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Energy Security in International Relations - Part B: Case study of the relationship among European Union and Russia in the gas sector

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Preface

Energy security has gained a new momentum in the field of International Relations. This can be attributed to recent developments (they will be analysed in the first chapter), which have contributed to the transformation of the global arena and led to the sudden increase of interest of nations in the matters of security. The first part of the working paper serves as a general introduction to the topic, with an historical account presenting the origins of this issue and the events that led to its renewal in the latest years (1st chapter). Then, it presents the problems concerning the adaptation of a common definition (2nd chapter) and examines how energy security can be incorporated in the field of the International Relations (3rd chapter). The second part is a case study that looks into the relationship between Russia and the European Union regarding the gas sector, studies the "nature" of it and the applicability of International Relations theories, according to theoretical background that has been previously presented.

Energy security is an issue of highest significance to the nations. This resolution stems from the way the states have treated this topic in the past. Even the smallest possibility of a threat to their energy system is treated with utter importance. This is reasonable considering the modern dependency of states and people on energy products. They are being basically used in almost every aspect of the modern life as transportation, heating or cooking. They are also needed for the well- functioning of sectors essential to the states like economy (production, distribution) or military (military vehicles). So, any disruption to the supply can cause undesirable consequences that nations try to avoid and deter, thus, making energy security a priority for the national interest.

However, despite the growing value of energy security, there are still some problems that have still not been resolved. For example, there are many definitions and disagreements regarding the correct approach to the matters of energy security. Furthermore, new issues have emerged in the global scene like energy terrorism or climate change that haven't been yet researched or addressed. So, energy security due to its high complexity and multi-dimensional nature, is in demand of further examination to be better understood and integrated in the field of International Relations.

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1. Case Study.

This paper constitutes a case study, where the case serves as an example to illustrate a phenomenon (Gerring, 20014, p. 341). The case at hand here is the relation between the EU and Russia regarding the gas sector, and the phenomenon at large aims to examine if theories of International Relations can be used to describe the nature of the relationship between the two powers. The purpose is to shed some light on the mechanisms and polices that determines whether there is a relationship of interdependence between the two powers, and the determination of the theory of International Relations, which has the biggest rate of applicability to the case. Although the existence of long lasting cooperation in the gas sector, the developments of the last decade (gas crises of 2006, 2009, 2014) has altered the conception of energy security of both sides, thus, making it a pressing matter.

This paper employs the case study design to illustrate the discrepancy throughout the years between the perception of energy security by the EU on the one hand, and the energy policy followed by the Russian government on the other. The case in question is whether neorealism, neoliberalism, radical approach or constructivism, are in the position to provide an explanation to the phenomenon. Moreover, the case study describes the policies and strategies employed by both sides to tackle their energy security issues. It also seeks to answer the questions: Is the dependency of the EU on Russian gas unhealthy? Is it a case of inter-dependency or exploitation for Russia?

However, before proceeding to answer, what should be considered is the level of representatives. As stated in Erving, “Since the aim is to be able to infer something general from what is studied, the question then becomes: is the chosen case representative of the phenomenon that is intended to be explained?” (Erving, 2014). The implicit argument in this paper is that the four theories of IR are capable of giving a partial explanation to the strategies of EU and Russia to achieve energy security. The motivation for choosing a case study is to reaffirm the theoretical framework presented in the 1st part with a practical example. The case study approach, in other words, allows for a descriptive and explanatory analysis which is considered fertile ground for achieving the objective of this study.

1.1. Units of Analysis.

To evaluate how the hypothesis in this paper holds up, a few units of analysis that highlight the problematic have been selected. Three main instances have been chosen in order to understand if theories of international theories are efficient in explaining the relations of EU and Russia regarding the gas sector. First of all, the history and strategies of EU to achieve energy security has been selected as an example of a country that is dependent on export of energy products. In addition, the goal of EU of creating a fully-liberalized energy market is a fine example of neoliberalism as presented in the works of Keohane, Furthermore, the diversification efforts by the EU to secure its supplies are cases where EU has followed a neorealist approach to its energy issues. Secondly, the energy policy of Russia, which has been also chosen illustrates the practises to apply political pressure by a country producer in order to maximize or protect its national interests. Lastly, the paper focuses on the nature of the relationship of EU and Russia, and the measures and policies that they have adopted so as to continue, reduce or increase the level of interdependence or exploitation between them. These cases are in turn built upon observations of the decision made by member states, the EU and Russia (Gerring, 2004, Erving, 2014). What constitutes these units of observations is discussed below.

