
ENERGY SECURITY OF THE VISEGRAD GROUP COUNTRIES
IN THE NATURAL GAS SECTOR

Marcin Jurgilewicz¹, Marek Delong², Stanisław Topolewski³, Bartłomiej Pączek⁴

^{1,2}Rzeszów University of Technology, Poland

³University of Natural Sciences and Humanities in Siedlce, Poland

⁴Polish Naval Academy of the Heroes of Westerplatte, Poland

E-mails: ¹m.jurgilewicz@prz.edu.pl; ²m.delong@prz.edu.pl; ³stanislaw_topolewski@wp.pl; ⁴b.paczek@amw.gdynia.pl

Received 10 March 2020; accepted 18 October 2020; published 30 December 2020

Abstract The energy security of the Visegrad Group countries is a derivative of their energy potential resulting from the lack of strategic natural gas and crude oil resources, limited fuel storage capacity and limited access to the transmission network. This causes a dependence on supplies of raw materials from Russia, which is not even, but applies to each of these countries. The Czech Republic and Slovakia have small deposits of natural gas and crude oil. Hungary and Poland have greater potential, but it is still not enough to achieve energy independence. The energy market of the V4 countries is of interest to the Russian Federation, but it is not a priority for it as it accounts for a small part of Russian transmissions. Russia aims to keep the market for crude oil and natural gas at a uniform level, but the actions of the V4 countries in terms of diversification of supplies, aimed at increasing the level of energy security, effectively hinder the implementation of this goal. The threat to the energy security of the V4 countries is related to their dependence on gas supplies from Gazprom. The terms of the contracts contain unfavorable clauses that negatively affect the sale of surplus Russian gas, as it is necessary to pay fees for the ordered gas regardless of the scale of its use. The differentiation in the energy policy of the Member States is also worth noting. An example is the lack of clear opposition from the Czech Republic, Hungary and Slovakia to the plans to expand the Nord Stream and Turkish Stream gas pipelines. These states show interest in participating in projects, which, in fact, constitute the implementation of the Russian concept of building new transmission routes. Poland takes a different position, consistently preventing the implementation of Russian energy projects.

Keywords: security, energy, law

Reference to this paper should be made as follows: Jurgilewicz, M., Delong, M., Topolewski, S., Pączek, B. 2020. Energy security of the Visegrad group countries in the natural gas sector. *Journal of Security and Sustainability Issues*, 10(2), 547-555.
[http://doi.org/10.9770/jssi.2020.10.2\(14\)](http://doi.org/10.9770/jssi.2020.10.2(14))

JEL Classifications: O1, O44

Additional disciplines: political sciences and administration, law

1. Introduction

Energy security has a dimension that definitely goes beyond national security, therefore it is impossible to adopt a single, generalized definition of it, e.g. due to the diversification of the interests of importing and exporting countries, as well as establishing its main components for different countries of the world. In this regard, the following are particularly important: protection of the environment against fossil energy sources, social consequences of energy security and counteracting threats (Simanaviciene et al., 2017; Genys, Krikštolaitis, 2020).

The concept of energy security covers four objective aspects: balancing the demand and supply sides, reliability including the reliability and sufficiency of the energy sector, introducing economic mechanisms for the operation of the energy market and minimizing the negative impact of the energy sector on the natural environment (Si-

manaviciene et al., 2016; Tvaronavičienė et al., 2018). The following can be distinguished among threats to energy security: physical, which include interruptions in energy supplies from one source or one region (Tvaronavičienė et al., 2020; Plėta et al., 2020); economic - dependent on energy prices; others with high environmental protection requirements that may affect production, consumption and supply (Soroka, 2015; Klimas, 2020).

