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POLAND'S ENERGY BALANCE AND ITS FUTURE. THE CASE STUDY OF GAS AS AN ENERGY SOURCE

ABSTRACT
The aim of the article is to present the case study of the Poland's energy balance with regards to the natural gas. The article states that natural gas will play an increasing role in the balance with Poland's attempts at diversifying its deliveries.
The authors reviewed a lot of sources, mainly Polish, and synthesized them so that the article's theses could be developed and defended. Among the sources reviewed were governmental official documents issued by Poland's, Russia's and European Union's authorities, academic texts and highly specialized press articles.
Natural gas will inevitably increase its position within Poland's energy balance in the next decades. Poland's authorities are planning to diversify gas deliveries in order to lessen its dependency on Russian gas. It is a difficult task and needs developments in many fields (constructing new pipelines, among others). If Poland's shale gas resources prove as high as predicted, the country might become an exporter of the fuel, which will radically alter Poland's position in the world.

KEYWORDS: energy policy, natural gas, sources of energy, Poland, Russia, European Union

Energy balance constitutes a vital part of countries' energy safety policy and strategy. This factor, if well-developed, may serve as one of the sources of the countries' high stand on the international arena, may become the basis for people's well-being and fast development of economies. As for Poland, the topic has been at the centre of debate since 1989 – the year when Eastern Europe had freed itself from the Soviet influence. At that time Poland was no longer politically dependent on Soviet Union, yet economic ties remained strong, especially in the field of fossil fuels trade. This is mirrored in today's Poland's energy balance, which will be discussed shortly in the following part of the article.

For decades, the main fossil fuel as regards Poland's energy balance has been coal. Also in the first decade of the 21st Century coal was still by far the main source of energy in Poland. As for 1997, the shares of energy carriers in gross inland consumption structure was as following: coal 72% (black coal 59%, brown coal – 13%), crude oil 15%, natural gas 9%, renewable energy sources 3%[1]. In 2004, coal constituted 62% of the country's energy consumption (black coal – 48%, brown coal – 14%), with 20% for crude oil, 13% for natural gas, 5% for renewables. In 2008, the balance looked quite similar – 60% for coal, 20% for crude oil, 12% for natural gas and 8% for renewables[2].

Since coal is still the main energy source for Poland by such a wide margin, successive governments have been trying to make the use of it more and more effi-

[1] S. Kowalik, J. Herczakowska, M. Gajdowska, *Analiza polskiego rynku paliw na tle Unii Europejskiej*, „Polityka Energetyczna" 2009, z. 2/2, p. 296-300.

[2] *Polska strategia energetyczna*, www.geoland.pl/dodatki/energia_lix/mg.html [date of access: 2011.08.09]; *Bezpieczeństwo energetyczne Polski*, www.rurociagi.com/spis_art/2006_5/pdf/bezpieczenstwo.pdf [date of access: 2011.08.09].

cient and environment-friendly. The current government (with Donald Tusk as the prime minister) issued a document entitled "*Poland's energy policy until 2030*" on the matter. As the document states, Poland's energy balance's main part will still be black and brown coal. Apart from these, Polish government plans to support investments in areas of gas, nuclear and renewable energy.

Despite the fact that natural gas, as shown above, plays a minor role within Poland's energy balance, this fossil fuel has grown to be probably the most important politically-wise. It is so for a number of reasons:

– because of Poland's post-1945 reliance on Soviet and Russian natural gas, which, after Eastern Europe freed itself from the Moscow's dominance, became a burden that proved to be highly difficult to get rid of;
– before the Nord Stream become reality, Poland was an important transit state for Russian gas imported by Western European countries, which, with the addition of the fact that Russian Federation has been playing its fossil fuels resources like a political game in recent years, put Poland in quite an uncomfortable position towards its EU allies in case of any supply problems;
– Poland is able to satisfy only 35% of its natural gas demand from its own sources, thus Russia, where Poland imports the majority of this energy source from, may easily use it to put political and economic pressure[3].

Another reason, directly connected to the one mentioned in point a, is that Poland's dependency on Soviet and Russian natural gas has created a specific infrastructure, with pipelines running from the East to the West. It has limited Poland's capabilities of quick diversification of natural gas supplies in the last 20 years. Today Poland is constructing natural gas pipelines that run from the South to the North and other ways round as a step towards becoming safer energy-wise.