1.2. Techniques.

In order to meet the demands of the paper, the technique of process tracing has been chosen. This approach puts emphasis on the decision process, in this case the policies or strategies followed by the European Union and Russia to increase their energy security and their effort to tilt the balance of their energy relationship in their favour. Moreover, the outcomes of the measures adopted by the two 'players' are also indicators of the approach they have towards energy matters and International Relations. This technique is considered to be the most fruitful one when analysing the motivations behind the nation policies studied (King et al, 1994). Evidence supporting the hypotheses that has been presented are sought in the decision making process

(according to the material presented in the next subchapter). Whether the cooperation of Russia and the EU in the gas sector can be better explained by neorealism or neoliberalism or even constructivism and radical approach, the decision process is the one to provide explanations about the true motivations of the actors involved. The motivation of actors thus make clear the perception they have about the nature of their relationship (always concerning the gas sector) and its future (Erving, 2017). Process tracing also guides the selection of material in that the documents that refer to the decision process, are of the highest priority. Last but not least, the observation regarding the outcomes of the aforementioned decision process is the ultimate test for the hypotheses, as they can either support or refute them (Kings et al, 1994).

1.3. Data.

The material chosen presents the decision process and the motivations behind it. Moreover, it is also influenced by the units of analysis that are being put 'under the microscope'. Therefore, as for the strategies of the EU pertaining to secure the supply and to increase its energy security level, official EU documents are used. As for policies followed by Russia in its energy sector, official Russian documents are used but also due to small amount of them, the material also consists of analyses, articles or reports conducted by political analysts or international organizations. The choice of this data is influenced by the goal of understanding the mechanisms at play by consulting documents of this kind. The official documents illustrate clearer the motivations that shaped the process of decision making of the actors involved, which will be further discussed in the analysis section of the paper (Erving, 2017). Simultaneously, it could be argued that the official documentation is not subjective but serve as 'cosmetic communication' (Erving, 2017). Therefore, it is important to point out before advancing that the data used in this paper does not manage to present all the mechanisms deployed by EU and Russia but it provides useful insight for the undertaking.

2. Material.

In order to confirm the hypotheses, the data, which will have a supportive role in this process, needs to be laid out beforehand. “How is support for the hypotheses to be measured?” (Erving, 2017). Firstly, the aim of the study, the phenomenon, is the applicability of theories used in the field of International Relations to matters of energy security. As energy security (according to the definition of Cherp and Jewell, 2014), is the objective, the empirical focus will be on the strategies, employed to achieve it by the EU and by Russia, and whether they are compatible with the doctrines of neorealism, neoliberalism, radical approach and constructivism. To be more accurate, the focal point concerning energy supply is the natural gas supply as it serves better the purpose of the paper.

There will be a description of instances where security of supply has been sought by the EU and by Russia respectively. The EU have adopted many measures, collectively always, in order to counter-balance the strategies followed by Russia. It is trying to “speak in one voice” concerning its energy issues, while Russia seeks to exploit the divisions inside the EU in order to maximize its gains. The multilateral cooperation promoted by the EU to secure its gas supplies and create an effective ‘united front’ to tackle policies of Russia, have proved to be either unrealistic or unappealing as many member states have proceeded to form bilateral agreements with Russia and other producing countries. In the parallel, the growing demand for energy products in the EU and the ‘weaponization’ of energy by Russia has caused the topic of energy security to resurface. Therefore, while the EU seems to adopt a more neoliberal approach, Russia is strictly sticking with the neorealist paradigm.

Thus, to meet the requirements of the hypotheses set in this paper there is a need to address several issues. Firstly, the theoretical framework aforementioned in the first part of the papers is briefly described to establish the fundamentals for the other chapters. Secondly, the distinctiveness of natural gas to the other energy sources is being examined. Moreover, matters concerning its well-functioning and arising trends, which may have a future impact on the relations of the EU and Russia in this sector, are being discussed. Thirdly, the measures and policies adopted by the EU to

secure its energy supply on one hand, and the strategies of Russia to use its energy resources as a tool of political pressure on the other, are being presented. Fourthly, it is analysed the ability of theories of International Relations as neoliberalism, neorealism, radical approach and constructivism to explain the nature of this relationship and generally issues of energy security. Finally, after the empirical material has been presented, a brief discussion on reliability and validity concludes this chapter.

2.1. Theoretical Framework

2.1.1. Definition of energy security.

The definition of energy security used in this paper is ""low vulnerability of vital energy systems. Vital energy systems are energy resources, infrastructures and used linked together by energy flows that support critical social functions. They can be delineated by sectoral or geographic boundaries. Vulnerabilities are combinations of exposure to risks and resilience capacities. The three perspectives on vulnerabilities are rooted in different policy problems and different scientific disciplines" (Cherp and Jewell, 2011, 2013) provided by Cherp and Jewell, as it is the most suitable for the purposes of the paper.

