-line Monitoring in Daily Mode in terms of Gas Sector (ETR-gas)

| No. | Parameters | Upstream Producer/ Exporter | Midstream Transit Country | Downstream Importer/ Consumer |
|---|---|---|---|---|
| | Number of operating extracting wells | + | + | + |
| | Volume of daily gas extraction *mmcm/day* | + | + | + |
| | Actual real capacities of gas pipelines:<br>at the entry point<br>at the exit point<br>*mmcm/day* | <br>+<br>+ | <br>+<br>+ | <br>+ |
| | Actual free capacities:<br>at the entry point<br>at the exit point<br>*mmcm/day* | <br>+<br>+ | <br>+<br>+ | <br>+ |
| | Volume of out-coming gas from the territory of exporter<br>*mmcm/day* | + | | |
| | Volume of incoming gas on the territory of a transit country<br>*mmcm/day* | | + | |
| | Volume of gas, handed over on the border transit country - consumer<br>*mmcm/day* | | + | |
| | Volume of gas, which comes on the territory of the consumer:<br>for transit<br>not for transit<br>*mmcm/day* | | | <br>+<br>+ |
| | Working pressure at entry and exit GMS:<br>- daily average (P)<br>- daily dispersion (Pmax – Pmin)<br>*mmcm/day* | <br>+<br>+ | <br>+<br>+ | |

The ETR could become a test for the readiness of all participants in the technological chain to work on the rules of transparency. For Russia that always declares individual approaches, it also would comply at least with two principles, declared by the Russian President in his own draft of the Energy Charter:

- transparency in all segments of international energy markets (production/ export, transit, consumption/import);

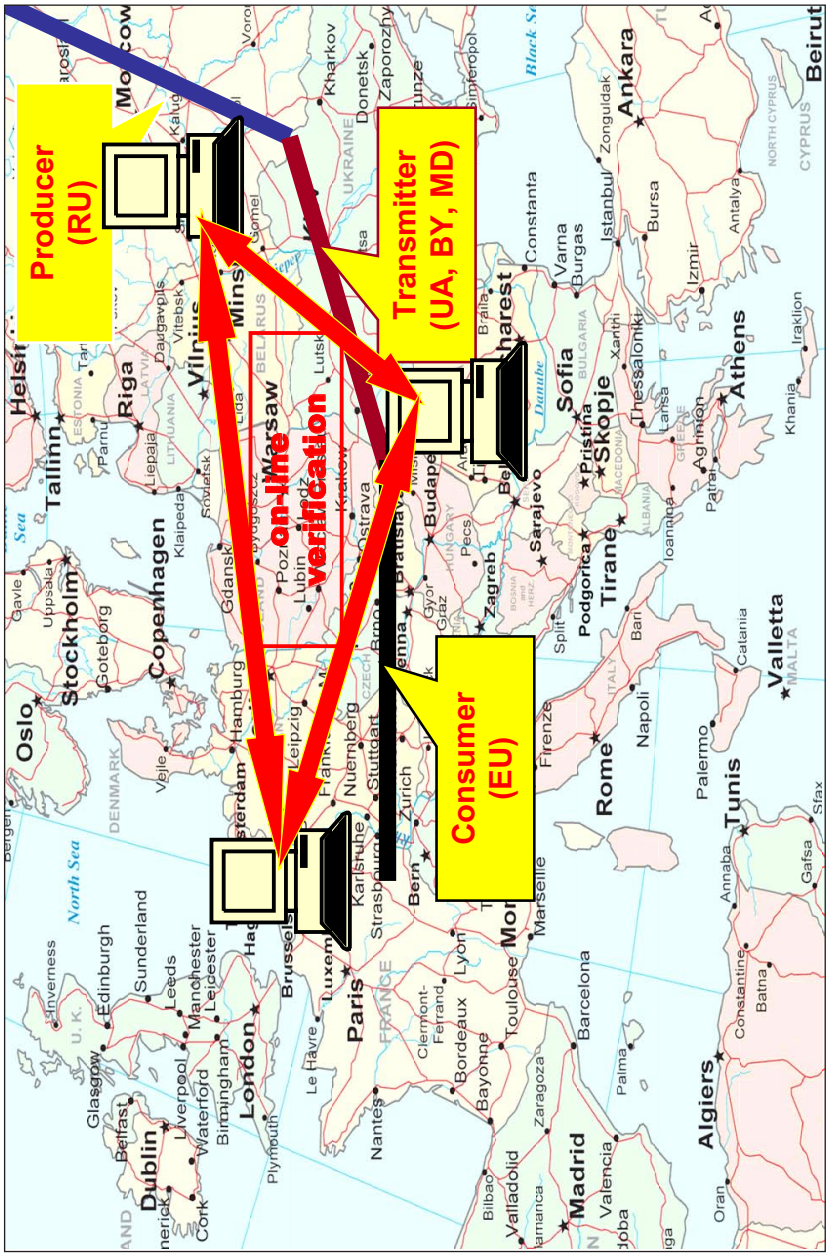



**Figure 1.** Approximated Scheme of the On-line Data Interchange System as a Base ETR Gas

- creation and improvement of early warning mechanisms with participation of suppliers, consumers and transit countries.[45]

Proclamation and implementation of the mentioned Initiative would meet the principles of the *European Energy Charter, the European Union's Second Gas Directive* No. 2003/55/EC of June 26, 2003, and in particular the principle of transparency in the gas market functioning, stipulated in these documents. It should be noted, that after the 2006 gas crisis the Energy Charter Secretariat worked out a mechanism for ensuring transparency in the framework of technological chains for energy transportation. In particular, this was emphasized by A. Konoplyanik who is quoted above: "In the fall of 2006, the Secretariat came out with a new initiative [...] to provide reasonably sufficient transparency of gas stream volumes at key points of the trans-border gas supply chains along their entire length within the ECT zone, extending to the East the practice of information openness existing in the EU within the framework of Gas Infrastructure Europe."[46] Unfortunately, this initiative has not acquired the pan-European character.

*Increase of pipeline infrastructure overcapacities has the potential threat for markets, especially those, which do not have diversified energy supply sources.*

In the summer of 2009 the ETR-gas proposal in the form of the European Gas Transparency Initiative was addressed by the group of Ukrainian non-governmental organizations to the European Commission and the ECT Secretariat.[47] The Initiative got support from the Eastern Partnership Civil Society Forum and was submitted to the EU on the meeting of foreign ministers in the format (27+6) on December 8, 2009 in Brussels.[48] Its actuality will increase over time as new pipeline projects will come into operation, focused on supply of Russian gas to EU markets.

---

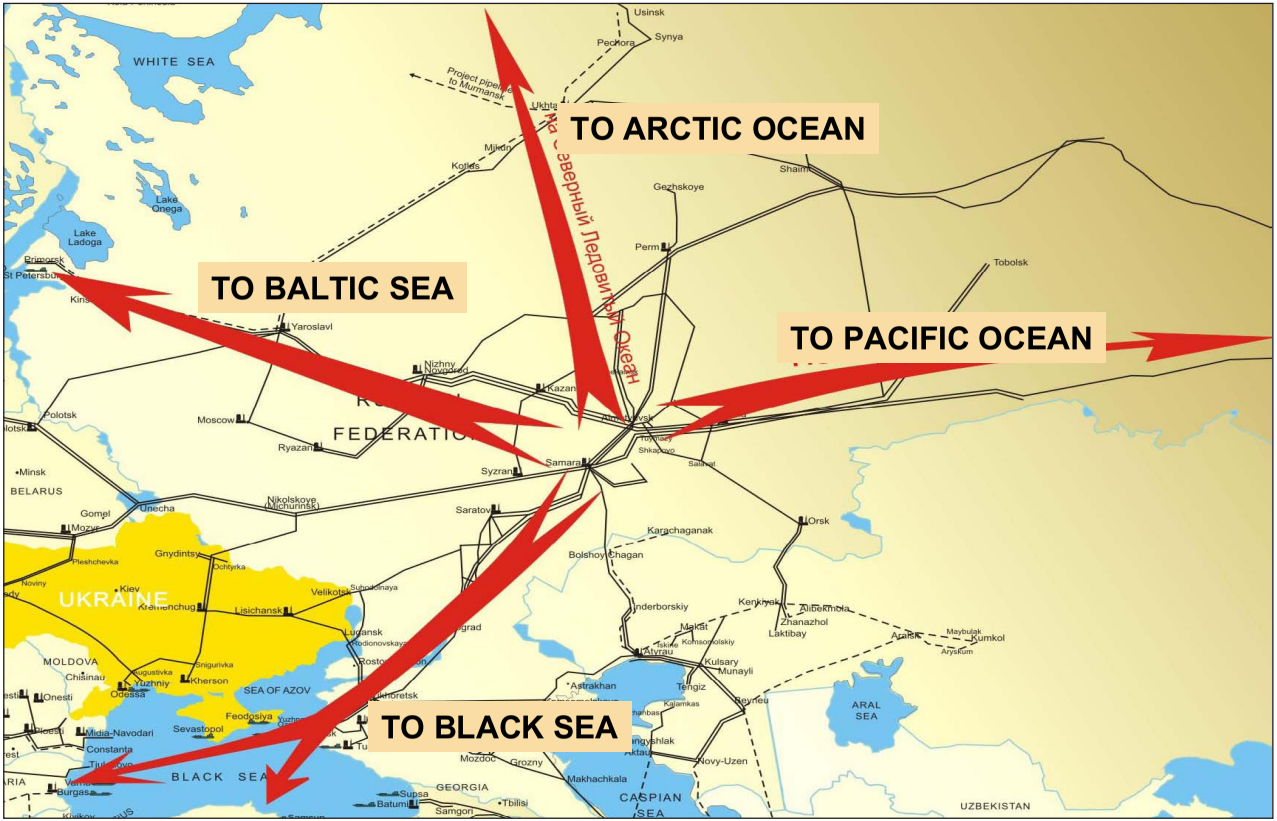
[45] "Conceptual Approach to the New Legal Basis of International Cooperation in the Energy Sector (the Goals and Principles)"; http://www.kremlin.ru/text/docs/2009/04/215303.shtml.

[46] A. Konoplyanik, "The Gas Transportation System of Ukraine and Russia has always been Unified", *Economicheskie Izvestiya,* No. 997(234) (December 24, 2008); http://eizvestia.com/state/full/43676.

[47] http://ua-energy.org/uploads/library/strategy/European_Initiative_of_gas_transparency.pdf; http://ua-energy.org/uploads/library/strategy/Letter_EIGT_for_EU.pdf.

[48] "Recommendations. Working Group 3: Environment, Climate Change and Energy Security", Eastern Partnership Civil Society Forum (Brussels, November 16-17, 2009); http://ec.europa.eu/external_relations/eastern/civil_society/forum/working_group3_en.pdf.

**Figure 2.** Strategic Challenges: Bypasses, Routes of Russian Oil & Gas Export (Development till 2030)



It should be noted, that an increase of pipeline infrastructure overcapacities has the potential threat for markets, especially those, which do not have diversified energy supply sources. The Russian energy strategy exactly foresees the rise of overcapacities due to energy export routes diversification policy, "the share of European direction in the whole volume of energy export will be on the downward trend at the expense of export diversification of energy markets in the East direction[49] [...] It also emphasizes the goal «to stimulate the build up of transportation infrastructure for diversification of sales markets and directions of Russian energy exports in the East, South, North-West and North of the country:[50] (See Figure 2)

If we take into account that the goal of the 1973 oil embargo, initiated by Arab countries, was reached by a 9% reduction of oil supplies[51], then the availability of significant overcapacities, which Russian pipeline monopolies seek (e.g., by Transneft it is expected to increase overcapacities in 2010 to 25%, and till 2015 – to 60%)[52], means possibility for proportional supply reduction. It means that transit flows will be unstable. In our last years research[53] we simulated through matrix analysis possible scenarios on the example of Ukraine and in most cases received exactly the scenario of transit flows instability, as seen from the resulting table below.

This will concern not only transit volumes via Ukraine, but also other routes, such as through Belarus. It could be concluded, that through building a diversified system of gas export Russia aims to manipulate with volumes, directions and prices of export supplies on the internally not integrated EU market to maximize revenues and to exert pressure on one or another EU or NATO Member State by the threat of reduction/disruption of deliveries, especially in combination with information and psychological campaign.

An American expert (Russian native) Mikhail Korchemkin from the East European Gas Analyses (USA) made similar conclusions: "Nord Stream gas pipeline will allow Gazprom to stop completely supplying gas to Poland and Belarus without damaging exports to other countries. Thus, Polish statements

---

[49] "Energy Strategy of the Russian Federation until 2030", p. 10; http://www.energystrategy.ru/projects/docs/ES-2030_(utv._N1715-p_13.11.09).doc.

[50] Ibid, p. 37.

[51] D. Yergin, *The Prize. World History of Struggle for Oil, Money and Power*. (Moscow: DeNovo, 1999), p. 648.

[52] "Transneft: Substantial Increase of Pipeline Network", Analytical department of the DOFR OJSC Bank Petrocommerce (February 19, 2007), p. 5.

[53] K. Liuhto (ed) *EU-Russia Gas Connection: Pipes, Politics and Problems.* p. 61; http://www.ua-energy.org/uploads/files/Liuhto.pdf.

**Table 2.** Simplified Matrix-Table of Scenarios' Variants for Changes of Transit Gas Supply Volumes via Pipelines from RF to EU through Ukraine

| **RF**<br>**EU** | 1. Production and export increase | 2. Production and export decrease | 3. LNG production development | 4. Shifting of export to APR (Asia-Pacific Region) |
|---|---|---|---|---|
| 1. Consumption and import increase | 1.1. Keeping of volumes with tendencies for increase | 1.2. Reduction of volumes close to critical | 1.3. Keeping of volumes with tendencies to non-critical reduction | 1.4. Keeping of volumes with tendencies to non-critical reduction |
| 2. Consumption and import decline | 2.1. Keeping of volumes with tendency to non-critical reduction | 2.2. Critical reduction of volumes | 2.3. Instability of transit volumes | 2.4. Instability of transit volumes |
| 3. LNG demand and supply growth | 3.1. Instability of transit volumes | 3.2. Instability of transit volumes | 3.3. Instability of transit volumes | 3.4. Instability of transit volumes |
| 4. Demand and supply growth for gas from non-RF sources | 4.1. Instability of transit volumes | 4.2. Instability of transit volumes | 4.3. Instability of transit volumes | 4.4. Instability of transit volumes |

that the Nord Stream project would endanger the energy security of the country are completely reasonable. On the background of the last years' events there is little doubt, that in case of a political dispute and availability of a bypassing pipeline Russia will stop gas delivery to Poland.

a. In the case of conflict with Bulgaria Gazprom would be able to stop gas delivery via the gas pipeline South Stream without reducing exports to other countries.
b. In the case of conflict with Germany Gazprom will be able to switch off Nord Stream pipelines, and it will not effect exports to other countries.
c. The Nord Stream and South Stream gas pipelines are planned not for an increase of Russian gas supplies and not for enhancing European energy security. The new projects of Gazprom will give Russia the possibility to selectively cut off gas deliveries to Belarus, Germany, Poland, Hungary, Romania, Bulgaria and Greece. Thus, energy security of these countries will decline."[54]

[54] M. Korchemkin, "Export Gas Pipelines Nord Stream and South Stream" (January 5, 2009); http://www.eegas.com/export_plans_ru.htm.

We should also pay attention to one of the provisions of the Energy Strategy of Russia, which calls for "reduction of risk of monodependance of Russian energy sector from energy exports to Europe, as well as an increase of profitability and efficiency of international activities of Russian energy companies without a substantial increase in exports of primary energy resources"[55](!)

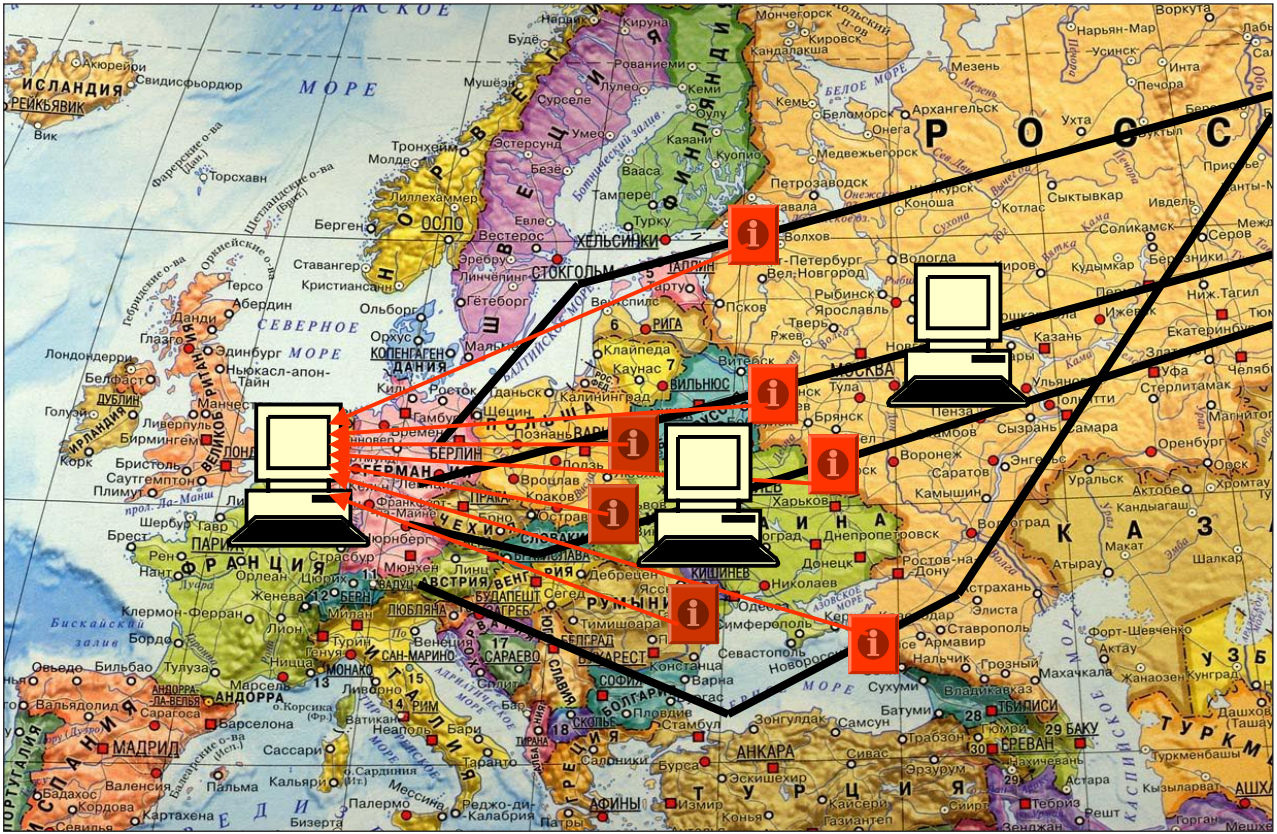
All that is mentioned above makes actual the need of implementation in a pan-European scale of transparency initiatives, in particular, the proposed ETR-gas. Moreover, to prevent the above described potential scenarios of manipulation, the telemetric information on figures 4-9 of the Table 1 should be available online from Russian GMS at the output points and GMS of transit countries for each and all export directions (See Figure 3).