As for June 2011, the length of natural gas pipelines in Poland was 9768 km, there were also 854 gas stations, 14 gas compressor stations, and 57 gas junctions. This network enabled to transport more than 15 b m^3 of the fuel a year. It is impossible, for example, to import gas through pipelines from other directions than Ukraine and Belarus, which only adds to Poland's dependency on importing the fuel from the countries east of Poland. Polish investor, Gaz-System, is planning to construct new pipelines inside of the country, as well as connect Poland's gas network to more pipelines from the south and north of Europe. Up to 2014, the company wants to construct 1000 km of new gas pipelines in the north-west, central and south-west of Poland. These investments will improve energy safety of the above-mentioned areas of Poland and enable gasification of some new regions of the country. As regards international natural gas infrastructure, Gaz-System understands the importance of connecting Poland's pipeline network with the systems of neighbouring countries. Among the crucial investments here is rebuilding the connector in Lasowo (Poland-Germany border) and improving its transmission from the current 0,9 bln m^3 up to 1,5 bln m^3. Not any less important is the connector between Polish and Czech gas pipeline systems. This short (32 km) pipe will allow both countries to pursue the idea of building a connection between the north and the south of Europe. The plan to create so-called North-South Corridor between LNG terminals in Świnoujście and Adria in Croatia will allow for the gas to be transported from the top to the bottom of Europe, and will make it easier to invest in the internal gas pipeline networks among countries through which the pipeline will run.

As has been mentioned, natural gas placed itself around 12-13% within the Poland's energy balance in the second part of the first decade of the 2010s. As one of the government's documents (*Polityka energetyczna Polski do 2025 roku*) states, the demand for this fuel is and will be growing steadily – 2015 – 21,2 bln m^3, 2020 – 23,6 bln m^3, 2025 – 26,4 bln m^3. It does not automatically mean that its participation in the energy balance will grow at the same rate, because Poland is planning to produce more electricity and heat originating from renewable sources, moreover, the country is working on introducing nuclear energy into the balance. As regards Poland's own production of energy sources, gas, as for 2004, occupies 2nd place with 5%. As to Poland's import of energy sources, gas is listed at 28%, with crude oil at 72%. In 2005, Poland imported natural gas from the following countries: Russia (4,65 bln m^3), Kazakhstan (0,98 bln m^3), Uzbekistan (0,61 bln m^3), Norway (0,35 bln m^3), Turkmenistan (0,32 bln m^3) and Germany (0,19 bln m^3)[4].

RUSSIA'S AND EU'S ENERGY POLICIES

Poland's dependency on Soviet Union in the not-so-distant past created the situation, where currently Poland

[3] A. Chmielewski, *Bezpieczeństwo energetyczne państwa. Geopolityczne uwarunkowania*, Warszawa 2009, p. 45; M. Lasoń, *Polska wobec wyzwań bezpieczeństwa energetycznego*, [in:] *Międzynarodowe bezpieczeństwo energetyczne w XXI wieku*, ed. E. Cziomer, Kraków 2008, p. 239.

[4] M. Lasoń, *op. cit*., p. 239-244.

still relies on Russian supplies, especially in the case of natural gas. Of course, the same pertains to west European countries, but their dependency on Russian gas and oil is less political, more economic and commercial, whereas Poland's one bears the burden of few dozens years of general dependency on Moscow which was disliked by common Poles, that is why its current energy dependency on Russia is now unwelcome on more levels that in the rest of Europe.

RUSSIA AS A NATURAL GAS GIANT

Russia's energy policy constitutes an integral part of its international relations, moreover, the economic potential of Russian Federation is primarily based on its natural resources, natural gas especially, and their prices in the world markets[5].

Russia possesses the biggest confirmed reserves of natural gas in the world – 47,8 trillion m^3, which is 1/3 of all the reserves on our planet. Natural gas production is 1/4 of the world's production, with over 600 bln m^3 a year (2006 – 656 bln m^3, 2007 – 650,7 bln m^3). In 2005, the country exported over 206 bln m^3, within which over 47 bln m^3 were sold to former Soviet Union countries and almost 160 trillion m^3 to the rest of buyers (mainly central and western Europe), in 2006 the export was bigger – 202 bln (former Soviet Union – 1/3, Europe – 2/3). The main pipelines for exported Russian gas are the ones running via Ukraine, which is of high political importance[6].