The reasons that led to the choice of this definition are several. Firstly, it has been recently developed and has been inspired by recent events, thus making it more credible and applicable to modern problems. Secondly, it has 'absorbed' the theoretical fundamentals of the already existing theoretical framework (as presented in the first part of the paper) but simultaneously it has developed them further (by adding new specifications as vitality of energy systems and their vulnerabilities) and addressed some weaknesses they were facing (lack of applicability in security studies). Thirdly, the definition was formulated on the ground that it would be applied to matters of energy security as Cherp and Jewell took into consideration the general definition of security by Baldwin of '97, before proceeding to the creation of their definition.

2.1.2. Neorealism.

The brand used in this paper is based on the structural realism as presented in Waltz's book "Theory of International Politics". Since 1979 many brands of neorealism have emerged, however due to the topic examined and the need for a less military approach, "defensive" neorealism seems to be the most suitable for the purposes of the paper. The European Union and Russia despite the expansive moves by the latter, have not been found in direct confrontation. Moreover, the strategies of diversification by the EU on one hand and the target of a bilateral approach with member states by Russia on the other hand, present an interesting example of defensive neorealism in pratice thus, justifying its usage in this paper.

2.1.3. Neoliberalism.

The brand used in this paper is based the book of Robert Keohane, "After Hegemony" in 1984. The strategies followed by the European Union concerning its gas sector resemble the doctrine of neoliberalism. The adoption of the Third Package of measures concerning the internal gas and electricity market in the European Union revealed the effort of the EU to further open up the gas and electricity markets in the European Union (European Commission, 2015). In addition, past treaties as Energy Charter of 1991 demonstrate the European belief in a multilateral solution to secure its energy supply. However, the refusal of Russia in 2009 to ratify the treaty has undermined the prospective of a closer future cooperation in a multilateral context.

2.1.4. Radical approach.

The radical approach was originally mostly associated with Marxism but now, due to the inability of the theory to adjust to modern social and political problems, it is depicted as a Marxist-inspired critical approach to International Relations. The goal of the radical approach is to be critical of neorealism and neoliberalism as they don't address all the problems the international system is facing. In this seeting, Russia can

be perceived as a 'player' that uses its energy resources to resist from the dominance of capitalist countries as member of the European Union. Therefore, the participation in a multilateral agreement with the EU would simultaneously mean the yielding of its sovereignty to Western powers.

2.1.5. Constructivism.

Another significant theory in International Relations, which have challenged the way political scientist approach the field, is constructivism It was developed in North America in the beginning of the '80s, and it was strongly influenced by other humanitarian studies like sociology and psychology. In this paper, the aspect of the constructivism examined is presented based on the works of Alexander Wendt. The factor that distinguishes constructivism from other theories is that it doesn't focus on the material aspect of the international system. Therefore, the core of the studies of the international affairs should not be power but the ideas and beliefs of the actors and the shared understanding between them (also, not material).

The same principle can be also applied in the case study of energy relation between the EU and Russia. The Eastern member states of the EU have a negative image of Russia, thus, promoting the need for diversification. In the parallel, Germany and many other Western powers as the Netherlands have signed bilateral agreements with Russia that enhance the rate of dependency, e.g. Nord Stream II due a more positive perception of the country. So, constructivism is used in this paper to tackle the social feature of the energy relationship of the EU and Russia, which is largely omitted by neoliberalism and neorealism.

3. Natural Gas.

It is vital before proceeding with the examination of the case study to understand all the issues being examined further. As it is a case study that describes the energy policies of the EU and Russia, and also their relations concerning the gas sector, there is a need to discuss the energy product itself, which is the natural gas. There are several queries regarding that have arisen and require explanation as:

- What is natural gas?
- Why gas has become more popular in the last years?
- What is the distinctiveness of gas to the other fuels?
- What are the modern problems or trends that it is facing?
- What is LNG (Liquefied Natural Gas)?

Therefore, this chapter aims to provide answers to these questions and to develop a better comprehension of the topic.

3.1. What is natural gas and how is it extracted?

The process of creation of natural gas is similar to coal and crude oil. It was formulated millions of years ago when large quantities of plants and animals were buried amidst sand and rock deposits deep underground (Blaziev, 2013). Those layers of sand, plants and animals under the influence of heat, pressure and mostly time turned the dead matter into fossils-coal, oil and natural gas. Thus, natural gas is a hydrocarbon that consists of a mixture of primary methane but also but commonly including varying amounts of other higher alkanes, and sometimes a small percentage of carbon dioxide, nitrogen, hydrogen sulphide, or helium (Blaziev, 2013).