Of course, the proposed system will be effective if physical disruptions of energy flows take place. But if there are some contractual misunderstandings or if a Supplier plans specially to cut off energy supply, this warning system will be effective only under the condition of contractual transparency. Because, if a Supplier starts to inform a Consumer about potential problems with transit, for example, in the framework of the existing EWM, analyzed above, a Consumer does not have any possibility to verify the accuracy of the information provided by a Supplier, as there is a lack of access to contracts between a Supplier and a Transit Country. Therefore, under similar circumstances, a Consumer should insist on the access to both warning information and a contract, which provisions, as estimated by a Party that activated EWM, could lead to supply interruption. The contract should be added to the EWM notification letter, or it could be done by a Transit Country within its relations with a Consumer if a Supplier rejects to ensure contractual transparency in the pre-crisis situation.

This is only a general description of the proposed system to minimize the likelihood of an energy crisis. Given the changes in global gas trade, which could be called tectonic, it seems that, as gas has become more and more a market good because of LNG, the threat of its inappropriate use declines. The sharp increase of non-conventional gas production in the USA and, consequently, growth of LNG supplies to European gas markets together with large-scale projects of LNG production in Qatar, may symbolize a first stage of reduction of dependence of pipeline gas supplies to Europe. However, this is nothing more than an illusion, at least, for the current decade, because infrastructure can be not transformed immediately of within a few years.

[55] "Energy Strategy of the Russian Federation until 2030", p. 11; http://www.energystrategy.ru/projects/docs/ES-2030_(utv._N1715-p_13.11.09).doc.

**Figure 3.** Approximated Scheme of the 'Anti-Manipulate' System based on Telemetring Data of Outcoming Gas Metering Stations



The large-scale pipeline system for gas supplies to Europe from the North Sea, Western Siberia and North Africa was built during the last quarter of the 20th century. This system is in most cases based on the suppliers' monopolism. And monopolists, interested in maximization of their revenues, including using non-market ways, will not so quickly give up their positions. The range of tools is very wide: from large-scale media campaigns to provocation of political tensions and armed conflicts in the regions of production and of critical transportation routes. Therefore, energy wars, both in terms of competition for energy resources and of using them as instruments of external influences, will not belong to the past. We should remember the reaction of Russia on the fall of oil prices in 2008. "Russia as one of the biggest oil and oil products producers and exporters cannot stay aside of pricing on this raw material, and we should develop a range of measures, which will allow us to influence actively on market trends", said V. Putin at a meeting with members of the government and oil producers in November 2008.[56] We can see how desperately Russia is trying to maintain oil-linked gas pricing, system of long-term contracts, demonstrates inflexibility of pricing policy during the fall in sales, while trying to implement large-scale pipeline projects and to buy gas distribution companies in the EU. In our opinion, it is caused by the intention to create, as above mentioned, a system for manipulation with volumes, directions and prices of supplies in the time, when the EU does not have an integrated gas network.

*Energy wars, both in terms of competition for energy resources and of using them as instruments of external influences, will not belong to the past.*

There may be a certain pause in gas relations on the line East-West, as it was after 1973, but in general the trend of energy wars will continue. These scenarios fit into the Horsnell's model, which describes three possible options for interruption of energy supplies: 'force majeure interruption' (failure of the producer to provide export supplies because of internal or external circumstances, such as military actions), 'export limitation' (producer or producers' cartel stop or reduce exports because of non-economic motives), 'embargo on imports' (consumer blocks energy purchases from certain

[56] "Russia Develops Measures to Influence Global Oil Pricing", *RIA Novosti* (November 10, 2009); http://www.rian.ru/crisis_news/20081110/154775663.html.

producers).[57] Thus, the potential of inappropriate use of energy and its transportation infrastructure, especially through the scenario of 'export limitation', will be maintained, although sometimes it seems that a period of energy wars is over, just as in the 90-s scenarios of 'gas wars' of 2006 or 2009 were considered as totally unrealistic.

Therefore, in our opinion, creation of a confidence building system in a multilateral format, that would introduce necessary transparency regimes, could become a combined safety lock, which will minimize intensions of some authoritarian regimes to use energy and energy transportation infrastructure in an inappropriate way. Moreover, such transparency regimes will be successful if it is complemented by means of objective control. We agree with the opinion of Kamila Proninska: "Today it is clear that some aspects of energy security, which were traditionally regarded as exclusively national or domestic issues, will be better solved collectively or on a multilateral basis."[58] The success of the proposed initiatives to implement transparency mechanisms depends on to which extent European EU and NATO Member States could speak in one voice and resist the dictate of a monopolist, who prefers bilateral and avoids multilateral formats.

*Creation of a confidence building system in a multilateral format, that would introduce necessary transparency regimes, could become a combined safety lock, which will minimize intensions of some authoritarian regimes to use energy and energy transportation infrastructure in an inappropriate way.*

## Conclusions

1. Consequences of gas crises in Europe can be substantially compared with consequences of the 1973 Arab oil embargo, the Caribbean missile crisis and Middle East conflicts in the military-political sphere during the Cold War.

[57] P. Horsnell, "The Probability of Oil Market Disruption: With an Emphasis on the Middle East", James Baker Institute for Public Policy (May 2000), p. 7; http://www.rice.edu/energy/publications/docs/JES_ProbabilityOilMarketDisruption.pdf.

[58] *SIPRI Yearbook 2007: Armament, Disarmament and International Security*. (Kyiv: Zapovit, 2008), p. 244; (translation from English).

Therefore, our continent needs to develop a confidence building system as it was in the military sphere in the 70-80s of the last century.

2. Provisions of some legislative acts of Russia (*National Security Strategy of the Russian Federation until 2020, Military Doctrine, Energy Strategy of Russia until 2030) contain ambiguous provisions and does not promote confidence to Russia as a predictable partner*:
3. In Russian legislative acts like National Security Strategy of the Russian Federation until 2020 and Military Doctrine of the Russian Federation the NATO enlargement process and execution of global functions by NATO are not welcomed and, therefore, the task of deterrence is formulated through "neutralization of possible military dangers and threats by virtue of political, diplomatic and other non-military means". This raises the probability of the use of energy and infrastructure capabilities of Russia as a means of non-military deterrence in the case of deterioration relations both with individual countries and with the whole of NATO.
4. Until now there is no formal and unified assessment by the EU side for the 2009 gas crisis. It is still officially undetermined if Russia cut off gas supplies to the EU or Ukraine disrupted transit. Both the 2006 and 2009 gas crises failed to be prevented neither by political nor by legal means. The crises were resolved by political means. The achieved settlements did not have a complex nature and can be regarded as a kind of an ad hoc settlement.
5. The end consumers, national governments of consuming countries and the European Commission did not have complete information of the crisis progress based on data of instrumental monitoring, as an integrated system of the objective monitoring of gas flows does not exist at all. Informational space in case of lack of objective information is filled with informational surrogate and false information.
6. Large-scale and expensive projects to diversify gas export routes, initiated by Russia on the background of the tendency to decrease gas imports from the East, could create pipeline overcapacities. Given the lack of integrated gas infrastructure in the EU, it makes possible the threat of manipulations with volumes, directions and gas export prices aimed to maximize revenues of the Russian monopolist. In the event of sharp aggravation of relations between Russia and NATO or between Russia and one (or group) of NATO members such manipulations can serve as a tool to exert simultaneous and heterogeneous pressure by the projection of the threat of supply reduction/disruption in combination with information and psychological campaign.
7. Memorandum on an Early Warning Mechanism on the Russia – European Commission level is only bilateral, not legally binding and the use of its warning and reaction measures completely depends on the will and mutual

consent of both Parties. This mechanism is hardly able to prevent or resolve gas crises in a trilateral format, similar to those, which took place in 2006 and 2009. Energy security of Europe and Russia could not be achieved at the cost of transit country interests. Assessments and actions should be taken in accordance with the principles of transparency, proportionality and non-discrimination.

8. An effective mechanism for strengthening energy security on the European continent could be achieved through initiation and implementation of the Energy Transparency Regime, which will cover the whole technological chain from production to consumption. Sectoral forms of this Regime should cover all energy flows – gas (ETR-gas), oil (ETR-oil), electricity (ETR-electricity). Transparency of the chain 'Production – Transportation – Consumption' should properly create the regime of confidence, and mutual access to telemetric information on the parameters of physical movement of energy flows would contribute to enhancing transparency.
9. NATO and the European Commission should intensify cooperation in the energy security sphere, because its problems are one of the critical components of the European NATO and EU members. We should understand problems of energy security not only through the prism of commercial disputes between business entities, but also through the prism of using energy and energy transportation infrastructure as instruments of political influence, to which use the countries with authoritarian regimes tend in order to implement their strategic goals of non-economic nature.

The idea that a creation of a Russian-Ukrainian consortium to manage Ukrainian Gas Transportation System (GTS) is a solution of all problems with Siberian gas supplies to the EU is a wrong one. It is also a mistake to believe, that after the handing over of 50% of the Belarusian operator Beltransgaz to Russian Gazprom, this transit route will be safe and events with supplies interruption of 2004 will not happen again. Unfortunately, the forecasts here are rather unoptimistic and we have tried to show it in this article. As for Europeans, the functioning of both Ukrainian and Belarusian GTSs in case of incorporation by the Russian monopolist management will be not more transparent than the functioning of Gazprom itself. And thoughts that the Russian monopoly will become more responsible are illusions. Gazprom has already had the whole liability and obligation vis- -vis its European partners to ensure uninterrupted gas supplies under the effective long-term contracts. Nevertheless, the gas supplies in January 2009 were interrupted not only to Ukraine, but also to the EU. In order to minimize in the future inefficient search for reasons and guilty parties in the event of emergencies in energy supply networks, in our opinion, both a symmetric and nondiscriminatory contractual and legal ensuring of transparency and objective

control through instrumental tools of energy flows physical parameters exactly in the trilateral format should be introduced, which corresponds to the logic of energy sector functioning 'Upstream – Midstream – Downstream'.

## References

"Bucharest Summit Declaration" (April 3, 2008); http://www.nato.int/cps/en/natolive/official_texts_8443.htm.

"Concept of Russia's Energy Strategy for the Period till 2030" (Moscow: Ministry of Industry and Energy of Russia, Institute of Energy Strategy, 2007).

"Conceptual Approach to the New Legal Framework for Energy Cooperation (Goals and Principles)" (April 21, 2009); http://www.kremlin.ru/text/docs/2009/04/215303.shtml.

"Energy Strategy of the Russian Federation until 2020"; http://www.energystrategy.ru/projects/ES-28_08_2003.pdf.

"Energy Strategy of the Russian Federation until 2030"; http://www.energystrategy.ru/projects/docs/ES-2030_(utv._N1715-p_13.11.09).doc.

"EU Commission will not Apply European Charter Provisions against Ukraine"; http://novynar.com.ua/business/49966.

Gutkin, M. "Russia-Ukraine Gas Dispute: Lawyer's Comments" (January 15, 2009); http://www.voanews.com/russian/mobile/displaystory.cfm?id=193754.

Horsnell, P., "The Probability of Oil Market Disruption: With an Emphasis on the Middle East", James Baker Institute for Public Policy (May 2000); http://www.rice.edu/energy/publications/docs/JES_ProbabilityOilMarketDisruption.pdf.

Konoplyanik, A., "The Gas Transportation System of Ukraine and Russia has always been Unified", *Economicheskie Izvestiya,* No. 997(234) (December 24, 2008); http://eizvestia.com/state/full/43676.

Korchemkin, M., "Export Gas Pipelines Nord Stream and South Stream" (January 5, 2009); http://www.eegas.com/export_plans_ru.htm.

"Memorandum on an Early Warning Mechanism in the Energy Sector within the Framework of the EU-Russia Energy Dialogue"; http://minenergo.gov.ru/upload/iblock/13f/13ff6b8370bc8a6d40692eabb97ffcbb.pdf.

"National Security Strategy of Russia Federation until 2020"; http://www.scrf.gov.ru/documents/99.html.

"New Military Doctrine of Russian Federation is almost Ready" (October 8, 2009); http://www.prime-tass.ru/news/articles/-201/%7B66F6FF60-4642-4E42-9702-A9A3EF36C5EF%7D.uif/.

"Military Doctrine of Russia"; http://www.scrf.gov.ru/documents/33.html.

"Russia Develops Measures to Influence Global Oil Pricing", *RIA Novosti* (November 10, 2009); http://www.rian.ru/crisis_news/20081110/154775663.html.

"Russia and the EU signed a Memorandum on an Early Warning Mechanism in the Energy Sector", News of Ministry of Energy of Russia Federation (November 16, 2009); http://minenergo.gov.ru/news/min_news/2341.html.

"Russia Warned the EU about Possible Interruption of Oil Transit via Ukraine" (December 29, 2009); http://www.newsukraine.com.ua/news/153017/.

"Russia will also Appeal to the Court" (January 14, 2009); http://www.newsru.com/finance/14jan2009/papageorgiu.html.

*SIPRI Yearbook 2007: Armament, Disarmament and International Security.* (Kyiv: Zapovit, 2008); (translation from English).

"The Energy Charter Treaty and Related Documents"; http://www.encharter.org/fileadmin/user_upload/document/EN.pdf.

"The January 2009 Gas supply Disruption to the EU: an Assessment", Commission Staff Working Document. Accompanying document to the Proposal for a Regulation of the European Parliament and of the Council Concerning Measures to Safeguard Security of Gas Supply and Repealing Directive 2004/67/EC (Brussels, 2009).

Yazyev, V., "Russia Lost Information War in Europe during Gas Conflict with Ukraine", *Oil of Russia* (April 14, 2009); http://www.gazo.ru/images/upload/ru/1555/GL_15.04.2009.doc.

Yergin, D. *The Prize. World History of Struggle for Oil, Money and Power.* (Moscow: DeNovo, 1999).

*Zakov, S.,* "In Expectation of Oil Transportation*", Rossiyskaya gazeta – Main issue,* No. 5077 (253) (December 30, 2009); http://www.rg.ru/2009/12/30/prokachka.html.

Ján Klepáč

# Security of Natural Gas Supply in Central Europe. Case Study: Slovakia

*Abstract: The January 2009 gas crisis resulted from an unresolved commercial dispute between Naftogaz (Ukraine) and Gazprom (Russia). It is not the first time that gas supplies to the EU have been disrupted. Tensions between Russia and Ukraine and Russia and Belarus have been raised several times since the split up of the Soviet Union due to continuing difficulties to agree on the details of a new gas transit and supply regime. This paper is not focused on analyzing the reasons and connections of relations of the post-Soviet area. It is more important that a new gas supply disruption could happen at any time This is because debts of Ukraine for gas for the preceding month are paid off to Russia on the seventh of each month, a month early in fact..*

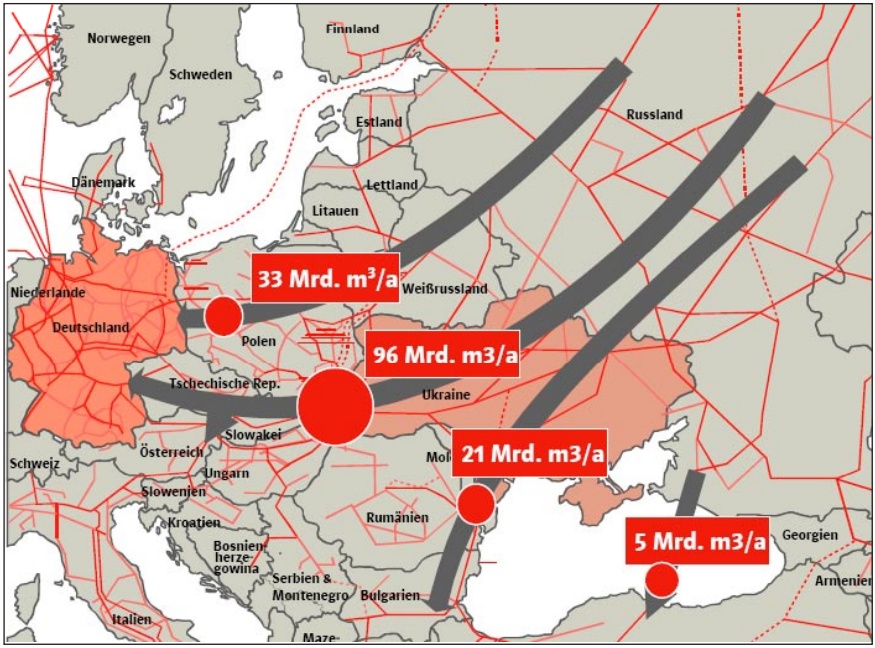
From January 6-20, 2009, gas flows were interrupted from Russia to the EU via Ukraine. 30% of Europe's imports were cut off for two weeks. One quarter of all energy consumed in the EU is gas. 58% of this gas is imported. Of this, 42% comes from Russia and around 76% of EU imports of gas from Russia pass via Ukraine (see Figure 1). Some 300-350mcm per day of gas passes through Ukraine towards the EU, around one fifth of total gas demand in the EU.