In 2003 Russian government issued a document entitled "*Russia's energy strategy until 2020*." The document states, among others, that energy sources constitute the basics of economic development and important tools in internal and foreign politics of Russian Federation. As to natural gas, it states, in an optimistic variant, that in 2020 Russia will increase gas production up to 680-720 bln m^3. Central and western Europe will remain the most important markets for Russian gas, as the westward export will rise by 23% up to 2020. However, this document, after a few years of being in force, proved to be out-of-date, especially in the field of natural gas and oil production projection. In its place Moscow created another document "*Russia's energy strategy until 2030*". Here, the projections are adjusted, but the main goal remains the same. This is to be achieved by gaining sole access to pipelines and transit routes and prevent former Soviet Union countries from gaining energy independence and disallowing them to construct new pipelines that would go around Russian Federation[7]. This is just an example of how Russia is harnessing its richness in oil and especially natural gas. Russian Federation has enough potential to become an energy empire, and this way influence the world[8].

One of the Russia's projects in which Poland's energy interests are at stake is the Nord Stream. This pipeline (technically started in September of 2011, and made operational in November 2011) runs from Vyborg in Russia through the Baltic Sea to the town of Lubmin in Germany. After the natural gas reaches Lubmin, it will be transported through Germany by two pipes – OPAL, which will run along Poland-Germany border to the Czech Republic, and later, pipe NEL will transport the gas to Holland and Great Britain. The main goal of the Nordstream project is to directly connect Russian natural gas pipeline system with the European one going around Poland and other traditional transit countries, especially Ukraine and Belarus. Russia's determination to achieve this goal can be seen in its decision to abandon Jamal II project. Jamal pipeline was a major project for the EU countries (Poland among them), running since the mid-90s, allowing to supply as much as 65 bln m^3 of gas if two Jamal pipelines were built. However, after opening the first Jamal pipe Russia decided to abandon the second leg of the project in favour of Nord Stream, which better suits current Russia's energy policy. Thus one may come to the conclusion that Moscow is pursuing a aggressive energy policy, trying to co-operate with individual European countries rather than EU as a group of countries[9].

EUROPE'S ENERGY STRATEGY IN THE FIELD OF GAS

European Communities had not regarded energy safety as one of its main international policies until the energy crisis of the 70s, when suddenly oil and gas prices went up and the reserves were belittled substantially. Then the countries importing energy sources realized that those who sold them were starting to treat this commerce as a tool to press the recipients politically. It was back then when energy safety became one of the key elements in general international relations.

[5] B. Molo, *Polityka bezpieczeństwa energetycznego Federacji Rosyjskiej*, [in:] *Międzynarodowe bezpieczeństwo energetyczne...*, *op. cit*., p. 73.

[6] *Ibidem*, p. 79-80.

[7] *Ibidem*, p. 88-91.

[8] R. Kłaczyński, *Ropa naftowa i gaz ziemny obszaru postradzieckiego. Rola i znaczenie surowców energetycznych w polityce Kremla*, Kraków 2010, p. 18.

[9] J. Osoba, *Rosyjsko-niemieckie konsorcjum Nord Stream a dywersyfikacja*, [in:] *Rosja. Ambicje i możliwości w XXI w*., ed. K.A. Kłosiński, Lublin 2010, p. 197-199; M. Lasoń, *op. cit*., p. 258; *Jamał przegrywa z Nord Streamem*, www.money.pl/gospodarka/wiadomosci/artykul/jamal;ii;przegrywa;z;nord;stream,240,0,281584.html, [date of access: 2011.11.02].

The first step was to establish the *Green Book* (2006), which constituted European strategy for sustainable, competitive and safe energy. There were 6 main points in this document, among them finishing off with creating internal oil and natural gas markets in member countries, safety and competitiveness of energy supplies, innovations within energy technologies and common external energy policy. In 2007 EU continued to work on creating basis for common action within the field of energy sources. The conclusions were quite negative – first, it was stated that current energy policy did not guarantee reducing CO_2 emission, it would rather rise by 5% until 2030, moreover, with this policy EU's dependency on importing energy would rise from 50% to 65% within this time frame. As to oil and natural gas, the dependency would be substantially higher – the former up to 93%, the latter – 84%. The European Commission further stated that it was not known as for back then how to satisfy the growing demand, which brought political and economic risk. The most important conclusion, however, was the one stating that with current state of affairs EU did not have any mechanisms of assuring solidarity among member states in the wake of any incoming energy crisis. Basing on these assumptions, European Commission put forward few areas, in which its energy policy would develop:

– creating the internal energy market, which would boost competition, investments; constructing new pipelines and gas hubs in the Baltic and Central European states; developing mechanism of energy solidarity among member countries;
– better effectiveness of energy consumption; reduction of the basic energy consumption by 20% until 2020, which would save about 100 mln euros a year and reduction in CO_2 emission by 780 mln tons a year;
– the Commission proposed that the level of renewable energy sources in general energy balance of EU would be 20% in 2020;
– the Commission stated that it was inevitable for EU to continue co-operating with non-member states in the field of energy commerce and safety. Thus EU should work out the common energy policy, which would assure geopolitical safety for the whole organization[10].