The process of extraction and processing is perfectly described by Thomas Edwin, “Natural gas extraction begins with drilling a well…. In a typical operation, the well is drilled, a concrete and metal casing is installed into the hole, and a collection pump is installed above it…. After being brought up from its subterranean deposit, the raw

natural gas is first transported to a collecting point. Here, pipelines from all adjacent wells bring the raw gas together for pre-processing, which removes water and condensates. Then it is almost always pipelined to a processing plant. If this is not feasible, the gas is pumped into an underground storage facility for future pipelining and use. It is too expensive to liquefy raw natural gas for shipment to a refinery, and this is rarely, if ever done… Raw natural gas is mostly made of methane, but also contains a large number of other hydrocarbon gases. The first stage is to remove acid gases by amine or membrane treatment. This acid is usually processed into sulfur products. Then any remaining water is removed, which is followed by the removal of mercury by filtering the gas through activated carbon. Finally, nitrogen and natural gas liquids are taken out by low temperature, cryogenic distillation. This results in the "natural" gas that is used for cooking and heating in homes (Edwin, 2017).

3.2. The emergence of natural gas.

In the 19th and early 20th centuries, natural gas was used primarily for street and building lighting, providing what was known as gaslight. Since then this fuel has gained an increased significance in the global arena and it has literally transitioned from a marginal and supplementary fuel used mainly in disconnected markets to a fuel that is being transported worldwide through a perplex system of pipelines and utilized in many economic sectors (Victor, 2018). Moreover, the improved distribution of gas has made it possible for it to used more broadly in homes, businesses, factories and power plants.

The positive momentum that natural gas has obtained doesn't seem to be slowing down. For example, the US Energy Information Administration projects a 50 percent rise in global natural gas consumption between 2010 and 2035 (US Energy Administration, 2011). The sudden growth can be attributed to many factors.

First and most important, there has been a rapid development of technology allowing the recovery of natural gas from shale formations (Speight, 2017). The development by Barnett in the 80s of new techniques that combine the use of horizontal drilling

with hydraulic fracturing has had a positive impact on the process of production of natural gas by making it more efficient and less complex, thus reducing its costs and renewing the investments interest in the sector (Speight, 2017). The technological leap led to the abrupt increase in the production of natural gas and created changes in the global gas market to the point that it has been characterized as one of the most interesting innovations in the global energy market of the 2000s (Speight, 2017).

Secondly, the crisis of 1973 had also an impact on the higher use of natural gas. The oil shocks caused by the members of OPEC reignited the fear over energy supply in the Western powers. The importers were reminded that oil can be used as a tool and 'weapon' to apply political pressure. Furthermore, the core of oil production was located in the Middle East. The region was and it still suffering from esoteric political transitions and general instability, thus creating a feeling of unsettlement regarding the supply of the energy flows. Therefore, the countries consumers proceeded to not only adopt measures and policies that will protect them from similar future scenarios but also help them diversify their energy mixes.

Natural gas was preferred as an oil alternative because of the low level of technological advancement in the sector of renewable energies back then, and the fear of the nuclear power due to the Chernobyl catastrophe of '86. In addition, most actors and analysts tended to regard natural gas as low risk fuel, and the possibility of it turning to an 'energy weapon' was rejected (Hogselius, 2015). Gas companies also didn't hesitate to take far-reaching precautionary measures that would protect them from any short-term or long-term disruption in the gas supply. This included both institutional measures (such as paragraphs in the gas contracts specifying penalties to be paid in case of supply disruptions) and technical measures (like the construction of underground gas storage facilities) (Hogselius, 2015). That created a feeling at that time that gas imports were secure.

Thirdly, natural gas is the cleanest burning fossil fuel and is being used throughout the world to reduce carbon dioxide emissions. Compared to coal, natural gas produces far fewer carbon dioxide and sulphur emissions (Blaziev, 2013). As aforementioned before in the first chapter (p.16), the effects of the climate change are getting more

and more visible and destructive for the countries. Thus, environment has started to be more relevant, when discussing issues of energy security. This can be seen through global initiatives as COP-24, which have aim to limit and control the pollution, or the diversification of the energy mixes bythe states that promote greener sources of energy. An example of the latter is the European Union, which is constantly promoting its goals of sustainable development (2020 Climate & Energy Package). Despite the technological advancements that occurred in the field of energy renewable, they are not in the position to cover the global energy demand in a satisfactory way, thus, making natural gas the only possible greener solution.

While the distinctiveness of natural gas from oil has proved to be beneficial for the former in some cases, in others it has practical restrictions obstructing the expansion of its use, “The security aspects of natural gas are similar, but not identical to those of crude oil. Compared with imports of crude oil, natural gas imports play a smaller role in most importing countries—mainly because it is less costly to transport liquid crude oil and petroleum products than natural gas. Natural gas is transported by pipeline over long distances because of the pressurization costs of transmission; the need to finance the cost of these pipelines encourages long-term contracts that dampen price volatility” (Speight, 2019).