Energy security is a necessary condition for the existence of any modern state. Energy is extremely important to the economy and has a large impact on other industries as their normal functioning depends on it (Czech, 2017, Semenenko, 2016). The level of the state's energy security and its sustainable development is determined by stable, sufficient, cost-effective and environmentally friendly supplies of energy resources for the economy (Simionescu et al., 2017; Shindina et al., 2018; Rabe et al., 2020). Therefore, its provision becomes a priority, and events in the global energy market are of significant importance for the global economy. Political threats resulting from the global international situation and the loss of state influence on the energy transmission and distribution infrastructure are put on a par with physical, economic and environmental threats. Such threats include the following: cyber-terrorist attacks threatening the energy infrastructure, the depletion of energy resources and the consumption of generating capacity of power plants, and the condition of mining and transmission infrastructure. Against this background, additional challenges may arise, resulting from the greenhouse effect or the global financial and economic crisis. The threats and challenges to energy security are also short-term and long-term. The short-term ones are related to the activity of the transmission transport infrastructure, e.g. shortages of supplies caused by accidents, political problems, terrorist attacks, weather conditions or network failures. On the other hand, long-term ones include depletion of resources, problems with mining and poor technical condition, differences between supply and demand, volatility of energy commodity prices, environmental pollution caused by activities in the energy sphere, acceleration of climate change, accidents (Lyons, 1994; Jurgilewicz, Protasowicki, 2015; Tvaronavičienė, Ślusarczyk, 2019).

The Visegrad Group is an informal regional form of cooperation between the states of four Central European countries - Poland, the Czech Republic, Slovakia and Hungary, which was established on February 15, 1991. It is a forum for exchanging experiences and working out common positions on issues of significant importance to Central Europe and the European Union. Among the priorities of cooperation, the most important is strengthening energy security in the region (Lyons, 1994).

This article deals with the energy security of the Visegrad Group countries in the natural gas sector. Research methods specific to the social sciences were used, including source analysis, system analysis, comparative method and quantitative method.

2. The energy security system of the European Union

The fuel and energy balance of the European Union is based on the availability of three main raw materials, which include: coal, natural gas and crude oil. Europe does not have significant raw materials on a global scale. The most powerful deposits of energy resources are located in the Middle East, Central and South America, North America, Russia and Africa. This makes EU countries strongly dependent on energy supplies from other parts of the globe. Along with the growing importance of world oil markets, the demand for natural gas also increased. The exploitation of these two raw materials in the EU has grown steadily since 1990. The basic energy resource in the EU is natural gas. The largest amounts of gas are produced from renewable energy sources, nuclear energy and solid fuels. The value of gas is constantly growing, which is related to the increase in consumption. Due to the growing demand for natural gas, security of supply is key to ensuring the energy security of many EU Member States, and of the Visegrad Group countries in particular (Kasperowicz & Štreimikienė, 2016; Kasperowicz, 2015; Chovancová & Tej, 2020). Natural gas production, as well as its share of global energy demand, has been increasing consistently for about forty years (Kułaga, 2018; Shakhovskaya et al., 2018; Al Mazrouei et al., 2020; Karaev et al., 2020).

The energy mixes of individual EU Member States differ significantly from each other (Jonek-Kowalska, 2019). These differences result, among others, from with: access to natural resources in a given country; the

geographic location of countries and the level of energy infrastructure; energy policy priorities. Due to their location, many countries are important transit points, such as Ukraine and Belarus. Due to numerous connections with neighboring countries, the extensive internal gas infrastructure causes that some countries create the so-called gas hubs, e.g. the Netherlands and Great Britain. Due to the negligible natural gas resources on the European continent, the EU is forced to import the raw material. However, it should be noted that some EU Member States are among the top 30 with the largest gas deposits: the Netherlands (761 bcm), Cyprus (141.6 bcm), Romania (105.5 bcm) (Heather, 2015).

Global producers of natural gas systematically export the raw material to EU countries. Among them are countries such as: USA, Russia, Iran, Qatar, Canada, China, Norway, Saudi Arabia and Algeria. Not all of the countries mentioned are the largest exporters. The gas produced is exported to the internal market, and additional supplies are earmarked for export (Skinner, Arnott, 2005).