The January 2009 gas crisis resulted from an unresolved commercial dispute between Naftogaz (Ukraine) and Gazprom (Russia). January 2009 is not the first time that gas supplies to the EU have been disrupted. Tensions between Russia and Ukraine and Russia and Belarus have been raised several

***Ján Klepáč*** *is an Executive Director of the Slovak Gas and Oil Association.*

Klepáč, J., "Security of Natural Gas Supply in Central Europe. Case study: Slovakia", *International Issues & Slovak Foreign Policy Affairs* Vol. XIX, No. 1|2010, pp. 45-60.

**Figure 1.** 76% of the Exports are Transported via the Ukraine System




Source: E.ON Ruhrgas AG

times since the split up of the Soviet Union due to continuing difficulties to agree on the details of a new gas transit and supply regime.

This paper is not focused on analyzing the reasons and connections of relations of the post-Soviet area. It is more important that a new gas supply disruption could happen at any time. This is because debts of Ukraine for gas for the preceding month are paid off to Russia on the seventh of each month, a month early in fact.

## Lessons Learned

The gas supply disruption lasted a total of 14 days. Theoretically, the shortfall (300mcm per day) could have been fully compensated by increased imports from alternative sources and withdrawal from gas storage (available spare storage withdrawal capacities at EU level of around 800mcm per day). But

the crisis in January 2009 demonstrated the lack of interconnections and diversification options, the inadequate possibilities for reverse flows, the limits to fuel switching and insufficient integration of gas networks in Central and South Eastern Europe. The most seriously affected Bulgaria and Slovakia had no other import option, no other gas supply option and no option to increase domestic gas supply. Since there were no strategic gas reserves in Slovakia, the country mainly used its commercial gas stock. The similar situation could also be seen elsewhere in Europe. Gas Storage Europe, which represents 28 storage system operators in seventeen European countries, said all gas withdrawn during the crisis to meet demand was taken out of commercial gas stocks and not from strategic gas reserves.

On January 18th, Slovakia together with the Czech TSO RWE Transgas reversed the gas flow on the main East-West transit pipeline for the first time in history. Reverse flow was recognized as a potentially powerful tool for mitigating the effects of disruption to supply. However, more investments in the relevant infrastructure are needed to ensure that this possibility exists across the EU's internal market.

*The January 2009 gas crisis confirmed that the EU needs to diversify its supplies in terms of supply source, supplier, transit route and fuel form.*

The crisis confirmed that the EU needs to diversify its supplies in terms of supply source, supplier, transit route and fuel form (natural gas or LNG). A more interconnected market, more flexibility in gas transport and more fuel-switching options can also help mitigate the risks of a significant reliance of a single supplier. Greater coordination among TSO's and better coordination of access to pipeline networks could also have ensured that the available gas flowed to the affected areas. The new proposed regulation emphasizes that the primary responsibility for the gas security measures would lie with market participants using existing market mechanisms, such as commercial gas storage, greater coordination of existing gas flows, and increased import flexibility. Member states should only resort to non-market measures – including strategic storage reserves, and forced fuel switching – when the market is unable to cope with the supply disruption.

Following the January crisis, Slovakia chose the strategic storage option and passed legislation giving the government greater control over its stored gas volumes. The law requires gas monopoly SPP to keep gas reserves covering 30 days of average consumption between October and March and also gave the government the right to ban gas exports in the event of severe supply disruption.

SPP criticized the legislation, saying it would not achieve its aim of guaranteeing gas supply security.

In case of potential cut-off of gas supplies from the Russian Federation, SPP is ready to secure reliable gas supplies to Slovakia, thanks to realization of the following measures:

- diversified portfolio of resources (Gazpromexport, E.ON Ruhrgas, GdF SUEZ, VNG);
- technical preparation (immediate launch of reverse flow within two or three hours);
- sufficient gas stock (as of beginning of July 2009, SPP core group companies secured and pressed the gas supplies in UGS which represent the standard volume that SPP usually had in the past at its disposal only before the start of the winter season).

## Dimensions of the Security of Gas Supply

The discussion about EU energy security has changed in the new millennium. We have moved from the government–centered system to a market-based system. We are moving from a national energy market towards the EU energy market. Energy markets have become more international, the EU has doubled the number of its Member States and environmental concerns have been recognized. That's why the European security of supply has been raised to the EU agenda in recent years.

Currently, there is no legal definition of security of supply within the European community. Security of supply is a multi–dimensional phenomenon with many different aspects. There are various attempts to conceptualize the security of supply. These include:

"The conditions under which a country and its citizens (or at least most of them) and companies have access to sufficient energy resources at reasonable prices for the foreseeable future without a serious risk of major disruption of service."[1]

"The ability of energy industries, primarily in electricity and gas, to provide their services throughout the EU to a high standard and at a reasonable cost in a competitive, fully liberalized pan-European market."[2]

---

[1] B. Barton, C. Redgwell, A. Ronne, D. Zillman (eds) Energy Security – Managing Risk in a Dynamic Legal and Regulatory Environment. (New York: Oxford University Press, 2004), pp. 4-5.

[2] P. Cameron *Competition in Energy Markets – Law and Regulation in the European Union.* (New York: Oxford University Press, 2007), p. 518.

"The steady availability of energy supplies in a way that ensures economic growth in both producing and consuming countries with the lowest social cost and the least price volatility."[3]

Compared with the EU oriented definitions, Alhajji`s definition is more global. Various definitions usually combine issues of continuing availability, low or affordable prices and system integrity.

The author will not discuss every possible supply risk for the European Union and Slovakia, for they were already discussed in many high-quality monographs and papers. These risks are usually divided into external or source-related threats (reserve depletion, investment in gas fields, insufficient diversification and international competition over gas resources) and internal or EU-related threats (environmental protection, investment in gas infrastructure, market liberalization and contractual regimes). It is also clear that the discussion about the energy security is highly exposed to short and long-term trends.

*Energy markets have become more international, the EU has doubled the number of its Member States and environmental concerns have been recognized. That's why the European security of supply has been raised to the EU agenda in recent years.*

The author has found that, by studying various materials, the threats to the security of supply could mean different things to different people. These are the so-called dimensions of the security of supply. Table 1 describes different types of concern that may exist around the security of supply. Columns relate to different types of threats and concerns:

- *Operational Concern* means "will there be enough gas in the system to keep me warm on a cold winter day?" or "does our infrastructure have sufficient capacity and integrity to ensure secure supply under different weather conditions?" or "what to do if there is an operational failure in the system or a serious interruption of supply?";
- *Strategic Concern* or in other words "how to deal with risk of a serious interruption in supply of gas from one source to Slovakia or Central Europe?" or "how to deal with the risk of a serious loss of critical infrastructure?";

[3] A.F. Alhajji, "What Is Energy Security? (5/5)", *Middle East Economic Survey* Vol. LI, No. 2 (2008).

**Table 1.** Dimensions of the Security of Gas Supply

| | **Operational** | **Strategic** | **Long-term** |
|---|---|---|---|
| **Capacity** | capacity to transport gas to meet defined peak daily demand | network supply capacity sufficient to meet peak firm demand in the event of defined loss of infrastructure | network expansion designed to met the anticipated demand growth |
| **Supply** | supply available to meet both the defined peak daily demand and to supply during a severe period/winter | ability to meet firm demand in the event of severe disruption to the principal supply source | supply available to cover the future projected demand |

- *Long-term Concern* means concern about the long-term availability of "how to ensure sufficient gas supplies and infrastructure to meet the Slovak demand in 2020".

Each of these three different concerns has different strategic options. This paper considers different potential options that may either reduce the risk or its impact. The text will examine the concern and solutions from the point of view of Slovakia.

## Recommendations

Now it is a time to raise the question: "What should Slovakia do in order to improve its natural gas supply portfolio and increase the security of supply?"

The January gas crisis, that for the first time in history left Slovakia for several days without Russian gas, has underlined the necessity of concentration on more flexible, effective and faster solutions to increase energy security. Slovakia is not able to markedly influence financially and time demanding extensive gas industry projects with its economic and political power. In this part, the author tries to formulate a concise and clear statement concerning the strategy that should be implemented by the Slovak government. Therefore, it is convenient to divide the recommendations in accordance with dimensions of the security of gas supply into *Operational SoS*, *Long-term SoS* and *Strategic SoS* relating to the ability to deal with a crisis.

***Operational SoS Recommendations***

1. Slovakia should not resign from the development of new underground storage facilities. The January crisis showed that the higher the commercial gas stocks in a state are, the less it is necessary to use strategic gas stocks. The state should not make direct investments however, it should support private investors. But to stimulate investment in new commercial gas storage, an appropriate regulatory framework needs to be implemented. Access to storage should be unregulated to encourage competition. Insufficient seasonal storage may lead to temporary gas shortages, high gas price volatility and a larger exposure to security of supply risks. Having sufficient seasonal storage facilities would put Europe in a better position for ensuring the supplies from outside of Europe. Namely, Slovaks can use their own deposit structures or co-operate on an international basis with Austria and the Czech Republic in the locality of the Viennese basin. The *SoS* level will increase not only in these countries but also in the whole Europe.

In this time in Slovakia there is a complex of underground natural gas storage facilities located in Láb in Western Slovakia, with the total storage capacity of 2.75bcm (see Figure 2).

The workers of Nafta a.s. examined construction possibilities of additional storage capacities in the Slovak territory based on geological research. The conversion of oil-gas reservoirs to underground storage facilities is considered as a main option. There have been 3 areas chosen (see Figure 3):

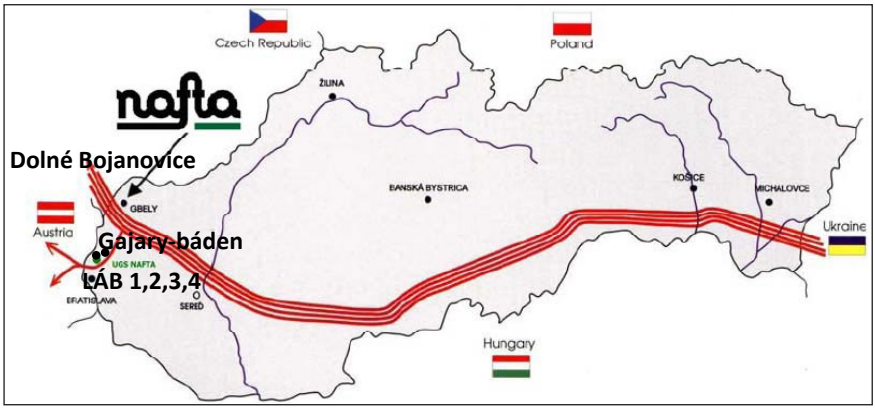
- close to the area of underground storage facilities Láb (object Gajary – Baden, object Láb 5);
- close to the area of the town Sereď in Western Slovakia;
- in the field of East-Slovak Neogene, especially the location of Ptrukša in Eastern Slovakia

2. It is necessary to pay systematic attention to the legislative and organizational measures for further opening of the gas market. The free and competitive market is the best way for ensuring the reliable natural gas supply. The possibilities of the establishment of a gas trade-logistic centre HUB in Veľké Kapušany should be also examined.

***Long-term SoS Recommendations***

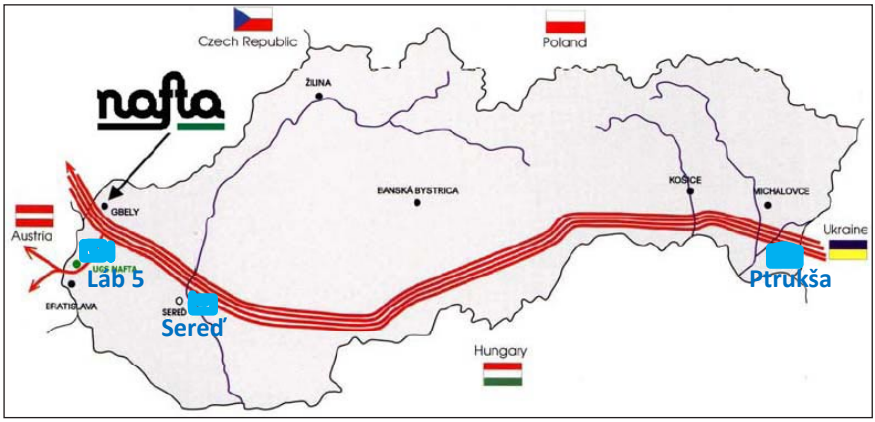
1. The Slovak natural gas consumption, in respect to diversification projects is relatively low. The simplest and cheapest solution is the conclusion of the long-term contracts with the existing suppliers at reasonable prices. This strategic option has been applied by the Slovak Republic. Incumbent trader SPP, a.s. concluded a 20-year contract with Gazpromexport in November 2008, a 10-year contract for gas supply with E.ON Ruhrgas in June 2009 and a contract

**Figure 2.** Location of the UGS in Slovakia – Current Situation




Source: Nafta, a.s.

**Figure 3.** New UGS Projects




Source: Nafta, a.s. and author

with GdF SUEZ is under preparation. All these steps have been taken in the right way and they demonstrate that Slovakia has learnt from the January gas crisis. This strategic option is the last resort if the other options are not completely or partially realized. The long term contracts shall be taken as a tool

to guarantee that a certain amount of gas will come to the market. In a world of tight supply/demand tension long term supply contracts in the sense of the Directive 2004/67/EC grant guaranteed volumes of gas with a predictable price calculation method, with less risk of volatility.

2. However, Slovakia should not resign from the diversification projects[4]:

- pipeline project (Nabucco), see Figure 4
- LNG terminals (Adria Project – Croatia, Baltic Sea Project – Poland)
- HUB and Norwegian natural gas

In November 2008, OMV, Gazprom and the Vienna Stock Exchange agreed to jointly develop the Central European Gas Hub and establish a gas exchange. The main advantage of this HUB is a large number of the destinations supplied with the gas flowing through Baumgarten (see Fig. No.5). The main gas destination is Italy. The trading point can be also potentially used by Slovak traders and customers. The problem is that Russian gas dominates in Baumgarten. Therefore, not enough market players will be prepared to use the HUB because subsequently Gazprom and its affiliates dominate the Russian gas sales. They might fear that Gazprom could manipulate the price and the development of the hub could be endangered.

All the continental European hubs face the same problems: the national market players dominate everywhere, except for TTF in the Netherlands. Therefore, not enough players trust the prices. If they do not participate, the liquidity will not develop.

The question is in which way Slovakia could join in the realization of such a project. The Slovak state holds a 51% share in the SPP a.s. (Slovak incumbent) and roughly 30% share in the Nafta a.s. (Slovak system storage operator). Neither SPP nor Nafta are involved in Nabucco or the LNG projects. However, both could benefit from their implementation. For example, SPP could be prepared to support one or more of these projects by signing a long-term take or pay gas purchase agreement that would support the external debt financing. Even though now after having signed the long-term contracts with Gazpromexport and E.ON Ruhrgas, it is hardly imaginable. Another possibility is to think about is the UGS project by Nafta as an integral part of the North-South gas pipeline project or the Nabucco project. However, Slovakia should enter or invest in such a project only after having taken the supply arrangements under acceptable conditions.

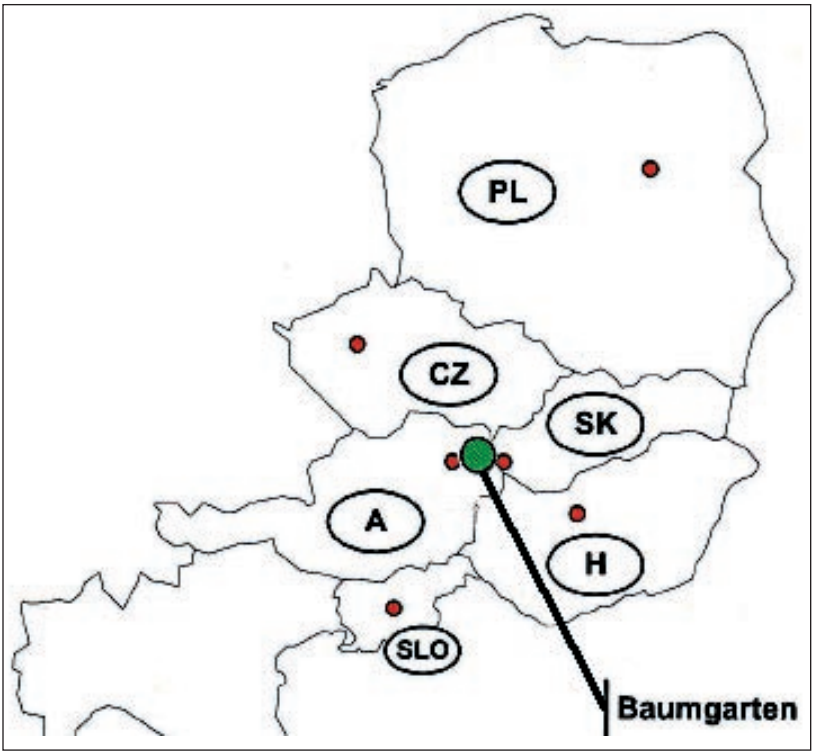
---

[4] The author described the Nabucco project and LNG terminals two years ago in his article "How to Enhance Security of Natural Gas Supply in Slovakia", *International Issues & Slovak Foreign Policy Affairs Vol. XVI, No. 4/2007, pp. 8-22.*

**Figure 4.** Existing/Possible Supply Routes to Nabucco Gas Pipeline


Source: Nabucco Gas Pipeline International GmbH

**Figure 5.** HUB Baumgarten Project




Source: Author

Simultaneously, we have to remember that natural gas prices from diversified localities can be higher than current gas prices in Slovakia. Even if the gas company with the majority state interest did not directly join the consortium Nabucco, the negotiations in the EU structures related to its construction should be supported by Slovakia as a matter of principle. It does not only mean the act of solidarity but also responsibility for its own safety of energy.

3. Diversification of the supplies by import of Norwegian natural gas despite the higher purchase price through the territory of the Czech Republic.
4. Focusing more on reducing the energy use may be more cost efficient for the EU and also for Slovakia than focusing on developing and promoting alternative and renewable energy sources.