However, the main goal for EU'S policy in the field of natural gas import, is to arrange its relations with Russian Federation in such a way so that natural gas supplies from this country would be highly stable. It has proven to be very difficult, among others due to Germany's policy towards Russia in the field. Germany, being the most innovative country as regards energy producing and consuming, and a significant energy importer, plays a major part here. The country exports a lot of gas from Russia, however at the same time it is looking for alternative sources of energy supplies in Norway, Africa, Central Asia and Middle East. Currently, however, the construction of the Nord Stream, where German energy companies play major role, and Berlin strongly backs this project, created the situation, in which energy safety of some European countries, Poland among them, has been reduced. Germany is interested in direct access to Russian energy resources and development of transporting network. On the other side Moscow is interested in German investments in the field, its innovations and direct access to natural gas buyers on European markets. It seems that Germany-Russia energy relations do not go with UE-Russia ones. However, one may hope that this fact will bring about, stronger than previously, the subject of European solidarity in the field of energy commerce and safety. It is one of the major aims for EU to develop partnership with Russia in the natural gas sector, however its conditions must allow Europe to look for and use different sources and producers[11].

In 2010 the European Parliament and the Council of the European Union Commission passed the 994/2010 resolution. This law is supposed to strengthen the energy safety of EU member states, with particular regard to the Easter European countries, for they suffer the most once an energy crisis occurs. The resolution names three levels of crisis: 1. early warning level (reliable information that deterioration of gas supply might occur); 2. alert level (significant deterioration of gas supply occurs); and 3. emergency level (the above-mentioned situation occurs plus exceptionally high gas demand with the market no longer able to rectify it by itself). What is very good for the Eastern European EU members, according to the document, is the fact it is compulsory for the European Commission, to announce the emergency level when as few as two countries file a motion to announce one. This gives confidence to countries like Poland, Slovakia, Lithuania, Latvia and the Czech Republic among others, as they are first in line to be troubled by any deterioration of Russian gas supply. The resolution also orders to modernize the existing natural gas infrastructure, by, for example, enabling to transport gas in both directions within Russian pipelines "Brotherhood" and "Friendship," which, as for now, do

[10] M. Tatarzyński, *Polityka energetyczna Unii Europejskiej*, „Bezpieczeństwo Narodowe" 2011, nr 3-4, p. 108-115.

[11] J. Osoba, *op. cit*.

not provide the recipients with such a possibility. The resolution also sees the necessity of constructing pipelines connecting Poland with the Baltic states, because these countries are, as of now, connected to Russian pipeline system only. One of the attachments to the resolution states the means of non-market actions that night be taken when an energy crisis occurs and is at the emergency level. It states that a country which has found itself in such a situation may use its strategic gas reserves, increase its own production of the fuel or introduce mechanism that reduce the demand for it[12].

POLAND'S ENERGY POLICY IN THE FIELD OF NATURAL GAS

Natural gas, as has been stated at the beginning of this article, is not the most important energy source in Poland's energy balance. Coal, however, does not satisfy Poland's energy needs in total, that is why the country is in constant need to buy gas and oil from foreign traders. Since Poland's oil supplies are regarded to be quite safe, it is natural gas that wins the attention of Polish policy makers.

Natural gas comprised as little as 11,6% of the final energy within Poland's energy balance in 2007. It is, among others, caused by the strong pro-coal lobby uninterested in decreasing the importance of coal in the energy balance, and the lack of actions towards protecting the environment from being polluted by coal and steel production industries[13]. As regards the definition of energy safety, of which diversification is an integral part, the Energy Law Act of Poland's parliament stated in 1997 that it is the state of economy enabling covering the current and future needs within the field of fuels and energy in the way that is economically justifiable, with environmental protection granted. As far as natural gas is concerned, two elements are important here: geographical one (ensuring natural gas supplies from different geographical directions) and infrastructural one (both creating transporting infrastructure enabling to transport gas from these directions and producing energy from different sources like nuclear plants or renewables)[14].