Therefore, the creation of energy relations in gas sector between two actors is not something that should be taken lightly but it requires a set of parameters so as to be successful. Firstly, the region, where the gas system is built should be characterized by stability, because any possibility of conflict could lead to disruptions in the supply of energy. Secondly, there is a need of huge financial investments for the utilization of the plans of energy systems. Thirdly, the actors collaborating on the project should have good political relations. However, the distinction of modern states between issues of high and low policy has affected this criterion. Despite disagreement in their foreign policy, states can still collaborate on matters of energy and economy, e.g. Germany and Russia are building the Nord Stream 2. Fourthly, they need to be equipped with advanced technology and to be in accordance with the global regulations. Last but not least, it is also of high importance that the actors should have

not been prone to political turmoils. Nevertheless, the control of gas resources by gas companies in most of the countries has positively restricted this probability.

3.3. Natural Gas in the modern era.

In the begging of the 21st century the role of gas has not decreased. As stated by the Blazev, "Natural gas is a fuel of the future. World consumption has tripled over the last thirty years, and demand could grow another 50 percent over the next two decades. Its share of the total energy market is also growing. World consumption on an energy equivalent basis was only 45 percent that of oil; today it is about 70 percent" (Blazev, 2013). The reasons are obvious and many.

Firstly, it is a low carbon resource (Blazev, 2013). The renewable energy resources are still incapable to satisfy the energy demand of the market (Medvedev, 2011) and the technology is very expensive. Furthermore, the renewal of interest in the nuclear power was again brutally destroyed by the malfunction of Fukushima nuclear power plant.

Secondly, "oil resources are gradually running dry, and new oil fields are less accessible, hence, the cost of "black gold" is increasing. On top of it comes the large polluting effect of the use of petroleum and petroleum products. As for coal, it is abundant but it is fundamentally impure and, in this case, the ecological considerations are paramount" (Medvedev, 2011).

Thirdly, Middle East has remained an unstable region. Despite the constant economic initiatives with the aim of boosting the regional economic progress and development and signing of bilateral or multilateral agreements, the countries consumers have still reserves concerning their energy relations with the regional states. Long-term instability, possible spreads of political turmoil in countries of the region, all of it poses risks to the supply of energy markets (Mendvedev, 2011). Moreover, recent occurrences as Arab Spring of 2011, the rise of extremism, civil wars in Yemen, Libya, Sudan, have reinforced the belief that the supply of energy products from this region should be treated with extra carefulness and should not be trusted.

3.3.1. New trends and problems.

As aforementioned before natural gas has been in use for hundreds of years, but due to the factors stated above (p.xixviii) it started to be more popular and to play a more central role than before when it was just considered to be a supplement of oil. However, the constant increase of its demand and production has also led to the emergence of new phenomena that are both negative and positive, and have not been observed in the past.

The new trends and issues concerning natural gas are relatively recent, thus making their examinations and understanding challenging. The lack of data and the inability to predict their consequences have put some restriction regarding their research. In addition, despite the interest of international actors in the security of their energy supplies, the academic community has mostly tied energy with sustainability and it has focused on its 'greener' aspect due to the increase attraction to environmental topics, thus affecting the collective confrontation of energy security matters.

However, this doesn't mean that the importance of the new developments has to be undermined and their impact neglected. Trends like liberalization of the gas market has hugely influenced the energy policy of the member states of European Union and their perception of the future of the European Energy Union. Also, the discovery of shale gas and LNG, which don't need the construction of huge energy systems or the signing of long-term binding agreements, could prove to be crucial for the future of the countries consumers. Moreover, recently there have been observed terrorist attacks on gas facilities. Till now, energy terrorism was mostly associated with oil, due to its significance for the well-functioning of the states in the past (the crisis of '73 had negative consequences for the global market) and its identification with the Western values and capitalism (Bossi, 2017). Nonetheless, the increasing demand for natural gas, the vulnerability of gas pipelines and the growing dependency of Western states has sparked the interest of terroristic groups.

3.3.2. Market liberalization.

The ongoing liberalization, which has occurred in many gas consuming countries, combined with the growing demand for the fuel has caused a global concern. Traditionally, states had the monopoly on their energy sector so as to better secure their energy supplies. Nevertheless, due to ongoing developments (explained later) the role of government has now changed-away from builder, operator and financier of gas projects and toward a greater role as regulator and creator of the context for private investment (Victor, 2006).