***Strategic SoS Recommendations***

1. Construction of the North–South interconnection pipelines (see Figure 6).

There is no gas interconnection in the countries of the Central European region. In case of any problems, no solidarity can be applied. The gas trade is a long-term business. Current strategic decisions will bring the results in 10 years – therefore it is necessary to work with a minimum ten-year vision. In the case of planned LNG use, the inland countries face the necessity of the construction of interconnection gas pipelines. The Slovak transit system has been constructed in the east-west direction. There have been no North (Poland) – South (Hungary) connections built so far. The future LNG terminals in Croatia and Poland enable us to also think about the construction of the gas pipelines in the north-south direction.

The problem during the January gas crisis was not that there was not enough gas to go round but that the gas could not get to where it was most needed. In the case of Slovakia, construction of the North-South interconnection pipelines stands in good stead:

- Interconnector with Poland would enable the connection to the Yamal gas pipeline and later to the LNG terminal at the Baltic Sea.
- Interconnector with Hungary would enable the connection to the Hungarian gas industry network with the underground storage facilities of the capacity of 3.5bcm and later to the LNG terminal at the Adriatic Sea.

In September 2007, the representatives of the Czech RWE Transgas Net published the intention of constructing the interconnection gas pipeline between the Polish gas pipeline JAMAL and the Czech transit gas pipelines, with further continuation to the Central European HUB Baumgarten on the Austrian-Slovak border. The total length of the gas pipeline should amount to 690 km with a pipeline of 700 mm in diameter and a capacity of 10bcm a year. The estimated investment costs amount to EUR 510 million.

The representative of the Polish incumbent PGNiG declared the intention of the company to build a new gas line through the territory of Slovakia and join the Polish gas infrastructure with the HUB in Baumgarten in March 2009.

The largest carrier of Russian natural gas in the EU, Slovak Eustream, a.s., signed a Memorandum of Understanding with the Hungarian gas transmission company FGSZ Zrt. in June 2009. The main goal of the co-operation is to analyze possibilities of connecting the Slovak and Hungarian gas transmission systems. According to Eustream's expectations, the project could be implemented within a period of three years. The planned 120 km long pipeline would connect Velky Krtis on the Slovak side with Vecses in Hungary.

The project of interconnecting Slovakia with adjacent network operators has been officially implemented into the European Economic Recovery Plan (EERP)

**Figure 6.** Project North – South


Source: Author

prepared by the European Council in December 2008. The total investment needs are substantially above EUR 160 million and financial support envisaged under the EERP is EUR 30 million.

2. Strategic gas stocks are normally owned and/or controlled by governments, with the aim of protecting consumers against non-market risk. Commercial parties normally do not cater for such an event, unless they have an obligation by law. We have to take into account that natural gas is more difficult and

expensive to store than other hydrocarbons: "Information available on gas storage facilities currently under construction suggest the initial capital cost of building UGS is between five to seven times the costs of underground oil storage facilities per tons of oil equivalent (toe) stored (IEA, 2008)". The state has its majority ownership participation in the decisive gas industry companies in Slovakia. Hence, when the European Commission currently proposes a 60-day safety standard for captive consumers, the following solution would be topical for Slovakia: to build new UGS for foreign commercial use but also to reserve part of it as strategic gas stocks held by the Slovak government. This solution is advantageous simultaneously in order to obtain economies of scale.

## Conclusions

Slovakia should concentrate on the creation of the so-called "gas industry diplomacy" in order to realize the above mentioned recommendation. It shouldn't rely only on the foreign strategic investors in the Slovak gas industry infrastructure. It is not sufficient to be only a statistician for the purpose of the preparation of the optimal solutions related to the SoS. Europeans could never achieve complete energy independence and therefore they seek better management of their energy dependence rather than achieving outright energy independence.

*Watching the political development in the Russian Federation in the recent years, the following should be valid not only for the EU but also for Slovakia: "Diversify sources and don't expect positive changes in Russia."*

Watching the political development in the Russian Federation in the recent years, the following should be valid not only for the EU but also for Slovakia: "Diversify sources and don't expect positive changes in Russia." The EU has set a certain level of the SoS in the energy package and it must be prepared to pay for it now.

The January gas crisis has given us instruction, we had also known about this before , but we had not realized it with such urgency. The only one acceptable partner for Russia or Ukraine able also to bring solutions is the European Union speaking in one voice. And we cannot forget that the support to Slovakia came not from Moscow in those cold January days, nor from Kiev, but from Prague, Berlin and Paris. The European Union has its economical, financial and negotiation potential to build also the gas pipeline Nabucco and guarantee natural gas sources for it.

Also is the situation that we will have to fight against South-East Asia, India, China and Japan for these sources. Energy was the main original motivation for European integration fifty years ago and it would be good to return to these roots today again.

Upon the initiative of the Visegrad Group a V4+ Energy Security Summit was held in Budapest on the February 24, 2010. It was attended by high ranking representatives from the countries of Central, East and South-East-Europe and important international stakeholders. The Czech Republic, the Republic of Hungary', the Slovak Republic and the Republic of Poland, as Member States of the Visegrad Group as well as the Republic of Austria, Bosnia and Herzegovina, the Republic of Bulgaria, the Republic of Croatia, the Republic of Serbia, the Republic of Slovenia and Romania express their support to strengthen cooperation in further integrating their gas networks and diversifying routes and sources of supplies:

- By promoting the North-South interconnections through all V4 countries, between the planned Croatian and Polish Liquefied Natural Gas terminals and also
- By further promoting and implementing the Nabucco and the NETS projects,
- By supporting the Constanta LNG terminal and other LNG and CNG projects in the wider Black Sea Region.

## References

Alhajji, A.F., "What Is Energy Security? (5/5)", *Middle East Economic Survey* Vol. LI, No. 2 (2008).

"An Energy Policy for Europe, Communications from the Commission to the European Council and European Parliament, Brussels" (2007).

Barton, B., Redgwell, C., Ronne, A., Zillman, D. (eds) *Energy Security – Managing Risk in a Dynamic Legal and Regulatory Environment.* (New York: Oxford University Press, 2004).

Belkin P., "The European Union´s Energy Security Challenges", *Congressional Research Service*. Prepared for Members and Committees of US Congress Order Code RL 33636 (2008).

Bortz, K., "Storage Set for Larger Role in Central and Eastern Europe", *Gas Matters* (August 2009), p. 17; www.gasstrategies.com.

Cameron, P. *Competition in Energy Markets – Law and Regulation in the European Union.* (New York: Oxford University Press, 2007).

"Commission Staff Working Document ADD1, ADD2, ADD4" Secretary-General of the EC, Interinstitutional File 2009/0108 (COD), Brussels (2009).

"Energy Diversification and Gas Security Update", IEA/GB(2008)33.

"European Directive No. 2004/67/EC of 26 April 2004 concerning Measures to Safeguard Security of Natural Gas Supply"; http://www.energy.eu/directives/l_12720040429en00920096.pdf.

"Geological Study on the Reservoir Conversion to Storage", *Nafta, a.s.*, Slovakia (1997).

"Proposal for a Regulation of the European Parliament and of the Council concerning measures to safeguard security of gas supply and repealing Directive 2004/67/EC", European Commission, Inter-Institutional File 2009/0108 (COD), Brussels (2009).

"The European Market for Seasonal Storage", The Clingendael Institute, Clingendael International Energy Programme (February 2006); http://www.clingendael.nl/publications/2005/20050800_ciep_misc_gas_storage.pdf.

*Underground Gas storage in Europe and Central Asia*. (Geneva, New York: United Nations, 1999).

Zhiznin, S. *Energy Diplomacy: Russia and the World*. (Moscow: Center of Energy Diplomacy and Geopolitics, Clingendael International Energy Programme, Energy Delta Institute, East Brook, 2007).

**Filip Černoch, Břetislav Dančák, Hedvika Koďousková, Petr Ocelík, Ivana Vrbková**

# The LNG Option: Re-thinking the EU's Gas Supplies?

Abstract*: The Russian-Ukrainian natural gas crisis from the beginning of 2009 once again accentuated Europe's energy dependency on Russian sources. This dependency represents various risks and creates pressure on solving the situation. Widespread utilization of LNG can serve as one of the solutions. The authors analyze whether LNG can truly take on its security role, what costs would be implied, and what are the potential hindrances of its future development.*

The Russian-Ukrainian natural gas crisis in 2009 once again accentuated Europe's energy dependency on Russian sources. This dependency represents various risks and creates pressure on solving the situation. Widespread utilization of liquefied natural gas (LNG) can serve as one of the solutions. As a source independent on firmly based pipelines, LNG allows for the connection between the consumer and most of the world producers, brings increased competition into gas trade, and allows for flexible management of global natural gas transfers.

All of these elements would considerably decrease Europe's mentioned dependency on Russian energy sources. However, until recently their implementation was hindered by objective economic and technical reasons including very high prices across the entire LNG chain, consequent lack of

***The authors*** *are members of the Energy Security program team at the International Institute of Political Science of Masaryk University, Brno.*

Černoch, F., Dančák, B., Koďousková, H., Ocelík, P., Vrbková, I., "The LNG Option: Re-thinking the EU's Gas Supplies?", *International Issues & Slovak Foreign Policy Affairs* Vol. XIX, No. 1|2010, pp. 61-78.

The article is based on a study conducted by the team of authors for the Ministry of Foreign Affairs of the Czech Republic.

competitiveness in comparison to traditional pipeline gas, and insufficient as well as ineffective infrastructure.

In the past few years both of these factors have changed extensively. Especially due to growing world prices and energy consumption – it seems that for the first time, LNG has become a significant supplement of pipeline gas and currently accounts for approximately one third of Russian supply in EU import.

## EU's Energy Situation

The EU 27 is dependent on the import of energy resources. Domestic production only satisfies approximately 46% of total consumption. Oil represents 60% of imported energy and is followed by natural gas at 26% and solid fuels at 13%. Domestic natural gas consumption (especially the Netherlands and Great Britain) covers approximately 2/5 of the consumption. The rest is imported mainly from Russia (42%), Norway (24%), Algeria (18%), and Nigeria (5%).

The aforementioned import dependency of course varies from state to state; while Denmark, as one of the few countries, is completely independent in energy terms – Ireland, Italy, Portugal, and Spain depend on import for more than 80% of their total energy consumption.

The import dependency is furthermore complicated by its connection with one supplier country; for example, Estonia, Lithuania, Latvia, Bulgaria, Slovakia, Ireland, Sweden, and Finland are all almost exclusively dependent on natural gas import only from one sole supplier.

The presented facts draw a sketch of the security gaps in the operation of Europe's energy industry. For the aims of this analysis it is however also necessary to determine the dominant trends of their future development. Precise quantification in this case is very complicated due to the long-term character of energy planning (for example, the time between discussions on the construction of a nuclear power plant and its launch is 15 years and the construction of other power plants or pipelines requires years as well), however the prevalent trends cannot be overlooked or underestimated. These trends are the ones who determine what investments into LNG are essential, necessary, or on the contrary redundant.

## Natural Gas Source Areas and their Potential for LNG

At present global natural gas reserves are able to satisfy the anticipated world demand and the physical volume of natural gas should not represent an

obstacle for the development of LNG even in the horizon of the next 20 years. Complications can rather be found on the side of processing infrastructure in the producing states and especially the increasing domestic consumption of natural gas in these producing states. For example, in Egypt domestic consumption increased by 9.9% in 2006-2007.

Delaying the construction of LNG projects is a frequent complication on the side of producer states. There is a lack of qualified personnel, the cost of construction materials is rising, and due to the tense situation on the building market the construction costs are increasing. Environmental and social problems related to local opposition against these projects also play their role. After the launch of a terminal its production capacity is generally not fully utilized especially due to technical difficulties, as in the case of the Norwegian terminal Snøhvit. We can also observe delays in the launch of Nigerian Brass and Olokola LNG, Angola LNG, or Yemen LNG. The finalization of the 4th LNG train unit of Qatargas II as well as Rasgas II has also been delayed due to construction complications.

*Delaying the construction of LNG projects is a frequent complication on the side of producer states. There is a lack of qualified personnel, the cost of construction materials is rising, and due to the tense situation on the building market the construction costs are increasing.*

In 2007 the EU imported 47.33 bcm of LNG. The main suppliers of LNG were Algeria, Libya, Nigeria, Norway, Oman, Qatar, and Trinidad and Tobago. In few cases the EU also received supplies from Australia, Malaysia, or the United Arab Emirates; because LNG is traded at significantly higher prices in the case of these countries, due to increased transport costs, these transactions were only limited to smaller volumes on the spot market.

***Producers with a High Growth Potential for the EU***

Qatar has by far the largest growth potential of LNG import into the EU. The reasons are following – immense natural gas reserves, stable production growth, and the expansion of LNG infrastructure (the construction of six giant LNG trains) which will connect all three major markets (USA, EU, and Southeast Asia) while allocating a part of the volume for flexible supplies. Qatar is relatively close to Europe and there are no serious limits or obstacles in the country preventing the development of LNG trade. Supplies from the first giant LNG train (Qatargas II project) with a minimum capacity of 10.6 bcm/y are

mainly exported to Great Britain (with the option of diverting supplies to other countries). It is however necessary to point out that LNG is to be transported from Qatar's terminals to the consumers by gigantic Q-Max (with a capacity of 260 thousand $m^3$) and Q-Flex (with a capacity of 210 thousand $m^3$) tankers. This creates a problem with the insufficient intake capacity of European import terminals which are generally not constructed for this tanker size.

Algeria, Nigeria, and Egypt remain significant LNG producers for the European market; all three countries are additionally planning to increase LNG production. The fact that the mentioned producers are geographically closest to Europe and the transport costs are therefore relatively low also plays an important role. The political situation is however more problematic. Nigeria will direct its future supplies especially to the American market and the EU will have to compete with it much more vigorously. The security and political risks in the country are also of great significance. Moreover the new natural gas policy of the Nigerian government from February 2008 indicates the priority use of natural gas for domestic consumption rather than export.

The growth of domestic consumption is also considerable in Egypt. Her increased significance in the future is also hinted by its developed infrastructure and the generally decreasing costs of LNG projects.

### *Stable Suppliers of Smaller Volumes*

In the future the EU will continue to compete with the USA for LNG supply from Trinidad and Tobago. It is very likely that this country will continue to be a stable LNG source for Europe. The construction of another LNG train would have a positive impact on the volume of LNG exported to the EU. The political situation of the country can also be assessed positively, on the other hand, the disadvantage lies in the geographic position of the country.

Another stable supplier is the new LNG producer on the market – Norway. Solving the technical problems led to increased production from the Sn hvit terminal and consequently its export to the EU; the possibility of the construction of a second LNG train is being discussed if consumer demand is adequate. The government is attempting to actively support the development of new deposits through tax and licensing policies. High extraction cost can however present an obstacle, however, they reflect the high environmental standards, the expensive work force, and the technological difficulties of construction in the arctic region.

### *Low Potential so far*

Smaller volumes will flow from Oman and Libya. Plans for larger supplies from Oman might face strict limitations in the form of increased domestic consumption

when 30% of the country's liquefying capacity is not used for export but reserved for domestic demand. This even questions the ability of the country to meet its high export commitments. We must also take into account the competition of the Asian market. Future development of LNG export will thus depend upon the success of geological surveys and production from new deposits.

Libya faces similar problems. However, due to its geographic position and vast natural gas reserves it holds great potential for the EU. The development of this potential depends, much like in the case of Oman, on adequate investments into prospecting and production and the political stability of the country. LNG export still remains at low levels due to technical difficulties but plans for new terminals have already been drawn up.

Australia, Malaysia, and the United Arab Emirates are also able to supply limited volumes of LNG. Their main outlet is naturally the pacific market; nevertheless the past years have shown that export into the EU is also possible (to a great extent it was however related to a short-term drop in Asian demand and cannot therefore be perceived as a long-term trend). Among the mentioned countries the potential of the UAE is the smallest and their export is expected to decrease. Australian supply could, on the contrary, increase due to planned projects and a part of the production would be reserved for the spot market.

### *A Promise of Supply*

This promise comes especially from Equatorial Guinea and Angola. The former is experiencing rapid development in LNG and the next impulse will be related to the launch of the second LNG train anticipated, at the soonest, in three years. The increased interest of foreign companies on the export of LNG from the latter is also tied to the discovery of new natural gas deposits. Between 2011 and 2012 Angola should launch its first LNG terminal with a capacity of 6.9 bcm/y with 5.5 bcm/y intended for the American and European markets.

## The Global LNG Market and the EU's Place within it

Unlike the oil market, the LNG market cannot truly be considered a global market; in fact it is separated into three distinct regions. By far the largest one is the Asian market with a 70% share on world trade. Japan and South Korea are leading the region with China and India experiencing a boom in production in the past few years. Next to the traditional exporters supplying the Asian market – Indonesia, Malaysia, and Australia – the Middle East countries are gradually gaining a strong position in this region. The European market comes second after the Asian market with a steady increase in consumption. Last but not

least, the North American market is also experiencing rapid growth, its larger development is however limited by insufficient infrastructure and a traditionally lower emphasis on LNG.

At present there are 16 operating terminals in Europe including two Turkish ones. New terminals are being constructed both in current LNG importing countries and in potential future importers. The number of LNG importers in Europe is therefore expected to rise and include Germany, Ireland, Holland, Poland, and Croatia. If all construction plans for new terminals are upheld there should be as many as 34 operating terminals by 2012.

*A significant increase in regasification capacities can be observed in Europe, as well as in the rest of the world, which adds to the progressively insufficient production of LNG on the part of exporting countries.*

A significant increase in regasification capacities can be observed in Europe, as well as in the rest of the world, which adds to the progressively insufficient production of LNG on the part of exporting countries. On the other hand, since around 2005 we can also observe delays and complications in the flow of foreign investments into new LNG projects. The main expansion of capacities previously anticipated for the year 2012 will therefore probably be delayed until 2015.

European LNG importers cannot be categorized in one general box due to the differences in each individual national natural gas market. On the other hand, the heterogeneous character of the importing states allows us to identify the mechanisms governing LNG import in the case of European countries.

***Examples of Selected LNG Importers***

Great Britain and Spain can be considered as typical examples of countries laying great emphasis on the future development of LNG.