DIVERSIFICATION OF SUPPLIES

The diversification of energy sources supplies has become one of the main markers of Poland's energy policy. It is crucial for the policy makers to ensure, above all, continuity of supplies, which will allow Poland to carry out a fluent alteration of supplies direction in case of any interruption in deliveries. The main document issued by Poland's authorities on its energy policies, *Polityka energetyczna Polski do 2030 roku*, stated firmly, that Poland's energy policy would ensure the diversification of directions of energy supplies, suppliers, routes and types of transport. It saw the need to overcome the significant dependence on one supplier. It is crucial, the document stated, to take action aimed at winning new sources of supply and types of transport, increasing Poland's own production and abilities to store natural gas. Former Poland's government's regulation of 2000 states that the relation of natural gas imported from one direction to the whole amount of the imported fuel must not exeed 70% between 2010-2014. That's why the government and its controlled enterprise PGNiG started diversifying the suppliers by buying more gas from Germany (8% in 2009) and Asian countries (5%)[15].

Before discussing the ways to diversify Poland's natural gas supplies, it is advisable to state where the faults within the whole energy policy in Poland are. The biggest one seems to be the fact which has already been mentioned above – majority of imported gas is bought from Russia. This brings about another foreseeable problem – Poland might become affected as soon as Russia interrupts its deliveries to, for example, Ukraine and Belarus, with which Kremlin has had energy conflicts over the last decades. And finally, Poland's energy balance is still dominated by coal, which means that the environment is polluted significantly and that increasing the amount of natural gas within the balance, as well as the percentage of renewable sources of energy are among the ways to cope with this problem[16].

There are many possibilities for Poland's authorities to rectify the above-mentioned faults within Poland's natural gas field. Let us first discuss the ways of diversifying the suppliers geographically.

NORWEGIAN GAS

Poland has had a long history of trying to buy natural gas from gas-rich Norway in the last 15 years. At the

[12] P. Turowski, *Nowe prawo Unii Europejskiej, a bezpieczeństwo gazowe Polski*, „Bezpieczeństwo Narodowe" 2011, nr 17, p. 81-97.

[13] A. Toś, *Polityka Polski w zakresie dywersyfikacji dostaw gazu ziemnego – ocena rozwiązań alternatywnych*, www.stosunkimiedzynarodowe.info/artykul,762,Polityka_Polski_w_zakresie_dywersyfikacji_dostaw_gazu_ziemnego_?_ocena_rozwiazan_alternatywnych [date of access: 2011.10.31].

[14] *Ibidem*.

[15] M. Lasoń, *op. cit*, p. 248-249. See also: R. Wójtowicz, Z. Gebhardt, A. Strugała, *Możliwości dywersyfikacji dostaw gazu ziemnego do Polski w świetle obowiązujących w kraju wymagań jakościowych*, „Polityka Energetyczna" 2011, t. 14, No. 1, p. 298.

[16] A. Toś, *op. cit*.

very end of his term as prime minister, Jerzy Buzek even signed a contract to do so, but it was not ratified by the parliament and rejected by the next government under prime minister Leszek Miller. The government returned to the idea in 2005, but then again economical reasons prevailed and it was rejected, too. Some time later a better idea came up – to connect Poland to Danish and Norwegian pipeline systems and, effectively, with the natural gas resources in the North Sea. Poland's PGNiG and Gaz System signed the contract to build the interconnecting pipeline (230 km) with the Denmark's Energinet.dk, and since 2008 the plan has been co-financed by the European Union. As for now it is believed that the pipeline will serve not only as a way of transporting Norwegian gas to Poland, but also to transport Russian gas to Denmark, which would ensure a well-functioning market on both sides[17]. It is important here to note that, in general, European Union has been backing this project since its inception, understanding the need to build the new northern gas infrastructure in Europe. However it has had its ups and downs, having been cancelled and revived few times already, nevertheless, if realized, it is a real chance to diversify Poland's gas import's directions.

NABUCCO PIPELINE

This project ensures gas supplies from the Caspian Sea region and Iran and is highly advantageous for Poland. However, Poland's authorities would have to invest into constructing the connector from Austria to the Czech Republic and Poland's border. The company behind the project – Nabucco Gas Pipeline International – is planning to build a 3000km-long pipeline with the transporting abilities of 30 b m^3 of the fuel a year, going around Russia. If realized, Nabucco will open a new transport route to Europe from the Caspian Sea area and increase energy safety for the countries participating in the project[18]. In case of Poland, this pipeline, which may be operational as soon as 2014, and fully finalized around 2019, will increase the number of directions from which the country would import natural gas and make a way for decreasing the amount of fuel imported from Russia after 2022. One important aspect is of financial nature – the cost of participating in the project is quite low for Poland – 1 b euros- in relation to the possibility of winning access to non-Russian natural gas source. However, there are some negatives, too. This pipeline will be very long, running from the Asian Middle East countries, of which quite a few might be regarded as politically unstable. Moreover, the length of the pipeline means it will transit many countries in Asia and Europe, which increases the final price of the fuel. And, although Poland's participation in the project seems very advantageous, its authorities have not decided yet if they would join in[19].