The gas industry has become global and akin to commodity. “Gas-on-gas competition, new gas resale contract clauses and joint investor/host country spot marketing strategies are creating new uncertainties that are creating a new market structure for gas” (Victor, 2006). Therefore, the weaken role of state and its transfer of reasonability of gas projects to private sector seems as a reasonable outcome. “In the old world, the governments had deep pockets and a strategic vision that was organized around serving national markets and developing national resources. The development and implementation of this vision was often inseparable from the state owned and supported enterprises whose charge it was to supply energy to the national market. In that world, projects were national ventures “(Victor et al., 2006).

In the new world, the emergence of large energy companies with ‘deep pockets” and similar strategic vision has proved to be crucial for the continuity of the monopoly that the states have previously enjoyed. These new players are largely private, but they also include national energy enterprises that are now playing a larger role in the international marketplace – ENI, Petro-China, Petrobras and others (Victor, 2006). The biggest implication and consequence of this change has been the transition from national energy security objectives to commercial interests (Shepard and Ball, 2006).

The end of highly structured gas world of government-backed bilateral, fixed- price contracts and the beginning of new world of private, market- related contracts has raised concerns about national security of supply worldwide. As private sector participants have different interests from countries, they cannot be expected to

consider automatically the energy security concerns of client nations due to their commercial considerations (Shepard and Ball, 2006).

However, the solution to the problem does not mean the adoption and the return to 'old-school' mercantilist ways and measures as it would be not only inefficient but also 'out of touch' with the modern international market. Many global players have decided to follow more progressive policies to control the ongoing liberalization of the global gas market. For example, there was the idea of the formation of a gas cartel similar to OPEC. In May 2001 the Gas Exporting Countries Forum (GECF) held its first ministerial meeting in Tehran with the aim to enhance coordination among gas producers. Moreover, the EU, which has already a great level of integration among its members, promoted further liberalization of the energy market. The vision of a united and secure European Energy Union with accordance to the doctrine of neoliberalism was the main driving force behind the adoption of the Third Energy Package in 2009.

Nevertheless, the state is not ready to yield its power to multinational institutions. Despite the efforts of European Union to create a common and transparent energy market, its members still prefer to maintain a tight grasp over their energy supply, as the example of the Nord Stream II has shown. In addition, the USA, which are the forbearers of neoliberal values, have under Trump returned to old-fashioned protective polices casting a significant blow to the achieved progress in energy and trade related issues. Also, the initiative of GECF proved to be not fruitful as its members with diverging interests to exert effective constraints on capacity expansion projects in the near term. It is likely to be a decade or more before they can assert sustained monopoly power in world gas markets, leaving consumer countries ample time and opportunity to adopt countermeasures.

3.3.3. The new significance of gas security.

The natural gas produced in countries producers is transported through major gas pipelines to their importers. Due to the vulnerability and length of those systems of gas pipelines, companies and states have greatly invested in securing their stable

operation. Therefore, progressive methods of diagnostics, scheduled maintenance, and repairs have been introduced for this process.

Moreover, the constant developing of new technologies has proved to be helpful in the goal of implementing more advanced technical upgrading of natural gas transmission lines, compressor stations, and underground storage facilities, thus increasing either the efficiency or reliability of gas as a fuel.

Nonetheless, the adoption of internal measures does not guarantee the everlasting security of the pipelines. A report submitted in 2005 by the Russian Federal Service for Environmental, Technological, and Nuclear Oversight (FSETNO) highlighted the arising threats to the integrity of major pipeline transmission facilities. Despite the considerable amount of time that has passed since the submission of this report, the dangers that it presents are still relevant.

Firstly, “natural gas transmission pipelines are far more susceptible to external corrosive attack than similar operating oil pipelines. To explain the difference, it is proposed that the internal liquid content of the natural gas transmission pipeline may actually promote corrosive chemical reactions on the outside steel surface of the pipeline” (Haukeness, 2017). Taking this into consideration and that many of the major gas pipelines were constructed 20 or more years ago, there is a problem of intensive development of stress corrosion process due to the deterioration of the protective sealant coating (Serebryakov, 2005). This could have a negative impact on the well-functioning and reliability of supply.

Secondly, many of the major gas pipelines pass through countries that do not have effective system of technical monitoring of design specifications, thus causing accidents due to shoddy construction and installation. In addition, the parameter of time aforementioned above combined with the lack of technical knowledge and maintenance affect the integrity of the pipelines (FSETNO, 2005). Therefore, an incident in one part of the system immobilises the whole energy supply.