Today, LNG only serves in Great Britain as a backup source in case of a disruption of conventional natural gas supply. The country serves as a perfect example of a practical reaction to future prognosis which anticipates the decrease of domestic natural gas production and stable natural gas supplies from Norway and the European continent. LNG is therefore counted upon not only as a supplementary source, but also as a primary source used to increase import capacities. In case of any disruptions in the expected stable volume of natural gas imported from Norway or the European continent the significance of LNG would increase further. By 2016 to 2017 LNG supply will be necessary to meet the anticipated demand for natural gas.

The measures adopted by Great Britain, as the main natural gas consumer in Europe, can serve as a good example for other European consumers on how to increase energy security on the natural gas market. LNG is by no means a panacea, but a valuable instrument towards the diversification of sources and the improvement of supply security and competition on the natural gas market. One can therefore assume that LNG should play a similar role throughout the EU.

After all, Great Britain is pushing for an active natural gas policy not only on the national level but also on the EU level. The events of 2006 – when procurement of natural gas imports to the continent was problematic due to regulatory, trade, and infrastructure obstacles – led Great Britain to include the problem of the insufficiently liberalized internal EU market in its natural gas security strategy and cooperate with the European Commission on improving the situation. One of the most liberal approaches presents Great Britain as an example of the desired development on the natural gas market in the whole of Europe. The liberal character and effectiveness of the British market is based on an intricate system of coordination between the government, the regulator, and the companies operating in the natural gas sector. Besides its domestic consumption Great Britain also exports natural gas to Ireland.

In Spain the natural gas market evolved later than in other Western European countries due to the low level of domestic production and the geographic position of the country on the periphery of the traditional European pipeline market with gas. Since the 1990s the Spanish government has however preferred diversification in its energy mix and supported the increase of natural gas share on the total consumption of energy in the country. Dependency on the import of natural gas from abroad has furthermore forced Spain to diversify supplies in terms of the LNG/pipeline ratio. In 2007 Spain thus became the third largest LNG market in the world after Japan and South Korea. LNG supplies satisfied 2/3 of domestic natural gas demand.

Spain's reaction to growing dependency on natural gas import can thus also be considered as flexible. Due to technological developments and the decreasing prices of LNG supply during the 1990s, Spain did not focus only on traditional gas pipelines but preferred multiple options of natural gas import. The role of LNG in Spain is furthermore strengthened by its utilization as a supplementary storage capacity (at the beginning of 2006 the Spanish Ministry of Industry, Tourism, and Trade decided to maintain two LNG freighters on the coast in case of shortages). LNG reserves currently represent the equivalent of 4 days of national natural gas consumption. It is therefore obvious that Spain is currently capitalizing on the advantages of LNG supply both in diversifying natural gas import and ensuring sufficient storage capacities.

## LNG Production and European Infrastructure

The share of LNG import on overall natural gas import into the EU was 13% in 2007. In 2006 this represented 9% of total natural gas consumption in Europe, which means this volume has approached one third of the natural gas supply from the Russian Federation. In 2020 the share of LNG on total EU natural gas imports could thus increase to approximately 20%.

World LNG production capacities in 2008 were 268 bcm/y. This represents a 9% increase compared to 2007. IEA estimates for 2009 put the increase of LNG production capacities at 30% or approximately 330 bcm/y. The number of production terminals for 2010 is estimated at 43 with an overall capacity of 359 bcm/y.

*There is a significant world and European surplus in regasification capacities over liquefaction capacities and the global market is characterized by a demand surplus. This situation can further deteriorate because the producers are waiting or stopping export due to the increase of their own domestic demand.*

Regasification capacities reached 588 bcm/y in 2008. By 2010 the anticipated number of terminals should increase to 68 across the world with a capacity of 658 bcm/y (IEA estimates expect an increase of 180 bcm/y, i.e. a 20% increase to more than 700 bcm/y). EU regasification capacities were 96 bcm/y in 2007. By 2010 the number of terminals should increase to 20 with an overall capacity of 153 bcm/y. This represents an anticipated increase of approximately 60%.

A 34% increase in liquefaction capacities and a 12% increase in regasification capacities can be expected in 2008-2010. Nevertheless due to the absolute volumes of both capacities the ratio remains the same. The disproportional ratio of 2:1 in favor of regasification capacities over production capacities will continue. In other words, the average utilization of liquefaction terminals is approximately 93% whereas the average utilization of regasification terminals in the EU is only 54% and in the USA only 33%.

There is a significant world and European surplus in regasification capacities over liquefaction capacities and the global market is characterized by a demand surplus (seller's market). This situation can further deteriorate because the producers, who massively invested in liquefaction capacities in the past, are waiting or stopping export due to the increase of their own domestic demand.

### *The LNG Chain – Cost Distribution*

To evaluate the benefits and costs of an LNG project we must take a closer look at the entire LNG chain – the costs of production and liquefaction of natural gas, its transport to the customer and subsequent regasification, and potentially its transit to the consumer.

The trend of decreasing costs throughout the entire chain, which can be observed over the past years and will be discussed later, is crucial to the analysis and further debate.

### *Production and Liquefaction (Upstream)*

In the case of LNG production costs being substantially reduced by increases in the capacity of liquefaction facilities. For example, costs are almost 30% lower in the case of two liquefiers at 5.5 bcm capacity than in the case of four liquefiers at 2.8 bcm. If one liquefier unit of 10.3 bcm is used, costs would be further reduced by another 20% (this hypothetical case is not based on an expansion (brown-field) but a comparison of three alternatives of new projects (green-field) with an expected output of 11 bcm/y). A specific example of applying the economy of scale in terminal expansion can be found in the case of Qatargas I supplying LNG to Spain and Japan (LNG train 1) expanded by a second and third unit supplying the North American market. In the case of the first liquefier the costs were EUR 160/t LNG in the case of the second and third unit the costs decreased to EUR 130/t LNG.

A closer look at the history of LNG trade (i.e. the beginning of the 1970s) shows a cost decrease by approximately 35%. During the same period costs were reduced by 40% in transport especially due to the inclusion of Asian ship yards. The enlargement of the LNG market itself plays an important role as it prompts the activation of new actors and further pressure on cutting costs.

On the other hand, the time necessary for the completion of terminals has increased. While terminals constructed between 2003 and 2006 were finished in less than 3 years, today it takes from 4 to 5 years or in some cases even longer (for example LNG Adria).

### *Transport (Midstream)*

The global fleet currently consists of 299 LNGVs (LNG tankers) with a total capacity of 41.4 mcm (the average volume of tankers is 138 000 $m^3$) and another 78 tankers with a capacity of 13.7 mcm have already been commissioned. In the second quarter of 2008 the European market was supplied by 57 ships at a capacity of 7.3 mcm (15 ships from the Middle East and the rest from the

Atlantic region, none from the Pacific region). There are another 17 ships under construction for the European market at a capacity of 3.9 mcm.

Compared to the oil fleet (approximately 8700 tankers) the number of LNGVs is still negligible. LNG sea transport is characteristic by being vertically integrated. It is so far dominated by long-term trade contracts which ensure the return of high initial investments.

In 2000 the average distances of LNG supplies were 5,700 km, in 2006 6,300 km and a year later 6,700 km. In 2010 these distances can increase to 8,000-8,500 km. Qatar is more than 11,000 km away from Europe or East Asia. Further analysis will show why transport distance is one of the key factors influencing the economic competitiveness of LNG on a given market.

The transport of natural gas, whether in its gaseous or liquid state, is considerably more expensive than the transport of coal or oil. This is given by the fact that natural gas is an energy resource with low energy density. Comparing LNG expenses with pipeline infrastructure clearly shows that LNG projects have higher fixed costs and, in case of short distances, also higher transport costs (variable costs). The determination of the break-even-point of overall expenses, i.e. the moment when LNG transport becomes economically profitable, depends on the capacity of compared transport alternatives and distance. It is obvious that with increasing distance the transport costs grow much faster in the case of pipeline transport.

LNG transport thus becomes profitable when large volumes of natural gas (approximately 1 bcm/y) are transported over long distances (approximately 3,000 km and more). Pipeline transport (PNG) is most profitable when large volumes are transported over short distances. Non-conventional (non-pipeline) methods of transport, such as compressed natural gas (CNG), are ideal for the transport of small volumes over short distances.

**Table 1.** Global LNG Fleet: as of 2008 and Current Commissions

| Type | Capacity ($1,000\ m^3$) | Operating | | | Commissioned | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Until 09 | 09 | total | 09 | 10 | 11 | 12 | 13 | total | |
| **Q-Max** | > 250 | 4 | 0 | 4 | 8 | 2 | 0 | 0 | 0 | 10 | 14 |
| **Q-Flex** | > 200 | 20 | 0 | 20 | 4 | 4 | 0 | 0 | 0 | 10 | 30 |
| **Standard** | 100 - 200 | 244 | 0 | 244 | 16 | 16 | 13 | 2 | 0 | 59 | 303 |
| **Small** | < 100 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| **Total** | | 298 | 0 | 298 | 42 | 22 | 13 | 2 | 0 | 79 | 377 |

Source: www.coltoncompany.com.

The tendency to increase capacities is thus an important trend aiming to transport LNG at competitive prices over even greater distances than before. However compared to oil transport LNG shipping is still considerably more expensive. In comparison with an oil tanker an LNGV is twice as expensive and carries approximately four times less energy.

The current capacity of the LNG fleet is sufficient in relation to demand. Between 2007 and 2008 production capacity increased by approximately 14% and transport capacity increased by 20%. The typical utilization of the LNG fleet is around 70%. The number of LNGVs should grow to 350 in 2010. The usual time necessary to build one ship is 4 years.

A slight increase in the utilization of the LNG fleet is planned (approximately 75% by 2012) with a rising share of capacities allocated for flexible trade (short-term contracts and the spot market).

***Regasification (Downstream)***

Regasification is the least technologically and financially demanding part of the LNG chain which is documented by the surplus of regasification capacities in comparison to liquefaction capacities at a ratio of approximately 2.1:1. By 2010 this ratio is expected to decrease to 1.8:1 in favor of regasification capacities. Overall the utilization of regasification terminals is at 44% (54% in the case of the EU).

Investments into regasification terminals (include two LNG storage tanks) vary from EUR 320 million (Spanish Bilbao with a capacity of 7 bcm/y) to EUR 800 million (Italian Rovigo with a capacity of 8 bcm/y). Construction takes about five years including planning.

The prospect of onboard regasification is starting to significantly influence the entire process. These terminals are already operating in the USA and Great Britain and new ones are planned in Argentina or Kuwait.

Problems related to the operation of terminals by companies other than only the companies owning them, play an important role in the utilization of LNG terminals as well as the construction of new ones. The exclusive presence of domestic operators on existing, constructed, or planned terminals understandably limits foreign competition while the management of national terminals by foreign companies brings a certain amount of international competition which supports market integration. In 2009 73% of the total capacity of 96 bcm was managed by domestic operators while only 21% of the total capacity was used by foreign operators from EU countries. The remaining 6% was operated by non-European producers, especially Qatar and Algeria. Terminals are thus predominantly managed on the national level.

The utilization of terminals is also considerably influenced by how LNG supplies are contracted. This is largely given by the high investment demands of the entire LNG chain. Investment return (especially into upstream) is therefore covered by long-term contracts (LTC). A limited amount is generally allocated to flexible trade which bears a higher level of both risk and profit.

However the capacity of many LNG terminals in the EU is fully utilized for long-term contracts which makes it impossible to receive shipments from non-contract destinations in case of need (for example to replace a part of pipeline supplies). This concerns terminals excluded from Article 22 of Directive 2003/55/EC (non-regulated terminals) like all British terminals or GATE in Holland. The capacity of these terminals is reserved for the parties of LTC and even though physically the regasification capacity generally exists (with the average EU utilization at 54%) the access of third parties (TPA) is restricted.

*Problems related to the operation of terminals by companies other than only the companies owning them, play an important role in the utilization of LNG terminals as well as the construction of new ones.*

The second regulation regime type includes terminals with combined access such as those in Italy, Spain, or France. The ratio of capacities reserved for LTC (capacities excluded from Article 22) and TPA (regulated component) varies: in France 90% is reserved for LTC, in Italy 80%, and in Spain 75%. Regulated terminals such as the Belgian Zeebrugge allow third party access to their entire capacity.

The existence of non-regulated terminals is to a large extent a necessity of ensuring investment return on the upstream. Terminals with combined access then represent a compromise between ensured long-term supply and investment return on the one side, and flexibility and economic profitability on the other. Due to the large surplus of regasification capacities and strong competition characteristic for the spot market (especially from the Asian market) it is not always easy to gain the surplus capacity reserved for spot trade. The complete reservation of terminal capacities for LTC is against the principle of diversification which is the greatest benefit of LNG in terms of energy security.

### *Typical Costs of the LNG Chain*

At present, the typical cost of liquefaction is approximately EUR 800 million for a LNG liquefier at a 5.5 bcm capacity, with operating expenses lower than 5% of the capital investment. By adding a second unit expenses decrease by approximately 20% per unit – the savings effect from the aforementioned

economy of scale. It is anticipated that liquefaction capacities will be increased precisely through the expansion of existing units. Overall liquefaction costs (with production) represent approximately 50% or more from the expenses of the entire chain.

Despite a significant drop in transport costs this part of the chain still represents a considerable expense – typical operating expenses are around EUR 12 million annually for a tanker travelling 4,850 km with a capacity of 130,000 $m^3$. While transport costs only represent 10% of the final price in the case of oil; in the case of LNG his figure increases to 10-30%. The main variable cost in transport is market distance – the greater the distance, the more ships (with the same capacity) are necessary to ensure the continuity of supply. This increases transport costs and depreciates the value of the fleet. While the supply of 7 bcm from Nigeria to Europe requires 5-6 ships, the same volume can be supplied from Algeria by 2 ships. Once again there is an opportunity for the economy of scale (Q-Flex or Q-Max ships). Transport costs are thus a function of market distance and tanker capacity with other determining factors such as the price of the ship and contract type (costs are the lowest for LTC and the highest for flexible trade).

A regasification terminal with a capacity of 4.1-8.3 bcm costs approximately EUR 100-500 million. Operating expenses for a terminal with a regasification capacity of 4.5 bcm and a storage capacity of 200 thousand $m^3$ are approximately EUR 11 million annually.

## LNG Market Rules

The gradual tendency to shift a part of the trade with liquefied natural gas from long-term contracts onto the spot market is the most important aspect of LNG market development and its potential for the European Union. So what is the situation?

At present LNG trade has been dominated by traditional LTC for 5 years and more, the trend is aiming toward intermediate-term contracts (ITC, less than 5 years) and especially short-term contracts (STC, 1-2 years) as well as spot trade. Out of the supply contracts activated in 2008-2009 – 40% can be considered as flexible (these include STC and spot trading). Half of them are located in the Middle East; the region with problem-free access to all main LNG markets.

Along with the spot market, short-term contracts account for approximately 20% of global LNG sales and represent a crucial instrument for the replacement of insufficient LTC supplies as well as a means of capitalizing on short-term trade

opportunities. The tendency of LNG producers to contract a smaller volume of supplies as LTCs in order to utilize the fluctuation of market prices is increasing. A 30% share of short-term contracts on the global market is anticipated at the beginning of the next decade.

The development of the spot market depends especially upon an increase in the surplus capacity of long-distance supply (not even mentioning a surplus production capacity), i.e. the reserved non-contracted LNGV capacity available for capitalization on price fluctuations on individual markets. The adequate demand of end consumers, in combination with sufficient regasification capacities on the given market, represents another important factor. The fulfillment of the last condition is by far the easiest. LNG spot market development also requires new companies focused on STCs and spot trading, as well as new independent LNG transport operators. However due to the high entry costs, it is rather the large companies that are strengthening their position. The market situation is thus rather similar to the model of oligopolistic competition.

Between 2000 and 2007 trade on the spot market increased 4-fold, which is a positive development in terms of energy security. This is because the spot market, with its (almost) global coverage, allows for perfect geographic and transit diversification much like in the case of the oil market. However, as shown before, an analogy to the oil market is not quite possible since both markets are considerably different in size. To illustrate – approximately 47% of global oil consumption is transported by sea (approx. 40 million barrels a day), this would be the equivalent of 2,280 bcm/y of natural gas (approx. 1.7 billion tons of LNG). In comparison, LNG only accounts for approximately 8% (approx. 233 bcm/y in 2007) of world natural gas consumption (2,922 bcm in 2007); this only represents one tenth of the volume of oil trade at sea.

Beside the global spot market, which contributes to the security and increased volume of supplies to the EU, internal spot trade within the European Union itself plays a crucial role. At present however, this trade is quite random and mostly takes place between Spain and Great Britain; it should grow with further increases in EU regasification capacities and the opening of new LNG markets. A dramatic shift from long-term contracts cannot be expected due to the constantly high cost of production facilities (LNGC); the continuing construction of LNGCs for already concluded LTCs is anticipated.

## Conclusions

The analysis of LNG chain costs proved that the cost of LNG (per unit) is decreasing – while in the mid 1990s the overall cost of one ton of LNG, including the entire

chain, amounted to approximately EUR 560, in 2009 it was approximately EUR 320, and by 2030 costs are expected to drop to approximately EUR 255. World LNG production is increasing. This is also represented by the share of LNG on natural gas import to the EU which grew from 7% to 13% between 2005 and 2008. The volume of LNG tankers is increasing dramatically and more effective liquefaction and regasification technologies are accessible. The stronger role of Middle East producers along with flexible trading is stimulating the convergence of prices on all three dominant markets and competition between these markets is intensifying. The significance of LNG to European energy is enhanced by the security interests of EU countries – whether they strive to diversify suppliers or ensure additional sources at a time of decreasing European production.

At the same time, LNG cannot be seen as a source which could, for the greater part, replace the main supplier of natural gas to Europe – Russia in the next 10 to 20 years. A number of factors are against this. Firstly, the production possibilities of countries exporting liquefied natural gas. They are attempting to increase export, their number is growing, and the volume of LNG produced for the world market is increasing as well. However, it all started and continues on a relatively small basis. Furthermore, demand for LNG on all three main markets will grow even faster. And last but not least, in the future the volume of exported LNG could be significantly influenced by the rising domestic consumption of producing countries (for example Nigeria or Oman).