It is worth noticing that in 2012 it turned out that Nabucco would probably not come to existence in the form previously planned, but, as EU Energy Commissioner Guenther Oettinger has lately stated, Caspian gas will be transported to Europe via any other pipeline that Azeri authorities choose in the immediate future[20].

BERNAU-SZCZECIN PIPELINE

This is a project of interconnecting Poland's and Germany's pipeline systems. The volume of fuel transported through this pipeline was to be 2 b m^3, and the cost was to be 320 milion zlotys. It was planned that the pipeline would start in 2006, but the Polish side opposed it for the anticipated high cost of the fuel (because of the transit through Germany). Andrzej Lipko, one of Poland's experts in the field of energy safety, stated that the project had never been a diversifying one, its aim was only to connect two pipeline systems. However, another expert, Roman Ney, said the project was a good one, because Poland did not have, at that time, any significant interconnections with western and southern neighbours. He also stated that such interconnector would serve as a safety-providing pipeline in case of any interruptions of eastern supplies[21]. This pipeline is highly interesting because of different reasons, too. Poland's authorities had for years rejected the idea of the Bernau-Szczecin pipeline, however PGNiG put forward its own project to construct the Boernicke-Police pipeline. The company has already started carrying out market research to establish if the project will be economically effective. At the same time, PGNiG has been trying to buy the Bernau-Szczecin project from Bartimpeks, so at present it is not certain which project will prevail[22].

[17] *Denmark and Poland considering gas pipeline*, www.energy-business-review.com/News/denmark_and_poland_considering_gas_pipeline [date of access: 2011.10.31]; *Gazociąg Baltic Pipe uzyskał dofinansowanie UE*, www.podatki.biz/artykuly/16_10766.htm [date of access: 2011.10.31].

[18] M. Lasoń, *op. cit*., p. 259-260.

[19] A. Toś, *op. cit*.

[20] *Maciążek: Na trupie Nabucco. Czyli przyszłość południowego korytarza gazowego*, http://politykawschodnia.pl/index.php/2012/10/13/maciazek-na-trupie-nabucco-czyli-przyszlosc-poludniowego-korytarza-gazowego/ [date of access: 2012.11.13].

[21] *Siedem sposobów na dywersyfikację dostaw gazu*, www.wnp.pl/artykuly/siedem-sposobow-na-dywersyfikacje-dostaw-gazu,3114_0_0_0_0.html [date of access: 2011.11.02].

[22] *Powrót do pomysłu Bernau-Szczecin?*, www.rp.pl/artykul/71 1077.html [date of access: 2011.11.02] *Bartimpeks sprzedaje PGNiG*

It is worth adding that Poland has already opened a pipeline connection with the Czech Republic and Germany, and is carrying out market research before deciding to construct another pipeline connecting it with Lithuania. The latter seems to be highly advantageous for both countries. Lithuania is totally dependent on Russian gas, which in case of any interruption puts the small country at risk, and Poland's gas infrastructure in the north-east corner of the country is particularly badly developed, which might be rectified if the connector was constructed[23].

LNG TERMINAL

Apart from constructing new pipelines, natural gas supplies to Poland will be diversified by placing a LNG (Liquified Natural Gas) terminal on Poland's Baltic shore. This project had been talked about within Poland's authorities circles for years and the green light was given in 2008, and the terminal was situated in Świnoujście in the north-western corner of the country. It is projected that in the first years of its operational activity the terminal will be able to receive 5 b m^3 of the fuel a year, with future capabilities of 7,5 b m^3. What is important, the terminal will be equipped with two gas storages with operational capacity of 160 000 m^3. The facility will be open at the turn of 2013/2014[24].

This way of diversifying natural gas supplies has a lot of advantages. First, the whole characteristics of such terminal does not limit the choice of the source of fuel geographically. The main factor determining purchasing this natural gas and not that one will be economic conditions, not geographical or historical ones, which will be quite a new fact as far as Poland's natural gas trade is concerned. Thus it is natural to consider buying gas through the terminal from Qatar, Algeria, Libya, Egypt or Norway. Fuel from these directions may satisfy over 50% of Poland's natural gas demand when the terminal becomes fully operational. The terminal will also make it possible for Poland to alter the way gas is transported. Third, the country's natural gas market will become more flexible, for there is no need to use pipelines to bring the imported fuel to the terminal. When the importer and the exporter do not have to be linked by pipelines, the importing country is less vulnerable to blackmail.