Thirdly, there has been a significant growth in the number of cases of unauthorized connection to oil and petroleum product pipelines with the aim of stealing the

products being transported (Serebryakov, 2006). The thefts is not something new as they have been already been observed in the past, e.g. many guerilla groups that were active in Latin America during the 80s, e.g. FARC and ELN, deliberately stole oil from the Cano Limon pipeline, but its sudden growth has alarmed the gas companies and the states in case of a spill-over effect especially after considering that the phenomenon has been particularly acute in republics of Dagestan and Chechnya; Samara, Nizhny Novogrod and Saratov oblasts; and Stavropol and Krasnodar territories, where many gas pipelines also pass through (Serebryakov, 2006). Moreover, accidents like this of Khadyzhensk-Psekupskaya-Krasnodar, where main oil began discharging oil into the Chiby Canal, caused by thieves making unauthorized access to pipeline proved to be harmful not only for the supplies but also for the ecosystem.

Fourthly, after September 2001 terrorism is a new parameter that is being taken into account concerning matters of security of pipelines. There has been sharp a rise of domestic attacks against energy facilities. The attempt of radical elements to inflict damage to the 'veins' that power the imperialistic powers in the region has seen intensification in the last decades , e.g. in 2007 Al-Qaeda was calling its followers to strike against petrol and facilities on a global scale so as to froze the American economy. Obviously, as in the case of petrol theft, the possibility of terrorist attacks on their gas plants has alerted the gas companies.

However, "individual terrorist acts have been already carried out against pipelines in Russia during the period of military actions in Chechnya. On April 15, 1996 a bombing severed a major natural gas pipeline 1,2000 militers in diameter on the left bank of the Terek River in Shelskovskaya Region in the Republic of Chechnya. When the explosive device was detonated near where the gas pipeline emerges from underground, the entire pipeline was blown off its supports…. The pipeline break led to a fire that burned a total of 25,000 square meters on both banks of the Terek River" (Serebryakov, 2006).

Several other cases have been observed since then, thus proving the continuity of the threat, and also its deterioration. Pipelines are a convenient target for terrorists,

inasmuch as a simple explosive device can knock them out of commission for weeks (Serebryakov, 2006). Moreover, they spread for kilometers (making their safekeeping troubling), they pass through unsafe zones (Chechnya, Iraq) and can be easily used as pressure points for political goals. It is for this reason that have become targets.

Data provided by Institute for the Analysis of Global Security (United States) and RAND Corporation referring to the case of Iraq, have shown the increase of terrorist attacks against pipelines, oil facilities, and their personnel; 37 in 2003, 147 in 2004, 100 in 2005, 100 in 2006, 5 in January 2007; (RAND Corporation, 2007, Institute for the Analysis of Global Security, 2006). Therefore, due to aggravation and the success of terrorist acts (efficient terrorist tactics are transmitted and, the concerns over energy terrorism in gas sector are sensible and arguable (especially if considering that many of the gas pipelines are passing through regions with radical groups).

The most optimal strategy is not to deal with the issue after its emergence but to create the circumstances that will never let its appearance in the first place. As terrorism is a problem that cannot be easily faced and solved because of its multi-dimensional nature, gas companies have found themselves in the necessity to invest in infrastructure. However, technology advancement and the ongoing shifts in global arena have put companies in states and energy firms in a difficult position as the counter-measures have to constantly adopt to the developing threats and new global security realities. For example, in March 2012, Homeland Security had issued confidential alerts stating that a "major cyber-attack" was hitting computer networks at natural gas pipeline companies in the United States. In addition, in 2018 in Houston, a cyber-attack on a shared data network forced four of the nation’s natural-gas pipeline operators to temporarily shut down computer communications with their customers over the last week. Fortunately, no gas service was interrupted.

Therefore, it must be understood that the security of natural gas pipelines is a matter that should not be treated lightly. The complexity and diversity are factors, which contribute negatively to its resolution. Gas companies and states have invested in improvement of equipment and technology for new pipeline construction in order to on the one hand ensure their reliability and the decrease of accidents (attributed to

internal causes), and on the other hand to tackle the growing trend of energy terrorism. However, in the same time, the increase of measures securing energy supply will also influence the prices of energy products leading to increase in the cost of gas and oil.

In addition, the incidents of last decades have also led to a question: has energy security transcended from a national to international level? Do we need the adoption of new measures? One thing is sure that "as long as oil and natural gas are the foundation on which the world economy functions, the threat of such attack (terrorist) will obviously remain, and new achievements in the sphere of their prevention will inevitably increase the prices of a barerl of oil" (Serebryakov, 2006).