The development of LNG trade is not without problems even on the side of consumer states. The authors of this analysis however do not see them in the number of regasification terminals. At present, import into the EU only utilizes 54% of regasification capacities. The terminals under construction as well as planned terminals (there are currently 21 terminals in the EU with a status of: under construction or planned) will thus comfortably cover future increases in production capacities and import. Their intake capacity represents a more serious problem – only three British terminals (and the Croatian Adria terminal under construction) can accommodate the new generation of modern LNG supertankers. The current terminals do not correspond with the parameters of the newly built LNGVs.

As shown by Italy, the crucial problem with LNG on the European side lays elsewhere. It rests within the transport and distribution of natural gas throughout the EU where the existing infrastructure and current settings of the trade and transport system of natural gas restrict its flexible distribution across the EU. In other words, even if sufficient reserves are available in countries with terminals, it is by no means certain that this natural gas could make its way to countries which are suffering from long-term or acute natural gas shortages.

The conclusions of the analysis can thus be summarized as follows: LNG plays an important role in the energy security of the EU. This role will most likely gradually strengthen in time. The cause of this growth will stem mainly from objective economic reasons which will lead to higher LNG imports. If there is no political impulse from EU member states or the EU itself, we can assume that in 10 to 20 years LNG will still only be a supplementary rather than a fundamental source of energy. While LNG can be an important and crucial source in terms of security in some countries or regions – on the EU level, at least in this time frame, it cannot play the role of a substitute for Russian supply.

As mentioned before, a strong political impulse is necessary to change this situation. This impulse should include pressure on increased production. A larger volume of tradable liquefied natural gas is crucial for a stronger LNG market. In this case however the EU or European countries individually do not have an adequate possibility of influencing the internal policies of producers; European companies which often finance and build the upstream chain in these countries can serve as the only available instrument. Long-term contracts, which are often the only element capable of producing a sufficient impulse for the supplier to construct financially costly facilities, represent another direct contact. (Despite the growing spot market which however cannot yet initiate the construction of expensive LNG facilities.)

*A strong political impulse is necessary to change this situation. This impulse should include pressure on increased production. A larger volume of tradable liquefied natural gas is crucial for a stronger LNG market.*

Attention must also be devoted to the technical and infrastructural aspects of LNG trade. European terminals must be compatible with the current modern LNG fleet. Terminals should be constructed with emphasis on the new high-capacity Q-Max tankers. Support should also be directed at onboard regasification projects which only cost about one tenth of the conventional land terminals and posses a similar capacity. Their construction, including planning, can be done in 12 months and faces no environmental problems.

The EU must represent an attractive market for the suppliers due to intensifying international competition. The separation of transit network operators from the suppliers themselves has a positive impact and attracts investments into new infrastructure, including LNG terminals. Transparent third part access rules to LNG terminals and their practical fulfillment also represent an important element.

## References

"BP Statistical Review of World Energy 2008" (2008); http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/downloads/pdf/statistical_review_of_world_energy_full_review_2008.pdf.

Chiu, C.H., "History of the Development of LNG Technology", presentation at the Annual Conference – Hundred Years of Advancements in Fuels and Petrochemicals in Philadelphia (November 18, 2008); http://www.nt.ntnu.no/users/skoge/prost/proceedings/aiche-2008/data/papers/P139095.pdf.

"Commission Staff Working Document accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Second Strategic Energy Review: an EU Energy Security and Solidarity Action Plan: Europe's Current and Future Energy Position, Demand – Resources – Investments", http://ec.europa.eu/energy/strategies/2008/doc/2008_11_ser2/strategic_energy_review_wd_future_position2.pdf.

"Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Second Strategic Energy Review: an EU Energy Security and Solidarity Action Plan, COM/2008/0781 final" (Brussels, 2008); http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52008DC0781:EN:HTML:NOT.

Dorigoni, S., Portatadino, S., "LNG Development across Europe: Infrastructural and Regulatory Analysis", *Energy Policy* Vol. 36, No. 9 (2008).

Eng, G., "A Formula for LNG Pricing – An Update", New Zealand Ministry of Economic Development (2008); http://www.med.govt.nz/upload/65505/Formula_for_LNG_Pricing.pdf.

*EU Energy and Transport in Figures. Statistical Pocketbook 2007/2008.* (Brussels: European Commission, DG for Energy and Transport 2008); http://ec.europa.eu/dgs/energy_transport/figures/pocketbook/doc/2007/2007_pocketbook_all_en.pdf.

Gudmundsson, J.S., Graff, O.F., "Hydrate Non-Pipeline Technology for Transport of Natural Gas", presentation from the World Gas Conference, Tokyo (2003); http://www.ipt.ntnu.no/~jsg/publikasjoner/papers2003/Tokyo2003Hydrate.pdf.

Jensen, J.T.: *The Development of a Global LNG Market. Is it likely? If so, when?* (Oxford: Oxford Institute for Energy Studies, 2004).

*LNG in Europe, an Overview of European Import Terminals.* (King & Spalding, 2006); http://files.meetup.com/207586/Rigassificatori%20–%20RAA%20Sintesi%20Terminali%20LNG%20in%20Europe.pdf.

Lopac, A.A. *Recent Trends in Transporting of LNG.* (Zagreb: SD Naftaplin, 2008).

Najibi, H., Rezaei, R., Javanmardi, J., Nasrifar, K., Moshfeghian, M., "Economic Evaluation of Natural Gas Transportation from Iran's South-Pars Gas Field to Market", *Applied Thermal Engineering* Vol. 29, No. 10 (2009).

*Natural Gas Market Review 2007;* http://www.iea.org/Textbase/publications/free_new_Desc.asp?PUBS_ID=1909.

*Natural Gas Market Review 2008.* (Paris: IEA, 2008).

Nieuwoudt, S. *A Global LNG Market on the Horizon.* (Pickering Energy, 2007).

Pontoni, F. "LNG Shipping: a Descriptive Analysis", University of Bocconi, IEFE (2008).

"Proposal for Directive of the European Parliament and of the Council amending Directive 2003/55/EC concerning common Rules for the Internal Market in Natural Gas, COM(2007) 529 final"; http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0529:FIN:EN:PDF.

"Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EC) No 1775/2005 on conditions for Access to the Natural Gas Transmission Networks"; http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0532:FIN:EN:PDF.

Rüster, S., Neumann, A. "Corporate Strategies along the LNG Value Added Chain – an Empirical Analysis of the Determinants of Vertical Integration"; http://www.tu-dresden.de/wwbwleeg/publications/wp_gg_17_ruester_neumann_LNG_vertical_integration.pdf.

Stern, J. *The New Security Environment for European Gas: Worsening Geopolitics and Increasing Global Competition for LNG.* (Oxford Institute for Energy Studies, 2006); http://www.oxfordenergy.org/pdfs/NG15.pdf.

"The Global Liquefied Natural Gas Market: Status and Outlook", *US Energy Information Administration* (2003); http://www.eia.doe.gov/oiaf/analysispaper/global/importers.html.

"The LNG Market, Globally now to 2025 and the Implications for the UK", Report for the Department for Business, Enterprise and Regulatory Reform (2007); http://www.berr.gov.uk/files/file41844.pdf.

**Eltay Dilbazi**

# Energy Security and Alternative Sources in the Caspian Sea Region

Abstract: *Questions related to energy security are currently among the most important issues in Europe. A number of major reasons are the cause, for example, of the lack of energy reserves and the increasing dependence on one supplier – Russia. The search for alternative means of ensuring the energy security of Europe is becoming a policy priority of EU member countries. Furthermore, the ongoing Russian-Ukrainian dispute in natural gas supply is complicating the transit of this resource into Europe. The fundamental question of this analysis is whether the Caspian region can play an active role in supplying the European market with energy resources.*

Questions related to energy security are currently among the most important issues in Europe. A number of major reasons are the cause, for example, of the lack of energy reserves and the increasing dependence on one supplier – Russia. The search for alternative means of ensuring the energy security of Europe is becoming a policy priority of EU member countries. Furthermore the ongoing Russian-Ukrainian dispute in natural gas supply is complicating the transit of this resource into Europe.

The Nabucco project has recently become one of the very significant and widely discussed energy projects proposed by a number of the EU Member States. This project was intended as one of the alternatives to the Russian natural gas monopole and should thus provide a more secure supply of natural gas to Europe. This pipeline should allow the flow of natural gas from the Caspian region all the way to Vienna. At first the natural gas should only come from Azerbaijan but future supplies should be provided by the entire Middle East region. The planned route

***Eltay Dilbazi*** *works at the Department of the International Relations and European Studies of the Faculty of Social Studies at the Masaryk University in Brno, the Czech Republic.*

Dilbazi, E., "Energy Security and Alternative Sources in the Caspian Sea Region ", *International Issues & Slovak Foreign Policy Affairs* Vol. XIX, No. 1 | 2010, pp. 79-94.

of the project leads through Turkey – Bulgaria – Romania – Hungary – Austria. This means that the Caspian Sea region is the key supplier of the project. It is necessary to mention that the Nabucco project has its supporters as well as opponents. Some analysts claim that the project is very successful and necessary[1] while others maintain the opposite[2]. Their positions are influenced by a number of issues and especially by the Caspian Sea status question. Many articles, studies, and opinions on the contribution of this project have been published in European press, but only a limited amount of attention has been devoted to the representatives of the opposition to the project. The fundamental question of this analysis is whether the Caspian region can play an active role in supplying the European market with energy resources.

## The Energy Sources of the Caspian Region

After the dissolution of the Soviet Union carbohydrate energy sources in the Caspian states were discovered mainly along the Caspian Sea shelf. It was the dissolution of the Soviet Union which on the one hand allowed for the independence of the three 'satellite' states but on the other hand left behind a number of unresolved issues.

*The Caspian region /Caspian states fall within the category of countries with significant energy resources. The extraction of oil in the Caspian region began in the 1860s.*

In contrast to the majority of oil exporting countries, where information centers are in the habit of providing specific data, the Caspian states are very limited in this regard. This leads to a deficit of information as well as its correctness despite the presence of Western energy companies in all the states of this region and thus complicates the elaboration of exact statistical analyses.

Based on historical and geological research studies it is possible to state that the Caspian region/Caspian states fall within the category of countries with significant energy resources. The extraction of oil in the Caspian region began in the 1860s. Therefore there are many studies and analyses of the carbohydrate

[1] A. Hetaguri, "Nacionalnyje interesi sovpodajut", *Caspian Energy* Vol. VIII, No. 53 (2008), p. 42.

[2] B. Antonov, "Konkurenty iz zapada", *Ria Novosti* (January 17, 2008).

**Table 1.** Oil Reserves of Caspian Region Countries (billion tons)

| Territory | Land | Sea (Caspian) | Total |
|---|---|---|---|
| Russia | 12.0 | 5.0 | 17.0 |
| Kazakhstan | 11.0 | 17.0 | 28.0 |
| Azerbaijan | 9.0 | 18.0 | 27.0 |
| Turkmenistan | 4.0 | 7.0 | 11.0 |
| Iran | 2.0 | 5.0 | 7.0 |
| Total | 38.0 | 52.0 | 90.0 |

Source: SOCAR statistic in A.M. Guliyev *Energy Carriers: Options and Prospects.* (Baku: Nafta – Press 2006), p. 78; http://www.echo-az.com/archive/016/economica.shtml#2.

resources and security of this region. It is however necessary to mention that the majority of these studies, especially the Western ones, are concerned rather with geopolitical issues and economic assessments and only a few are focused on the evaluation of oil geologists' research. In order to precisely asses the economic attractiveness of the Caspian region and categorize it according to its level of importance it is necessary to take a closer look at the studies of local experts (Russian, Iranian, Kazakhstani, Azerbaijani, and Turkmen).

Based on geological research in the Caspian region oil reserves beneath land and the sea shelf can be estimated at a total of 90 billion tons. The following table shows the distribution of oil reserves among the countries.

The table shows the energy resource share of every state. If we calculate with the energy potential of the entire region as a whole then the capacity of Caspian states comes in at a close second place after the Middle East. 31.1% of carbohydrate capacities within the Caspian Sea region are located in Kazakhstan's territory, 30% in Azerbaijan's territory, Russia is third with 19%, Turkmenistan fourth with 12.2%, and Iran is last with 7.8%.

However when this data is compared with the statistical data mentioned above concerning world oil reserves it becomes apparent that the shares of global energy actors Iran and Russia in the Caspian Sea are negligible. This means that the energy reserves of the Caspian Sea only play a minor role in the formulation of the global energy policies of both countries. The concentrations of energy resources in the Iranian and Russian sectors of the Caspian Sea are very low.

It is necessary to say that due to the increased value and interest of western investors the information provided by state bodies on the energy reserves of Caspian states (namely Azerbaijan, Kazakhstan, and Turkmenistan) is not precise in some cases. In most cases it is very hard to verify given information.

**Table 2.** Oil Reserves of Caspian States (without Iran) for 2006 (billion tons)

| States | Confirmed Reserves | Estimated (potential) Reserves |
|---|---|---|
| Azerbaijan | 0.5-1.7 | 4.5 |
| Kazakhstan | 1.3-2.5 | 12 |
| Russia | 10 | 20 |
| Turkmenistan | 0.075-0.1 | 4-12 |

Source: Y.K. Shafranik, "Neftjanaja Ekspansija v SNG", *Mirovaja energetičeskaja politika* Vol. 5-6, (2002), pp. 56-62.

**Table 3.** Confirmed Oil Reserves of Caspian States (without Iran) for 2007 (billion tons)

| States | Confirmed Reserves |
|---|---|
| Azerbaijan | 0.96 |
| Kazakhstan | 1.23 |
| Russia | 9.5 |
| Turkmenistan | 0.07 |

Source: "BP Statistical Review of World Energy" (June 2007).

To illustrate this, the author points out the discrepancies in data provided by the highest state officials of some Caspian states:

"The carbohydrate potential of the Caspian Sea accounts to 17 billion tons (125 billion barrels). Kazakhstan's share is 50-60 billion barrels, Azerbaijan's 27 billion barrels, Turkmenistan's 16 billion barrels, Russia's 15 billion barrels, and Iran's 7.5 billion barrels."[3] According to another statement of the former Kazakhstan's Minister of Energy, Vladimir Shkolnik: "Kazakhstan's confirmed oil reserves amount to 4 billion tons and natural gas reserves to 3 billion $m^3$"[4].

For example according to the representatives of Azerbaijan's energy industry "the oil potential of Azerbaijan is 8 billion tons and the natural gas reserves amount to 10 billion $m^3$ (9 billion tons in oil equivalent)"[5].Other contradictory information on the evaluation of Azerbaijan's energy reserves comes from the former president of SOCAR Natiq Aliyev: "The carbohydrate reserves of the

[3] A.M. Guliyev *Energy Carriers: Options and Prospects*. (Baku: Nafta – Press 2006), p. 201.
[4] S.S. Zhiltsov, I.S. Zonn, A.M. Ushkov, "Geopolitika Kaspiskogo regiona", *Mezhdunarodnije otnoshenija* (2003), p. 117.
[5] A.M. Guliyev *Energy Carriers: Options and Prospects*. (Baku: Nafta – Press 2006), p. 207.

Caspian Sea in Azerbaijan's sector are between 4 and 10 billion tons. Translated into the oil equivalent this amounts to 2.65-5.3 or 6.6 billion tons."[6]

The above mentioned evaluations and assessments show how much the term 'energy potential' is being misused. In case of 'potential' the space for maneuvering and providing inaccurate data is very wide which is why it is the most commonly used term among state representatives of various governments.[7]

For comparison let us present two tables to illustrate the differences in the confirmed reserves of Caspian states after a three-year period. The first table was compiled based on data from Russian experts, the second is from BP.

The comparison of the oil reserves of Caspian countries (without Iran) in both tables shows approximately similar numbers. However during research dozens of numbers arose that provided contradictory data and complicated comparison. In further comparisons the author therefore only works with the statistical data of the largest energy company in the Caspian region – British Petroleum.

According to expert reports, the Caspian Sea shelf is both very promising and risky in terms of oil and natural gas extraction. It is promising in the sense that there are many undiscovered (research has not been conducted) potential oil deposits in the Caspian Sea (according to geological reports) which could provide significant capacities. Risky in the sense, that the invested financial resources might show that these deposits are not profitable. That means the expenses could outweigh the profits. Most often this happens when the capacity potential of a deposit is overestimated. Another source shows that there are 4 billion tons of confirmed and 30 billion tons of potential oil reserves in Caspian states (without Russia)[8].

## Natural Gas

It is necessary to point out the fact that even though natural gas is an equivalent energy source to oil its extraction, storage, transport, and sale differs in character. At present the significance of natural gas is growing much faster than the significance of oil. It is also important to note that while the oil trade operates in an open form, i.e. oil can be purchased on the world market based

---

[6] Ibid.

[7] Author maintains that the scientific use of the term 'potential' in relation to energy reserves should be avoided because this term is confusing.

[8] S.S. Zhiltsov, I.S. Zonn, A.M. Ushkov, "Geopolitika Kaspiskogo regiona", *Mezhdunarodnije otnoshenija* (2003), p. 128.

on a clear set of rules, the natural gas trade does not. There are no so-called futures in natural gas trade which means that the sale and purchase of natural gas is always a subject of political or trade agreements between two or more entities. Today the main question of the natural gas industry does not lie in extraction and processing but in the supply to end consumers due to a lack of transport capacities.

The allocation of natural gas can be mapped in North America, Canada, Russia, Africa, and the Middle East. The consumption of natural gas as one of the most utilized energy sources represented 28% of all energy consumption in 2008 (2850.8 billion $m^3$).

## Global Natural Gas Reserves

The confirmed global reserves of natural gas have increased 2.5-fold between 1980 and 2007. The increase in South America was 2.5-fold, in Europe and the former USSR states 1.75-fold, in Africa 2.3-fold, in the Middle East 2.9-fold, and in Asia and the Pacific 2.69-fold. In contrast during this period the reserves of natural gas decreased by 26% in the North American region.

*In the coming decades the global energy industry will focus more on the natural gas industry. Unlike oil and coal, natural gas is much cleaner in ecological terms and thus contributes less to heavy pollution.*

In natural gas reserves ranking, like in the case of oil, the first place belongs to the Middle East with a 40.5% share on world reserves. Europe and former Soviet states are second with a 35.3% share followed by Asia and the Pacific with a share of 8.2% and Africa with 7.5%. The last positions based on the size of natural gas reserves belong to North America with 4.4% and South America with 3.8% of world reserves.