Gas is transported to the EU market by pipelines or supplied in a liquefied form. Natural gas transported through gas pipelines goes to the European Union countries from the eastern, northern and southern directions. Russia is one of the largest gas exporters to the European market. The share of this country in exports to EU countries is as high as 40%. However, in the regional perspective it is much larger. The countries of the Central and Eastern Europe region, including the countries of the Visegrad Group, depend on Russian gas for approx. 90% of all supplies. Another country that leads the way in gas supplies to the EU is Norway, with a 35% share in total supplies. The largest importers of natural gas among the EU Member States are: Germany, Italy, Great Britain, France, the Netherlands, Spain, Belgium, Slovakia, Poland, the Czech Republic, Austria and Hungary. Apart from Spain, all countries obtain their gas from the East. Russia exports gas from the north, while Norway exports to Central European countries (Poland, Hungary, Slovakia). Natural gas is exported from the south to Italy (Algeria and Libya) and Spain (Algeria). Gas is also sent to Portugal via the Spanish transmission system. Gas imported by Member States is used in many sectors of the economy. High consumption and low production make many countries dependent on this raw material (Kułaga, 2018).

The European Union is 78% dependent on gas imports. Romania, Great Britain, Croatia and Poland are mentioned above the average for natural gas. In Denmark and the Netherlands, production is much greater than gas imports from other parts of the world. Romania needs only 2% of imported raw material to satisfy its domestic consumption. The dependence of Great Britain amounts to as much as 42%. However, the greatest dependence concerns Hungary and Austria - it accounts for about 90%. The infrastructure that is used to transport the raw material runs on the seabed and on land. Russia is the main gas exporter to the EU markets. The transmission system from the eastern direction also has the most developed part of the gas pipelines. These are also gas pipelines very important for ensuring Poland's gas security. Ukraine is a key transit country for gas supplies from the east to the EU. The largest natural gas transmission route in Europe is the Brotherhood transit system, which runs through the center of Ukraine. The system supplies gas to Slovakia, the Czech Republic, Germany and Austria. The international Yamal-Europe gas pipeline, which runs by land through the territories of four countries: Russia, Belarus, Poland and Germany, is very important in the energy policy of Europe. It is also of strategic importance for ensuring Poland's gas security. The gas pipeline has fourteen compression stations. In Poland, the pipeline is 683 km long, and its route includes 5 compressor stations in Kondratki, Zambrów, Włocławek, Ciechanów and Szamotuły. Energy dialogue between EU countries and Norway is definitely easier. Trade in raw materials takes place on the economic level and is not a tool of political pressure. Norway is also a key gas supplier for Northern European countries (Kułaga, 2018).

3. Energy potential of the Visegrad Group countries

The energy potential of the Visegrad Group countries results from the lack of strategic natural gas and crude oil resources. The weakness also results from the fuel storage capacity and access to the transmission network as well as from worsen payment ability (Kristofik et al., 2019). The Czech Republic and Slovakia have small deposits of natural gas and crude oil. Hungary and Poland have greater potential, but it is still not sufficient for "energy self-sufficiency". Poland has 145 billion m³ of raw material. However, taking into account the annual

consumption, it should be noted that this is not a sufficient amount to meet internal demand (Kłaczyński, 2017).

The abundance of natural gas and crude oil deposits and their availability in the Visegrad Group contributes to the enormous interest of energy companies in concessions for natural gas exploration and production. In 2017, only 39 companies had such concessions, which allowed them to explore and exploit deposits. Activities aimed at producing gas from unconventional sources are also very important for the energy sector. The extraction of shale gas, however, raises numerous controversies due to technical problems related to the exploitation of the raw material and the potential impact of production processes on the natural environment (Ciechanowska, 2016).