One must remember that the price of LNG delivered by sea is 20-30% higher than the one delivered by pipelines. All in all, however, Poland's authorities decision to construct the LNG terminal in Świnoujście is regarded to be a very positive one, for the number of advantages is higher than disadvantages. Of course, there is still much to be done by the government and investors (new suppliers, buying a fleet of tankers, searching for Poland's own sources for natural gas abroad), but this investment has a very good chance to start real diversification of Poland's natural gas supplies.

As has been stated earlier in the article, diversification of supplies occurs within two fields – geographical one (different directions of supplies) and infrastructural one (developing energy infrastructure and creating different means of producing energy). The former has just been discussed above, the latter, including nuclear energy issue and renewable energy sources will be touched upon below.

SHALE GAS

Currently shale gas is being talked about by each and every energy industry specialist around the world. It is so because in 2009 a US company developed the latest technique that tapped the previously inaccessible supplies of natural gas and spread it to the rest of the world. Specialists say it might change the geopolitics of natural gas, and increase the fuel's resources for at least 20%, conservatively estimating. It is also stressed that more extensive use of natural gas will reduce CO_2 emissions, for gas produces less greenhouse pollution than coal and oil[25].

Estimates state that more than 5 trillion m^3 of shale gas might lay under the territory of Poland. The stratum of shale extends from the Baltic coast, via central Poland to the south-eastern corner near Zamość. It lays between 1200-4500 m under the ground, so it means that the gas field is similar to this in US, which proved so rich in the fossil fuel. With around 14 b m^3 a year of Poland's natural gas consumption, the country might become a net exporter of the fuel in the future. It will be so on the condition that the authorities provide well-thought policy that will ensure a long-lasting process of shale gas exploitation. All this means that Poland is about to enter a very interesting period of its energy history[26]. Shale gas ex-

projekt rurociągu Bernau-Szczecin, www.forsal.pl/artykuly/454486, bartimpex_sprzedaje_pgnig_projekt_gazociagu_bernau_szczecin.html [date of access: 2011.11.02].

[23] *Połączenie gazowe z Litwą korzystniejsze dla naszych sąsiadów?*, www.gazownictwo.wnp.pl/polaczenie-gazowe-z-litwa-korzystniejsze-dla-naszych-sasiadow,154099_1_0_0.html [date of access: 2011.11.02].

[24] A. Toś, *Ocena budowy w Polsce terminala do odbioru skroplonego gazu ziemnego (LNG) w kontekście dywersyfikacji dostaw gazu ziemnego*, „Raport Pułaskiego" 2010, nr 4, p. 10-11.

[25] C. Krauss, *New Way to Tap Gas May Expand Global Supplies,* www.nytimes.com/2009/10/10/business/energy-environment/10gas.html_r=1&partner=rss&emc=rss&src=ig [date of access: 2011.11.12].

[26] *Shale gas to boost Polish energy sector*, www.en.poland.gov.pl/Shale,gas,to,boost,Polish,energy,sector,11107.html [date of access: 2011.11.12].

ploitation seems to be a very good chance for Poland to become independent from Russian natural gas. It will take years before it materializes, but with some help from American companies, which are trail blazers in the newest technology of releasing shale gas from the depths of our planet, it is highly possible. But it is important that the authorities understand the importance of these developments, and are acting to make sure Poland's energy sector grows as strong as ever.

SUMMARY AND CONCLUSION – POLAND'S POSITION ON ENERGY CHESSBOARD IS ABOUT TO CHANGE

As has been presented in the above article, the issue of energy safety in case of natural gas supplies is not an easy one. There are so many factors contributing to security of supplies in this very sector of energy policy, that is seems almost impossible to have them all in place at one time. Moreover, the situation of Poland as to this issue is heavily influenced by both historical and geopolitical factors, which makes things even worse. So, there must be, and there are, certain actions aimed at diversifying the structure of gas supplies, and there are different ways to do so.

First of all, Poland's gas pipeline network is of east-west orientation, for the country has been dependent on Russian natural gas for decades. As late as 2011, Poland's authorities finally opened a pipeline of north-south direction. Another one, connecting Poland and Lithuania is in the last stage of planning. These two might be highly important for both sides, as all of them, but especially the Baltic republic, are dependent on Russian supplies. Opening the Poland-Czech Republic connections opens the way to get the fuel from the planned Nabucco pipeline through Austrian and Czech pipeline networks, which will further diversify the supplies geographically. At the same time Poland is considering being connected to German pipeline system, which is even of more importance provided that if Warsaw starts buying gas from Berlin it will not be Russian gas, but, for example, German or Norwegian.