Based on the IEA data from 2007 the largest reserves of natural gas are located in Russia (26.7%), Iran (15.2%), and Qatar (14.7%). The reserves of Caspian states, without Russia and Iran and despite considerable inaccuracies, are as follows: Kazakhstan 1.7%, Turkmenistan 1.6%, and Azerbaijan 0.7%. After the discovery of new confirmed natural gas deposits beneath the Caspian Sea shelf in 2008 Azerbaijan's share on global natural gas reserves increased to 2%. Due to differing data from statistical reports the information on confirmed reserves is inaccurate. For example, according to some local reports Azerbaijan's

**Table 4.** Natural Gas Reserves (confirmed) of Caspian States and Possible Future Reserves in millions of tons in Oil Equivalent

| State | Confirmed Reserves | Possible Reserves |
|---|---|---|
| Turkmenistan | 2520 | 3600-3960 |
| Kazakhstan | 1656 | 2250-2700 |
| Azerbaijan | 990 | 1800-2250 |

Source: A.M. Guliyev *Energy Carriers: Options and Prospects.* (Baku: Nafta – Press 2006).

share on global natural gas reserves approaches 5%. This data, however, are considered to be imprecise and the question should therefore be perceived with a dose of skepticism.

If one pays closer attention to the issue of reserves we can deduce a number of interesting facts about the natural gas industry. It is clear from the comparison of the global reserves of oil and natural gas that the natural gas reserves are several times larger than those of oil. This means that in the coming decades the global energy industry will focus more on the natural gas industry. Unlike oil and coal, natural gas is much cleaner in ecological terms and thus contributes less to heavy pollution. In a situation where the entire world is concentrating on the development of alternative energy sources, in concerns about the depletion of world oil reserves, natural gas can be a viable substitute to oil until a new type of fuel is discovered. The Table 4 compares the natural gas reserves of the Caspian Sea shelf without Russia and Iran.

The presented tables show that the confirmed reserves of natural gas in the Caspian states (approx. 5.2 billion tons) are larger than their confirmed oil reserves. Furthermore unconfirmed natural gas reserves approach the approximate volume of 9 billion tons.

One must take into account the fact that so far the largest discovered and processed deposit of natural gas on the Caspian Sea shelf is Shah Deniz in the Azerbaijani part of the Sea. According to CSIS data[9] (Center for Strategic and International Studies) there are 400-800 billion $m^3$ of confirmed reserves in this gas field. The gas field is located 100 km to the southeast of Azerbaijan's capital Baku. Besides natural gas, the Shah Deniz gas field also contains approximately 750 million barrels of gas condensates. In contrast to CSIS data the former president of SOCAR N. Aliyev[10] maintains that Shah Deniz contains 1.2 billion

[9] Zhiltsov, S.S., Zonn, I.S., Ushkov, A. M., "Geopolitika Kaspiskogo regiona", p. 119.
[10] *Caspian Energy*, Vol. VIII, No. 53 (2008), p. 21.

$m^3$ (1.08 billion tons) of confirmed natural gas reserves and 400 million tons of condensates. The exploitation of this deposit allowed Azerbaijan to become a pure exporter of natural gas. Up to 2008 Azerbaijan imported 4% of natural gas from Russia. The European market is the final destination of natural gas acquired from this gas field. Annual production of natural gas is estimated at 16-20 billion $m^3$. A new pipeline is being constructed over 690 km to ensure supply of natural gas from Azerbaijan to the Turkish and European market under the name South Caucasian Gas Pipeline – SCGP or Trans Caucasian Pipeline – TCP.

## Development of Global Natural Gas Production

Global production of natural gas increased 2.8-fold between 1970-2006. Annual growth amounted to 5%. This shows that apart from a few minor drops the production of natural gas has been increasing since the 1970s. The growth rate was highest in 1984. Annual growth of natural gas production was 3.68% between 1970-1975, 4.1% between 1975-1980, 3.73% between 1980-1990, 2.17% between 1990-2000, and 2.7% between 2000-2006.

Europe and former USSR states (without the Baltic States) are the largest producers according to the world production of natural gas. In 2006 2/5 of global natural gas production (40%) came from these regions. North America is second with 30%. Together these regions thus provide 70% of global natural gas production. Further ranking of world natural gas production is as follows: Asia and the Pacific – 11.9%, Middle East – 9.8%, Africa – 5.4%, and South America – 4.5%. Two fifths of global natural gas production is thus provided by OPEC countries.

In state rankings the largest producers of natural gas are Russia (22.1%) and the USA (21%). Natural gas production increased by 35% in Russia and 15.6% in the USA between 1985-2006. In oil equivalent terms global natural gas production accounted for 63.7% of global oil production in 2006. If we look back 20 years this coefficient would be 54%. This comparison clearly shows the pace of natural gas production growth. Current trends in the natural gas industry provide evidence that this development will continue and thus reach the level of oil production. Due to the fact that data assessing the total world consumption, production, and sale of natural gas only appears in expert literature (in this case annual statistical evaluations) after a delay of several years I am providing a table which shows the increasing tempo of global natural gas production from 1970 to 2006.

## Natural Gas Reserves on a Global Scale

Emphasis on the significance of world energy carrier reserves (in this case oil and natural gas) is important because, if we know at least the approximate amounts, it allows us to calculate how many years the world can continue to rely on these energy sources. Based on data available in 2007[11] global natural gas reserves should last for another 68 years.

If this statistical data is divided by the world natural gas reserves among regions these reserves would last the longest for the Middle East (approx. 280 years) and the shortest for North America (approx. 10 years). Africa has a solid position on this list with approximately 100 years worth of reserves followed by South America with 60 years, Europe with 62 years, and Asia and the Pacific with 45 years worth of natural gas reserves.

If this statistical data is taken under serious consideration the situation would be alarming in the case of North America, especially the USA (9.5 years worth of natural gas reserves) and Canada (9.2 years worth of reserves). Theoretically this could mean that in 10 years the USA and Canada could become completely dependent on natural gas imports.

The most favorable situation based on 2007 statistical data is in Qatar (approx. 837 years worth of natural gas reserves) and Iran (approx. 338 years worth of reserves). It is also necessary to mention the situation in selected European Union member states for comparison, for example, Great Britain has 7 years worth of natural gas reserves, Germany has 12 years, and Italy 16 years. The position of the Russian Federation in comparison with EU states and North America is a lot stronger. Confirmed natural gas reserves would last another 85 years for Russia.

The situation in the Caspian region is somewhat different. According to BP statistical data from 2005[12] the natural gas reserves in Azerbaijan are estimated at approximately 280 years worth of reserves, however after the discovery of the new Shah Deniz deposit this number could increase 5 to 10-fold.

In terms of self-sufficiency Kazakhstan's reserves would last another 160 years in 2005. In 2009 this number has increased to 290 years. Turkmenistan is another Caspian natural gas giant with approximately 300 years worth of reserves. In comparison with its neighbors (Azerbaijan and Kazakhstan) a considerably larger portion of Turkmenistan's natural gas is being exported.

[11] "BP Statistical Review of World Energy" (2007).
[12] "BP Statistical Review of World Energy" (2005).

However we must take into account the fact that this data was calculated based on the industrial development level of the given states for the respective year. These numbers cannot therefore be absolute and definitive because consumption grows exponentially with increasing industrial development in a state which greatly influences the aforementioned figures (self-sufficiency). Furthermore if the growing export of natural gas abroad is taken into consideration it becomes very difficult to calculate the real self-sufficiency of individual states in terms of natural gas.

## Global Natural Gas Consumption

In contrast to the development of world natural gas reserves the consumption of natural gas is growing at a very fast pace. Overall the share of natural gas in all the globally consumed energy sources is ¼. In the past 40 years the global consumption of natural gas has increased by 400%. In this time the annual consumption average of natural gas has increased by 47 million tons or 7%.

According to the table by the BP Statistical Review of World Energy[13] providing a detailed description of global natural gas consumption in the period of 1996-2006, the largest consumers of natural gas are the European region and former soviet states (11,382.8 billion $m^3$) representing 42% or 2/5 of world consumption. In the past 40 years the consumption of natural gas in this region increased 7-fold. In real terms this number means that the increase in natural gas consumption in this region was two times higher than the global increase.

The North American region is second in terms of global natural gas consumption. In the period of 1996-2006 the consumption of natural gas in this region represented 30% or 1/3 of world consumption (8,415.9 billion $m^3$). In the past 40 years the consumption of natural gas in this region increased 2-fold.

Asia and the Pacific region are third with the consumption of 3,543.7 billion $m^3$ representing a 14% share on world natural gas consumption. In the past 40 years the consumption of natural gas in this region grew by 60%.

Between 1966-2006 the consumption of natural gas in South America increased 8-fold, in the Middle East 23-fold, and in the African region 66.8-fold. For comparison during this period the consumption of natural gas only increased 20-fold in the EU Member States and grew by 524.7 billion $m^3$ in 2006.

[13] "BP Statistical Review of World Energy" (2007).

If one also looks at actors like Brazil, India, and China one will see the numbers which are very different from those in the EU (with the exception of Great Britain where consumption grew 123-fold). In the past 40 years the consumption of natural gas in Brazil increased 144-fold, in India 136-fold, and in China 40-fold. The top world consumer of natural is the USA with 619.7 billion $m^3$ in 2006. This number represents 24.3% of global natural gas consumption. In the past 40 years the increase in consumption amounted to 31.3%.

The consumption of natural gas is also growing in Caspian states except for Azerbaijan. It is interesting to observe that despite the discovery of vast natural gas deposits and 'economic development', as it is being discussed in various 'circles', the consumption of natural gas in Azerbaijan has decreased from 15.1 billion $m^3$ in 1986 to 8.9 billion $m^3$ in 2005 and only increased to 9.6 billion $m^3$ in 2006. This fact shows that Azerbaijan is not experiencing large industrial growth after the dissolution of the USSR, rather the opposite. Furthermore in the time when developed states prefer the utilization of natural gas in order to improve the global pollution situation Azerbaijan prefers accessible oil and oil products (mazut, heating oil, etc.).

*It is interesting to observe that despite the discovery of vast natural gas deposits and 'economic development', the consumption of natural gas in Azerbaijan has decreased from 15.1 billion $m^3$ in 1986 to 8.9 billion $m^3$ in 2005 and only increased to 9.6 billion $m^3$ in 2006.*

In Kazakhstan the numbers increased from 10.4 billion $m^3$ in 1986 to 20.2 billion $m^3$ in 2006. In Turkmenistan consumption increased from 14 billion $m^3$ (1986) to 18.9 billion $m^3$ (2006). If we take a closer look at the gas giants Russia and Iran, there is a stark contrast between the increases in their natural gas consumption during the period of 1986-2006. In 1986 Iran only consumed 15.2 billion $m^3$ of natural gas whereas in 2006 it was 105.1 billion $m^3$. That means that natural gas consumption increased 7-fold in 20 years. In Russia however this increase is only from 365.4 billion $m^3$ in 1986 to 432.1 billion $m^3$ in 2006 which points to rather minor developments in this industry.

In the past 20 years (1988-2008) the global consumption of natural gas increased 1.8-fold at an annual growth rate of 3.5%. If this tempo of global natural gas consumption growth continues, it can be assumed that the annual consumption of natural gas will increase by 68.95 billion $m^3$ = 50 million tons.

## Transit – Import and Export of Natural Gas across the World

The volume of imported and exported natural gas depends on its supply to the consumer. This factor is greatly influenced by the geography of natural gas trade. In this respect some experts focus on monitoring the natural and liquefied gas trade. At this point, the author would like to draw attention to the fact that natural gas is transported solely through pipelines and liquefied gas is transported in specific storage tanks.

For illustration and a better understanding of LNG significance let us present the technical parameters of liquefied natural gas.

Liquefied natural gas – LNG – is natural gas under high pressure, cooled at extremely low temperatures to gradually gain liquid form. When natural gas is cooled to -161 °C it becomes a clear, odorless, colorless, and tasteless liquid. Due to the fact that LNG only has 1/600 of the volume of natural gas in its gaseous state this form is ideal for transport in tankers across the world. A terminal for liquefied natural gas is an industrial facility used for the filling or emptying of tankers carrying this product. The largest exporters of liquefied natural gas are of course states with the largest reserves of this gas. These include Algeria, Australia, Indonesia, Libya, Malaysia, Nigeria, Oman, and Qatar.

At present there are 40 LNG terminals across the world intended for gas import. LNG is currently imported by Japan, South Korea, the USA, and several European states. Among these European states are Portugal, Spain, France, Belgium, Italy, Greece, and one terminal is also located in the European part of Turkey. As far as security is concerned, the risks connected to this energy carrier are derived from the three characteristics of LNG: *expansion, flammability, and extremely low temperature*.

In 2007, 549.7 billion $m^3$of LNG were exported and 226.41 billion $m^3$ imported. Across the globe LNG is exported by 12 countries and imported by 13. Russia is the largest exporter of LNG (147 billion $m^3$) and it supplies most of the EU states as well as former soviet countries. Canada is the second largest supplier of natural gas (107.3 billion $m^3$) and Norway is third (86.5 billion $m^3$). Looking at the other side, world importers of natural gas, the largest are the USA (108 billion $m^3$), Germany (83.72 billion $m^3$), and Italy (72.45 billion $m^3$).[14] It is necessary to take into account the important fact that while the USA and Germany are the largest importers of natural gas they are also its exporters (although not large exporters).

[14] All the data used in the paragraph are from "BP Statistical Review of World Energy" (2007).

According to the statistical data of the energy server *Energy Sources* the largest exporters of LNG in 2007 were Qatar (38.48 billion $m^3$), Malaysia (29.79 billion $m^3$), Indonesia (27.74 billion $m^3$), and Algeria (24.76 billion $m^3$). The largest importers of LNG were Japan (88.82 billion $m^3$), South Korea (34.39 billion $m^3$), Spain (24.18 billion $m^3$), and the USA (21.82 billion $m^3$). It is necessary to notice that Japan's import of liquefied gas alone accounts for approximately 40% of global LNG import.

This comparison shows how dependent individual states are on the import of this most-demanded energy source. In practice this means that state is as politically vulnerable as it is dependent on the import of fundamental energy resources (oil and natural gas). That is why most of the great powers (economic or military) try to carry out geological research on their own territory in order to discover as many sources of energy as possible. The axiom 'the more a state is self-sufficient in energy terms, the more invulnerable it becomes' has become valid in today's world politics.

*The state is as politically vulnerable as it is dependent on the import of fundamental energy resources (oil and natural gas). That is why most of the great powers (economic or military) try to carry out geological research on their own territory in order to discover as many sources of energy as possible.*

Energy carrier pipeline systems are also very important; these are networks of oil and natural gas pipelines. Current events in world geopolitics also increase the significance of transit countries on these networks.

As in other parts of the world the Caspian region is also covered by a dense network of energy carrier pipelines. The regionally important Turkmenistan – Iran (Korpeje – Kordkuy) pipeline can serve as an example. 5 billion $m^3$ of natural gas was exported to Iran via this pipeline in 2003.[15] This may raise a question about why Iran, as one of the largest natural gas powers (second largest world reserves of natural gas (15%)), imports natural gas from a practically 10 times poorer (in natural gas terms) state? The answer is that in some cases it is more convenient for a state to import gas from a neighboring state, when transit pipeline or gas fields are nearby, due to the high cost of natural gas transport. In such a case it is not profitable for the state to invest millions maybe even billions of dollars

[15] "BP Statistical Review of World Energy" (2007).

**Figure 1.** Baku – Tbilisi – Ceyhan (Oil Pipeline)


Source: www.deflow.com/.../consultancy_project1_1.gif.

to construct a pipeline in order to supply remote regions on its territory when it can ensure the import of natural gas from a neighboring state under favorable conditions. This natural gas import – export model is widely used not only in the Caspian region but all over the world due to its profitability.

The already mentioned Shah Deniz site is another significant and new project. This pipeline should provide natural gas supplies to the Turkish and European markets from the Azerbaijani sector of the Caspian Sea. At the moment the pipeline is referred to as the South Caucasus Pipeline. The pipeline spans 690 km from the Caspian Sea shelf to the Turkish border (through Georgia). 443 km of the pipeline is located in Azerbaijan. The pipeline copies the route of the largest regional oil pipeline BTC (Baku – Tbilisi – Ceyhan).

The natural gas pipeline became operational in 2008 and will transport natural gas from the Shah Deniz gas field. By the end of 2009 Kazakhstan and Turkmenistan should also join this project. This project is thus the second largest energy project in the region (after BTC). Its value rests not only in the ability to transport energy carriers to Europe, but also in its independence on Russia. This issue of 'having energy carrier pipelines independent of Russia' is one of the primary questions of Europe's energy policy. In order to receive oil and

natural gas supplies from the Caspian region it is first and foremost necessary to ensure their safe transit, whether through pipelines, tankers, or trains. The fact that the Caspian region is rich in terms of energy carriers is not sufficient – their transport is the key issue. The neighboring transit Caspian countries represent a significant influential factor in the security of transits. Here is one very good example for the understanding of this 'great game' in the Caspian region – the case of August 8, 2008. The Russian-Georgian conflict resulted in a considerable threat to the only 'independent' oil pipeline in the region BTC. The pipeline eventually had to be shut down for several weeks for fears of damage.

## The Significance of the Region in terms of Global Security and Consequences for the Global Energy Industry

It is necessary to mention that the Caspian 'pool' does not contain any other primary resources except for oil and natural gas. On the other hand, the Caspian region is rich in alternative energy sources which might help it to start a new stage of energy competition and keep it in the energy game after the current reserves are depleted.

The term Caspian Basin started to appear in expert literature after the dissolution of the Soviet Union in 1991. However, even today it does not have a precise definition which would present an exhaustive characteristic of the territory. There are multiple approaches to the delimitation of the Caspian region: geographical, geopolitical, transport and communicational, and the culture-civilization approach. From a Eurasian perspective the Caspian Basin is a part of a greater territory – Eurasia, where global processes take place. One approach lists nine states which belong to the Caspian region: Georgia, Armenia, Uzbekistan, and Turkey, which are all connected to the Caspian Basin with Russia, Iran, Azerbaijan, Turkmenistan, and Kazakhstan. In a narrower approach only the Caspian states form the Caspian region: Azerbaijan, Kazakhstan, Iran, Russia, and Turkmenistan. A broader approach then also includes other Middle Asian states such as Kyrgyzstan, Uzbekistan, and Tadzhikistan.