In Poland, the largest enterprise that produces natural gas is Polskie Górnictwo Naftowe i Gazownictwo (PGNiG). In 2015, the production of natural gas reached the level of 4.2 billion m³ of raw material. In 2016, the production was slightly higher - 4.7 billion m³ of raw material. It has been estimated that in 2019 production will reach 4.6 bcm (including 3.9 bcm in Poland and 0.7 bcm abroad). In 2020, PGNiG is to extract a total of 4.8 billion m³, including 3.9 billion m³ in Poland and 0.9 billion m³ abroad (0.5 billion m³ in Norway and 0.4 billion m³ in Pakistan). In 2021, the group's total production is expected to reach 5.2 billion m³, including 4.0 billion m³ in Poland and 1.2 billion m³ abroad (0.7 billion m³ in Norway and 0.5 billion m³ in Pakistan). Polish crude oil resources are also relatively small, which translates into their limited production. The opening of the Lubiatów-Międzychód-Grotów mine on July 29, 2013 resulted in an increase in crude oil production. The resources from the Lubiatów deposits are estimated at 7.2 million tonnes, and the extraction is done by PGNiG and the Lotos group. Lotos also exploits small deposits located at the bottom of the Baltic Sea in the Polish and Lithuanian zones (Ciechanowska, 2016).

Hungary is the second country of the Visegrad Group that has natural gas and crude oil resources. Already in the 1980s, natural gas imports to Hungary accounted for only 34%. The remaining demand for the state was provided by domestic natural gas mines. In the case of crude oil, Hungary is in a very favorable position. They have their own resources of this raw material, which until the 1980s satisfied the domestic demand. Currently, Hungary consumes nearly 15 billion m³ of natural gas annually. Own resources cover only 22% of the demand. Hungary is connected by a network of interconnectors with the European market, which increases the possibility of gas transmission from various sources (Łucki, Wiernek, 2005).

The Czech Republic also has small oil deposits. It is estimated that natural gas production capacity accounts for only 2% of total natural gas demand. There are small deposits of raw material in Moravia. The situation in the field of stocks, which concern oil production, is similar. Czech resources amount to 15 million tons. The Czech Republic, on the other hand, has the natural gas market that is the most diversified among the Visegrad Group countries, which gives them the opportunity to transmit gas from several different sources. Therefore, they obtain gas on the basis of contracts concluded with Norway and Russia. Slovakia is the weakest in terms of natural gas and crude oil resources compared to the Visegrad Group countries. It is estimated that the total reserves of natural gas constitute 14 billion m³ of raw material, and crude oil - 9 million tonnes. The country's energy security is ensured by only three natural gas storage facilities with a capacity of nearly 2 billion m³ of raw material, which constitutes only 74% of the total state demand. Slovakia, however, strengthened its position in negotiations with the Russian side, obtaining at the same time the possibility of supplying crude oil and natural gas from sources other than Russian. Nevertheless, the vast majority of it uses raw materials of Russian origin (Paniuszkin, Zygar, 2010).

4. Energy security systems of the Visegrad Group countries

Security in the energy market depends on solidarity between the member states. In recent years, Europe's energy security has been a priority for the EU, which has been particularly evidenced by the Ukraine-Russia conflicts. The starting point for the cooperation of the Visegrad Group countries in this regard is undoubtedly the dependence on gas supplies from Russia. The level of this addiction is uneven, but it affects all of them. The V4 countries are almost entirely dependent on supplies from Russia. In 2018, 88% of gas imported by V4 came from the Russian Federation (Kułaga, 2018).

Gas is the most important imported energy resource in the V4 countries, so energy security and energy policy are of great importance to all Group Member States. Despite the diversity of energy consumption and the importance of natural gas for their economies, they all face common challenges in terms of energy security (Zapletalová, Komínková, 2020).

The energy systems of the Visegrad Group countries are also linked to non-EU countries located in South-eastern Europe. It should be noted, however, that both the existing gas pipelines (Yamal, Brotherhood, Nord Stream) as well as the planned ones (the South Stream project has not been implemented) make Central Europe and the Balkans dependent on Russian supplies. The largest gas transmission pipeline from Russia to Germany runs through Slovakia and the Czech Republic. Together with the Yamal pipeline running through Poland, the V4 countries transport at least 100 billion m³ of Russian gas. Gas trade on the North-South axis or from the West to the East makes operators in Slovakia and the Czech Republic highly sensitive to the expectations of Russians. In the Czech Republic, security of gas supplies is also seen in the good integration of the Czech and German transmission systems. The Opal gas pipeline, running from the coast of the Baltic Sea to the Czech Republic, as an overhead branch of the Nord Stream, is considered to strengthen energy security and a source of Russian gas supplies in the event of a possible cut off of transmission via Ukraine. The Czech Republic treats Russian gas from the Opal and Gazelle pipelines as strengthening its own energy security (Turkowski, 2014).