3.3.4. Liquefied Natural Gas.

"The liquefied natural gas (LNG) industry is one of the fastest growing sectors in the energy market. When referring to LNG, it is important to point out that it is not a new source of energy, but rather a method for delivering an already existing form of energy—natural gas. For decades, natural gas has been transported regionally via an extensive network of pipelines. While this has long been a reliable method for delivering the gas, it has reduced the marketability of the product, forcing suppliers and consumers to be tied together through the fixed infrastructure of pipelines and long-term contracts. LNG, on the other hand, is natural gas in a liquid state. It is produced when the natural gas is cooled at high pressure to minus 256ºF, which turns it into a liquid, reducing its volume to 1/600th that of its gaseous state. This makes it economically feasible and technically possible to transport in specially designed tankers rather than relying on a fixed pipeline infrastructure. Once a tanker reaches its destination, it offloads its cargo either in its liquid state into special facilities, where it is stored until it is regasified, or in its gaseous state after being regasified onboard the tanker before being fed directly into a domestic pipeline. LNG offers an alternative method to deliver much needed natural gas around the world, transforming the industry from a regional market into a global market" (Cindy Hurst, 2018).

Therefore, through this passage, it becomes apparent that LNG could prove to be crucial for the gas sector. Firstly, it tackles the disadvantages that the traditional ways of transportation of gas products are facing, which have been aforementioned before as the vulnerability of gas pipelines to internal and external factors, the need for huge investments in order utilize energy projects and the complication created by the lack of necessary technology.

Secondly, LNG eliminates the middleman, or those countries through which pipelines must traverse to reach its ultimate consumer thus reducing security threats (Cindy Hurst, 2018). Transit states are often characterized by political or economic instability that not only leads to the deterioration of present radical elements but also increased possibilities for disruptions in the energy supply.

Thirdly, LNG can have a positive impact on the energy security of the countries consumers. The LNG imports could function as a supplement to natural gas consumption, thus decreasing the dependency, increasing the flexibility through alternative delivery methods and creating bigger possibilities for diversification. Moreover, in the long run, countries importers could become less susceptible to political or economic pressure, coercion or blackmailing stemming from their energy providers, e.g. the relationship of European Union and Russia.

While LNG is clearly a positive development for the energy security of consumers and producers, it also is faced with some issues that could slow down the spread of its global use. “The largest consumers of LNG are predominantly those who belong to the Organization for Economic Cooperation and Development (OECD), countries considered democratized and by and large committed to free trade and open markets. On the other hand, the majority of LNG exporting countries are not democracies and they do not uphold the values and best practices OECD countries are accustomed to “(Cindy Hurst, 2018). This may be not a problem but the lack of trust and the increase margin of risk could hinder initiatives for business investments.

Furthermore, the lack of political stability in the countries exporters of LNG has also functioned as a deterring factor for the development of further dependency on LNG

products, e.g. Algeria, which is one of the main LNG exporters to European Union is currently being stigmatized by internal conflicts. A possible political transition or conflict could have devastating effects on the countries consumers' energy security. Therefore, the option of a cooperation with a politically stable government, despite the feasible scenarios of unhealthy dependency, seems more reasonable.

Another problem that LNG is facing is the threat of terrorism. "The potentially lethal nature of LNG was first realized in Cleveland, Ohio, in 1944 after a new cylindrical tank failed and released all of its contents into the nearby streets and sewers. The spill caused a vapor cloud to form and ultimately ignite, triggering a sequence of events that left, as mentioned before, nearly 130 people dead and destroyed 79 homes, two factories, 217 cars, and 7 trailers. The second incident occurred at the Skikda LNG plant in Algeria on January 19, 2004. This time, 27 people were killed and 72 wounded. The blast also destroyed three of the plant's liquefaction units and cut production levels in half. In both cases, these disasters were ruled accidents and not sabotage. "(Cindy Hurst, 2018). Despite these incidents, the LNG industry has proved to be capable of securing its transportation by achieving an impeccable safety record and investing greatly in advances security and safety measures. However, the fear of future terrorist attacks cannot be omitted leading to the creation of an unsettling feeling about the security of LNG.

LNG has positively contributed to global energy security and it is going to remain a a considerable force in the sector of energy, especially natural gas. It has created trade relations and political alliances that previously were not feasible due to geographical reasons. Countries that previously had no energy relations are now developing healthy energy interdependence, which is beneficial for all the sides.

Nonetheless, like all things, it has also its drawbacks. It could be a potential terrorist target and the countries exporting LNG are often susceptible to political transition or internal and external conflicts. However in some cases, LNG enables relations that are not conducive to global security, e.g. Iran and China therefore indicating that commercial interests are vital and security is just one aspect of the energy relationship.

Nevertheless, if treated correctly, LNG could function as a good supplement to natural gas consumption offering countries a bigger level of possible maneuvers concerning their energy security. Furthermore, the development of closer energy ties between countries importers and exporters could prospectively lead to further global stability, prosperity and security.

4. Conclusions

References