The discovery of energy resources in the Caspian Sea basin, their exploitation, transport to world markets, and the decrease in world oil production all prompt the world powers to focus on the security issues of this region. In the 1990s the Caspian region only represented an area of secondary interest of western countries; the 21st century changed the fate of the region and included it in the 'great game'.

When one looks at the current state of world energy policy we can only see an increasing hunger for oil and natural gas. The distribution of vast

energy reserves necessary for Europe now lie on the territory of Russia and its surrounding states. The transport of these resources is more and more often becoming a political question. This means that if Europe wishes to increase its independence on the above mentioned resources it must look for alternative routes and diversify its energy sources. The Caspian region can truly play a crucial role in this respect as an alternative source of energy resources for Europe.

## References

Antonov, B., " Konkurenty iz zapada", *Ria Novosti* (January 17,2008).

Litera, B., Hirman, K., Vykoukal, J., Wanner, J. *Ruské produktovody a střední Evropa*. (Prague: Bohemia, 2003).

"BP Statistical Review of World Energy" (2005).

"BP Statistical Review of World Energy" (2007).

Brendon, S., "Oil on Troubled Water", *Focus Central Asia. Caspian Energy,* No. 22 (November 30, 1995); www.caspenergy.com.

Daniel, Y. *The Prize*. (New York: Free Press, 1992).

Gadziyev, K.S., "Geopolitika Kavkaza", *Mezhdunarodnije otnoshenija* (2001).

Guliyev, A.M. *Energy Carriers: Options and Prospects*. (Baku: Nafta – Press 2006); http://www.echo-az.com/archive/016/economica.shtml#2.

Hetaguri, A., "Nacionalnyje interesi sovpodajut", *Caspian Energy* Vol. VIII, No. 53 (2008).

Shafranik, Y.K., "Neftjanaja Ekspansija v SNG", *Mirovaja energetičeskaja politika* Vol. 5-6 (2002)

Zhiltsov, S. S., Zonn, I.S., Ushkov, A. M., "Geopolitika Kaspiskogo regiona", *Mezhdunarodnije otnoshenija* (2003).

## The Renewal of Nuclear Power in Finland

By Matti Kojo, Tapio Litmanen. New York: Palgrave Macmillan, 2009.

The book edited by Matti Kojo and Tapio Litmanen reflects upon a question of nuclear energy in a time, when there has been a rebirth of discussion about this issue in the European Union. Especially for the Slovak reader, it is very interesting to read, how the decision to build a new power plant was reached in Finland.

The publication has a real capacity to improve European nuclear discussion by explaining the Finnish case. Although Finland, as a Nordic country, is specific in many aspects (I am referring for example to the consensus-based society or high level of democratic and transparent decision-making process), there are several theoretical, as well as empirical findings, that can be useful for argumentation in connection to nuclear power. Although the book has some shortcomings, which I discuss later, it clearly shows that the decision to build a fifth nuclear power plant was based on a long discussion in public and parliament and many aspects were taken into consideration.

The two hundred and fifty page long volume shows not only the reasons why the Finnish parliament adopted two laws on nuclear waste (2001) and nuclear power (2002), which meant renewal of nuclear energy and permission to build the fifth nuclear power plant, but also provides insight into the whole process. It deals with different issues from site selection, parliamentary discussion and reasoning for and against the nuclear energy to nuclear waste management and ecological issues. The book studies mostly the period from 1993, when the Finnish parliament denied the application for a new nuclear power plant, until 2002 when the decision was made in parliament to allow construction of a fifth power plant, but it explains also the development before and after this period. The book consists of 6 papers/chapters (plus an introduction and conclusion), which were written in the period from 2002 to 2009, when the book was published. These chapters are divided into three parts.

The introduction (first chapter) provides an overview of Finnish energy policy, its development and place in international context. It also explains why nuclear power is an attractive option for today. The second and third chapter, which are grouped under *The Application and Resistance* discusses the formal process of application for the construction of the nuclear power plant by an energy company, arguments that were used to support the application as well as the reaction of anti-nuclear NGOs for this application. According to Ari Lampinen, author of the second chapter, "Both the low cost and the rapid building time, with its implications

for fulfilling the Kyoto Protocol targets, were major arguments for receiving support from members of parliament" (p. 65). In contrast to the 1993 debate on nuclear energy, NGOs before the 2002 decision focused less on environmental and moral (risks connected to nuclear power) questions and stressed the economics of renewable energy sources. Harri Lammi concludes, that NGOs were in disadvantageous position, because they lacked knowledge in this area.

Why this shift in the approach of NGOs took place is explained by Annukka Berg in the fourth chapter, which belong together with the fifth chapter to the part called *Decision Making in Finland*. She shows how nuclear energy became environmentally friendly after the Kyoto Protocol, since it is emission-free and therefore NGOs could no longer use environmental argumentation against nuclear energy. Her chapter concerns with the decision-making process in the parliament and concludes that there has been a general shift in understanding nuclear power, from environmental enemy to climate remedy also among members of parliament (MP) and the public. "As nuclear power has been successfully defined as emission-free, choosing the nuclear alternative as a 'cleaner' energy source has become possible" (p. 122). The question of renewal of nuclear energy gained significant importance in parliament's decision-making process since it was declared to be an issue of conscience and MPs should vote according to their conscience, not their party line.

Erika Säynässalo in the fifth chapter discusses the Finnish nuclear energy policy in comparative perspective. She compared Sweden, as an example of a strong party state and France as an example of strong administrative state with Finland to explain the influence of parliament and other actors in the process of renewal of nuclear energy. She concludes that although Parliament is de jure the key actor when it comes to decision on nuclear energy, the Ministry of Employment and Economy has de facto the main say it this issues.

The last part of the book titled *Nuclear Waste and Societal Risks* deals with the process of site selection for the spent nuclear fuel repository (chapter 6) and societal risk evaluation (chapter 7). Matti Kojo provides us with a lot of dates, technical details and abbreviations of different companies and state bodies involved in the process of site selection for spent nuclear fuel repository, which are sometimes confusing and difficult to understand. The author shows, that geological factors were not the main ones for choosing the site for repository and "the decisive criteria were actually non-geological in nature" (p.185). Existing infrastructure, minimal need of waste transportation and the permissive political culture, which took into account interests of the nuclear industry on a local level were the most important factors in choosing the site.

In the last chapter, Tapio Litmanen answers the question why the Finnish parliament agreed to build a fifth nuclear power plant in a broader perspective. He argues that societal risk evaluation (the

way in which people perceive nuclear power as a threat) is rooted in culture, which is rather stable, but there are also dynamic changes in the society. The transformation that Finland underwent in the 1990s had an impact on the affirmative decision concerning a fifth nuclear power plant. The author analyzes several factors (political network, media, lobby, changes in values etc.) to show, that the change, which they underwent between 1993 and 2002, had decisive influence on the final decision.

The conclusion is without a doubt the best part of the whole book. It provides the reader with a concise but detailed and understandable summary of the volume. On the other hand, it is much more than a summary of individual chapters, it offers a comprehensive view on the issue of renewal of nuclear energy in Finland in chronological and complex perspective. To be honest, for someone who is not particularly interested in the topics, but would like to learn basic facts about it, it is enough to read this last chapter.

The book unfortunately does not provide an answer to a question which is quite interesting for those new member countries of the European Union that had to shut down nuclear power plants (or several reactors), as what happened with one of the Finnish nuclear power plants, which had a Soviet type reactor, after Finland joined the EU in 1995. The book in general focuses strictly on the domestic level of the decision-making process without putting it into the wider framework of the European Union. The missing European perspective is one of the main shortcomings of the book.

The book consists of papers, which were not mostly written for the purpose of this publication only and were previously published or served as Master or parts of PhD theses. In some of the chapters, it seems that the only thing, which connect them with the book, is the word 'nuclear', let it be used as a main reason for writing the chapter or just to illustrate some theoretical assumptions. Although a lot of the chapters are theoretically informed, they use different theories to explain their particular phenomena connected to nuclear energy. For this reason, the book cannot provide the reader with general theoretical findings or conclusions. Another shortcoming, which is probably the result of the nature of the book, is that some information is repeatedly mentioned, almost in every chapter, the chapters do not connect to each other in a logical manner, but often overlap not only in information but also in argumentation. Change in NGOs strategy in 2002 is just one example. The result is that for the reader it is rather difficult to find new arguments in the bunch of repeatedly used arguments and information.

To conclude, the book fulfils its promises from its headline. It provides a view on the renewal of nuclear power in Finland, but misses the opportunity to put the information in a concise and comprehensive form (with the exception of the conclusion).

Matúš Mišík
Department of Political Science,
Faculty of Arts
Comenius University, Bratislava

## Putting Teeth in the Tiger: Improving the Effectiveness of Arms Embargoes

By Michael Brzoska, George A. Lopez (eds). Bingley: Emerald Group Publishing Limited, 2009.

The publication *Putting Teeth in the Tiger: Improving the Effectiveness of Arms Embargoes* is a part of the *Contributions to Conflict Management, Peace, Economics and Development* series as a set of articles from an international team of authors with an international impact. The form of the publication utilizes a team of international experts which adds to the impact of every chapter analyzing various aspects of arms embargo implementation in great detail. The publication was prepared by ten authors from Germany, the USA, the Netherlands, India, and the Czech Republic following a pattern of the authors' areas of expertise either in the target countries of the arms embargoes or specific arms embargo mechanisms. The editorial leadership of M. Brzoska and G. Lopez, who are among the top researchers in the field of arms embargoes, their application, and especially their improvement, increases the value of the publication due to the fact that these authors are long-term respected experts on the matter in question.

The objective of the publication is somewhat revealed by the title and aim of all included passages, and is to contribute to the ongoing international discussion on the future of arms embargoes and targeted sanctions, their strengths and weaknesses, and especially the methods of their improvement. As referred to by the authors in multiple instances throughout the publication, they are well aware of the attention devoted, or rather not devoted, to arms embargoes in current international affairs. They are in fact being consistently overlooked by many and dismissed as feeble and only formal, which in turn leads to hindrances in their improvement, strengthening, and enforcement. Working in international relations research one can easily observe what issues make the top of the list for debate and the implementation of arms embargoes does not rank with issues like nuclear proliferation, or energy security, although it is quite clear which results in more casualties. The absence of broader systematic research and especially the results of this application are all the more alarming when the fact that arms embargoes form more than 80% of implemented UN sanction mechanisms is taken into account.

At this point one might see the value of this publication. The authors have taken under consideration both the above

mentioned facts about arms embargoes and the approach of international actors towards them and provide a detailed text from the position of arms embargo advocates. That is not to say they defend these sanction mechanisms out of pure optimism, rather that the publication as a whole provides constructive criticism of the subject matter. Weak points are not dismissed but rather pointed out with a set of recommendations and most importantly strong points are indentified through case studies and emphasized. This makes the publication a bit different from other case studies of arms embargoes or comparative and summary studies on implemented arms embargoes, such as some other BICC or SIPRI analyses. In simple terms it also points out to the reader 'what works' on arms embargoes and should therefore be pursued along with the improvement of weak points. After the usual news of arms embargoes being circumvented, disrespected, or even ignored, this certainly provides a refreshing look at this instrument of international security, which as the authors put it – is a tiger, but needs bigger teeth.

The publication was assembled by ten authors which is reflected in its structure, but first a few words on the utilized methodology. The publication is based on qualitative instrumental case studies with the selection of most important arms embargoes implemented since 1990. The authors have therefore chosen not only the most probable, but also the least likely cases to prove arms embargoes have strong points, i.e. the analyses include both cases where arms embargoes failed to a large extent and cases where embargoes were a success. Because success is a relative term, all the more in the case of arms embargoes, and might come under criticism the authors have included a set of parameters which provide a measurable scale both in qualitative and quantitative terms. The usual layman understanding of arms embargo success is whether or not arms transfers to the country under embargo ceased. Of course, nothing is as simple as it seems, and the authors have done a good job at reminding what the crucial parameters of success are including a note that the success cannot be absolute and will always be measured in relative terms of the inherent political law of costs vs. benefits. The chapter *Toward a New Framework and More Nuanced Criteria* is recommended for a full understanding of this mechanism. The qualitative research methodology described in the introductory chapters of the publication and implemented throughout the case studies of individual embargoes is complemented by a large quantitative chapter at the end of the publication. The chapter from M. Brzoska is a quantitative analysis of the effectiveness of arms embargoes, building upon the author's long-term work and experience and provides the reader with an alternative comprehensive research approach to the issue at hand.

In 2004 the arms embargos on Iraq were partially lifted after 14 years.

Although this step went somewhat unnoticed in the general media it presented a unique opportunity to analyze the effects of the arms embargo with a lot of input data which was furthermore verifiable by the prolonged international presence in the country. So, was the embargo in Iraq a success? Detailed and rather positive answers can be found in the second chapter of the publication co-written by G.A. Lopez and O. Bureš. Overall the embargoes ensured that Iraq's military strength was not renewed, although it is necessary to point out that a large quantity of small arms made their way into Iraq and became available to the general public through oil trades with Syria and Jordan. On the other hand, the embargoes prevented Iraq from obtaining WMD, advanced weaponry, and systematically arming its forces all of which corresponds with the authors' conclusions that the sanction regimes imposed on Iraq brought positive verifiable results.

The arms embargoes imposed on Yugoslavia and its constituent states during the 1990s represent a complicated case. At the time of embargo implementation Yugoslavia already was a large arms producer itself and most importantly its military and production strength was concentrated in Serbia and Montenegro. The arms embargo thus also had an impact on the course of conflicts in this region – a matter which is difficult to grasp due to the number of variables, but could also be examined more thoroughly. The effectiveness of the arms embargo decade is therefore rather ambivalent as W.C. Paes from BICC puts it, with some embargoes ranking among the most successful (1992-1995) while others providing less effective results (1998).

The following case studies include almost all imposed arms embargoes with a number of specific cases providing discernable incentives for the improvement of arms embargo mechanisms as well as targeted approaches based on individual case characteristics, which could be re-applied in similar scenarios. One of the traits necessary for successful arms embargo implementation is consistency on the part of its imposers. Inconsistency has for example led to Pakistan's possession of nuclear weapons as described by S. Kumar in the fourth chapter. Analysis in this case also points to the fragility of arms embargoes in scenarios where key actors do not partake in the sanction regime.

The continent of Africa is the target of most implemented arms embargoes and has therefore the greatest impact on the adjustment of arms embargo mechanisms. The four following chapters written by M. Wenzel, S. Faltas, W.-C. Paes, and M. Boemcken all focus on arms embargoes on the continent of Africa. Liberia, Sierra Leone, Angola, Congo, Eritrea, Ethiopia, Sudan, and others all present cases revealing aspects of arms embargoes which work as well as those which lead to their rightful criticism. While Ethiopia

and Eritrea represent successful impositions of arms embargoes leading to the cessation of hostilities and arms flow Liberia or Sierra Leone represent less successful cases and the authors offer a detailed analysis of the differences between these embargoes. It is tempting to list the wide range of factors influencing the effectiveness of arms embargoes in individual cases, because not all of them are as obvious as, for example, the presence of an international assistance force in the region or the absence of another conflict in the region, but the authors do a much better job at pointing out these factors with the support of concrete evidence in their work.

The publication comes to its finale in the chapter of M. Brozska. This quantitative analysis of all embargoes imposed since 1990 presents a counter-balance to the quantitative case studies but also a sort of summary of the effectiveness of individual arms embargoes examined throughout the publication on a ranked list. The chapter provides an exhaustive list of variables used to construct the list and derives from the author's long-term research. If the reader is interested in finding out which arms embargo was the most effective and why, this chapter provides easy access to 'which' and the abovementioned specific case studies provide a detailed 'why'.

The publication comes to its end in the chapter *Putting Teeth in the Tiger* – summarizing the entire aim of the book. The goal of the authors was to provide empirical evidence to the fact that arms embargoes truly are a potential 'tiger' in terms of available international instruments, as well as point out that the tiger needs a set of 'big teeth' to be able to make a difference in conflict management. The chapter thus includes a set of recommendations and conclusions derived from all the analyses to show how to fully utilize the potential of arms embargoes, prevent their dismissal, weak enforcement, or circumvention whether by the targeted countries, or the countries imposing the embargo.

In conclusion the book can be recommended to anyone interested in the issue of arms embargoes, international sanctions, or conflict management as it provides a complex analysis of the implementation, effectiveness, strong, and weak points of arms embargoes. The publication can serve both as a research tool for experts and an informative analysis for a better understanding of what makes arms embargoes a 'young tiger'.

Martin Chovančík
Department of International Relations and European Studies, Masaryk University, Brno

## *Guidelines for Contributors*

- The length of contributions should be between 3,000 and 7,000 words. Please submit articles in electronic form.
- Citations should be clearly gathered as footnotes following the format:
  ***for books:*** R. Scase (ed)
  *The State in Western Europe.* (London: Croom Helm, 1980), p. 87.
  ***for articles:*** F. Attina, "The Voting Behaviour of the European Parliament Members and the Problem of the Europarties", *European Journal of Political Research* Vol. 18, No. 9 (1990), p. 557.
- Articles should also include references.
- Articles should be in English or Slovak language. We assume that authors, who are not native speakers, will accept language editing.
- Articles will be reviewed by the editorial board. Broader changes to the text will be consulted with the author.
- Editor reserves the right to structure the text by adding sub-headings, unless this is already done by the author.
- We also welcome reviews of new books (1200-1500 words).
- For submission or correspondance, please contact:

  **I**nternational **I**ssues
  & **S**lovak **F**oreign **P**olicy **A**ffairs
  Hviezdoslavovo nám. 14
  811 02 Bratislava 1
  Slovak Republic
  Tel: +421 2 5443 31 57
  Fax: +421 2 5443 31 61
  E-mail: brezani@sfpa.sk
  strazay@sfpa.sk