It is still necessary to modernize the material infrastructure between and around the Visegrad Group countries in order to complete the construction of the North-South Corridor. In recent years, European companies have renegotiated the terms of long-term contracts more often. The predominance of long-term contracts led to a reduction in the number of sources of supply outside Russia. Most of the Czech, Slovak and Polish contracts with Gazprom will expire in 2022-2035. The situation in Ukraine is of significant importance for the energy security of the Visegrad Group countries - due to geographic proximity and close economic and cultural relations. There is no doubt that ensuring energy security requires the following actions from the V4 states: development of cross-border interconnections; use of the capacity of the Polish and Lithuanian LNG terminals; developing underground gas storage facilities; gas market liberalization; developing spot markets; concluding contracts with alternative gas suppliers (Kułaga, 2018).

5. The energy policy of the Russian Federation towards the countries of the Visegrad Group

Russia is striving to become a monopoly on the energy market. As part of the adopted strategy, it implements projects of new transmission networks. The countries of the Visegrad Group, on the other hand, strive to ensure energy security based on the diversification of the sources of energy raw materials, but also the diversification of their transmission routes (Irušek, 2020).

The transit countries have a weak position on the fuel market of Central and Eastern European countries. At the same time, gas flows from Russia to the V4 countries still account for a small percentage of Russian shipments. This generates challenges and threats to the energy security of the V4 countries (Kovács, K. Szczerski, P. Binhack et al., 2011; Klietík et al., 2020).

Everything indicates that Russia will keep a significant part of the natural gas and crude oil market of the Visegrad Group. Its energy strategy is in this case the starting point of the energy policy it implements towards most Central and Eastern European countries. As a result, it aims to maintain the sales market for crude oil and natural gas at a uniform level, but the V4 countries' policy aimed at diversifying natural gas supplies makes achieving this goal more and more difficult for Russia. The situation on the market of gas supplies to Poland, related to the opening of the LNG terminal in Świnoujście, has led to a significant diversification of the current supplies from Russia. If the expansion of the LNG installation is continued, gas flows directly through a network of interconnectors to other countries of the Visegrad Group. A completely new gas network is being created, consisting of smaller local connections, which will be based on sources of supply in gas mains and LNG terminals with a total capacity of over 30 billion m³ of gas per year. This is exactly as much as the demand for natural gas of the Visegrad Group countries (Trubalska, 2019).

A very important role in Russia's energy policy towards the V4 countries is also the change of priorities regarding the American policy regarding the possibility of exporting gas obtained from oil shale. In 2014, the US Congress considered the possibilities of transporting American "blue fuel" to European countries, which was supposed to reduce dependence on the Russian supplier. It was assumed that shale gas would appear on the European market thanks to the LNG terminals located on the North Sea and the Baltic Sea. In this way, it would go to all the countries of the Visegrad Group. Currently, the V4 states are dissatisfied with the terms of the gas contracts concluded with Russia's Gazprom. Dependence on Russian supplies is burdensome and the proposed conditions are clearly unfavorable. They contain numerous clauses according to which the recipient must pay for the ordered raw material, regardless of the scale of its use. They are also striving for the signing of the Energy Charter Treaty by the Russian side. However, the chances of an agreement of this type in this case are very small. The energy policy of the Russian Federation is implemented in contradiction to the assumptions of the energy strategies of most European countries (Dyduch, Skorek, 2020; Kłaczyński, 2010).