Another very important way to prepare ground for diversification of supplies geopolitically is to construct an LNG terminal in Świnoujście. When this facility becomes operational, Poland will buy liquefied gas mostly from Qatar. However, the country must order the fuel from other exporters, for the quantity of the already contracted Qatar gas is far from enough to satisfy the technological capabilities of the terminal. The facility must not only work to diversify Poland's gas supplies, but also be economic in the face of the energy market which is still undergoing deep liberalization.

A totally new issue has emerged lately in the field of Poland's energy safety – shale gas. It turned out the country might be highly rich in this type of natural gas right after the Americans introduced a new way to release it from previously inaccessible sites deep under the ground. Specialists say that if Poland's shale gas deposits are confirmed, the country may even become an exporter of the fuel, which will reshape the European energy map quite significantly. As of now, many international companies are carrying out drilling searching for the gas, exploiting of the fuel might begin in 2014. One thing is important here – some in Poland believe that selling drilling licenses to foreign companies might be dangerous, because once a drilling proves effective, Russia's Gazprom or other businesses may simply purchase such a company and gainthe influence on Poland's emerging shale gas market.

What one cannot forget about here is the fact that within the field of energy policy Poland, as every country, acts only in a broader, geopolitical context. Energy policy is a game of influence and control, far-sighted decisions, and, last but not least, luck of possessing rich resources of fossil fuels. Traits of this game are clearly visible in, for example, Russia's pulling off the Nord Stream project – now it can easily blackmail Ukraine or Belarus, depending on these two countries' attitude towards Russian policies. Poland has been so far relatively vulnerable within this chessboard of relations because of its dependency on Russian natural gas. Russian Federation openly states it wants to gain geopolitical advantage through its natural resources export. That is why the country is not willing to co-operate with the EU in this field, it prefers to pick several EU members and do business with them separately, which seems to be an easier task. Moreover, the European Union has not until lately provided its members with proper regulations concerning the time of energy crises and energy solidarity – for example as late as 2006 it started creating an internal natural gas market, and anti-crisis solidarity law is in the process of bringing it into practice right now (the end of 2011). Despite the fact that the EU is trying to lessen its dependency on Russian natural gas, by, for instance, forcing member states to consume energy more effectively or rising the level of energy produced from renewable sources in the general energy balance up to 20% in 2020, it will still grow even up to 84% in 2030.

POLSKA RÓWNOWAGA ENERGETYCZNA I JEJ PRZYSZŁOŚĆ. PROBLEMATYKA BADAWCZA GAZU JAKO ŹRÓDŁA ENERGII

Streszczenie

Celem artykułu jest przedstawienie gazu naturalnego jako jednego z najważniejszych zdaniem autorów surowców energetycznych w obecnej i przyszłej polityce energetycznej Polski. Polityka energetyczna polskiego rządu w obszarze gazu jest obecnie kształtowana głównie przez trzy czynniki:
– strategię uniezależnienia się od dostaw gazu ze wschodu i związaną z tym rozbudowę infrastruktury przesyłowej w kierunku północ–południe oraz droga morską;
– prowadzone na szeroką skalę prace poszukiwawcze na złożach gazu łupkowego;
– konieczność spełnienia wymogów określonych w polityce energetycznej Unii Europejskiej oraz wymogów pakietu klimatycznego.

Realizowane obecnie inwestycje w obszarze polskiej polityki energetycznej autorzy postrzegają jako spójne, zaplanowane i celowe, prowadzące do zwiększenia bezpieczeństwa energetycznego Polski. Za najważniejsze należy uznać budowę gazociągów łączących polskie sieci przesyłowe z sieciami na Litwie, w Czechach i Niemczech. Mimo wątpliwości związanych z wyższymi kosztami produkcji gazu, równie ważne strategicznie są budowa gazoportu w Świnoujściu oraz poszukiwania złóż gazu łupkowego. Zdaniem autorów, w perspektywie kilku lub kilkunastu lat status Polski na energetycznej mapie świata może się radykalnie zmienić, z kraju uzależnionego w dużej mierze od importu surowca z Rosji, na kraj eksportujący nadwyżki zakupionego oraz pozyskanego z własnych zasobów gazu naturalnego, posiadający kilka alternatywnych dróg pozyskania tego surowca.

SŁOWA KLUCZOWE: polityka energetyczna, gaz ziemny, źródła energii, Polska, Rosja, Unia Europejska