Many investments in the construction of gas transmission lines in Central and Eastern Europe have not been completed. An example is the project of the "Nabucco" line, which was to become part of the southern corridor for transporting natural gas from the Caspian Sea region, and thus an alternative to Russian gas. In June 2013, the Trans-Adriatic Pipeline (TAP) was chosen instead of the "Nabucco" to bring Caspian gas to the European border. The situation regarding the project to build an LNG terminal on the Croatian Adriatic is similar. However, Croatia invests in its own deposits and obtains cheaper raw material from Russian sources. The lack of a decisive international reaction to the Russian projects to build transmission installations "South Stream" and "Turkish Stream" caused Russia's involvement in the development of transmission infrastructure in Southern Europe. Hungary's activity in this respect is noteworthy, as it is striving to build new and modernize the existing infrastructure to become a gas hub. At the same time, they implement a policy that often differs from the position of the V4. The Russian side concluded many agreements with Hungary, which concerned the nuclear energy market, natural gas transmission and storage, and crude oil sale conditions (Kaczmarek, 2010).

The position of the EU, which does not take specific measures to diversify natural gas supplies, is also ambiguous. An example of this is the lack of involvement in the legal dispute, which is a consequence of Gazprom's use of practices that are inconsistent with EU law in the field of natural gas transmission and trading in Central Europe. Some of the Visegrad Group countries are trying to use the reverse function for the current system of gas connections. In the event of a suspension of supplies from Russia, the V4 countries thus have the option of obtaining raw material from other sources (eg. Norwegian). Everything indicates that the Russian Federation will remain the main supplier on the fuel market of the V4 countries, despite the fact that its share and importance in the energy policy of Poland, the Czech Republic, Slovakia and Hungary has changed. One of the most important goals of the Russian energy policy is taking over the assets of the national energy sectors in these countries. The Russian Federation aims to diversify the natural gas transmission route, the best example of which is the construction of the "Nord Stream2" installation. Nevertheless, it continues to try to dominate the energy markets of the V4 countries.

6. Summary

It is the responsibility of the public authorities to guarantee safe and stable supplies of natural gas for the economy. This is because it concerns the protection of end users, including households, as well as basic social services. The energy security of the Visegrad Group depends on the diversification of supply sources, suppliers and transit routes with the help of new gas infrastructure. Currently, the V4 countries differ in the application of national security of supply measures and market integration. The Czech Republic and Poland are much more diversified than Slovakia and Hungary due to adequate access to the Western gas hub and the LNG terminal. Hungary and Slovakia remain heavily dependent on a single gas supplier (Russia) in their energy mix due to the terms of long-term contracts and the weak infrastructure to diversify sources. The energy market of the Visegrad Group countries is of interest to the Russian Federation. However, it is not a priority for the implementation of Russia's energy strategy. It is largely dominated by the Russia-Germany and Russia-European Union relations that shape the current crude oil and natural gas market. They also influence the final shape of the energy

policy of these countries. This fact results, among others, from the decisions of the Czech authorities to join the construction of the auxiliary infrastructure of the OPAL gas pipeline, as they enable the Russian transmission bypassing unstable Ukraine.

However, it should be noted that the Czech Republic, Hungary and Slovakia have not objected to Russian plans to expand the Nord Stream and Turkish Stream gas pipelines. These countries show interest in participating in projects derived from Russia's plans to build new transmission routes. Against this background, the energy policy of the Polish government looks different, as it consistently tries to counteract the implementation of Russian energy projects. These activities result in the decision to build an LNG terminal in Świnoujście, attempts to diversify crude oil supplies to Polish refineries, contacts for LNG supplies from the USA and efforts to block the Nord Stream II investment.

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Marcin JURGILEWICZ is the Professor at Rzeszów University of Technology, PL. Research interests: internal security, law, mediation.

ORCID ID: 0000-0003-2243-2165

Marek DELONG is the Professor at Rzeszów University of Technology, PL. Research interests: international security, policy, international relations.

ORCID ID: 0000-0001-7766-5834

Stanisław TOPOLEWSKI is the Professor at University of Natural Sciences and Humanities in Siedlce, PL. Research interests: national security, internal security, information security.

ORCID ID: 0000-0001-8268-3754

Bartłomiej PĄCZEK is the Professor at Polish Naval Academy of the Heroes of Westerplatte, Gdynia, PL. Research interests: national security, internal security, maritime safety.

ORCID ID: 0000-0002-6599-6684