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A new prospect of Poland's gas security

Abstract. *The text addresses the issues of energy security as exemplified by Poland's gas security. The material scope of the analysis has been broken down into three main aspects: (1) natural gas resources in Poland in general, (2) unconventional gas resources in Poland, (3) and the development of the domestic gas infrastructure. A characterization of these three elements may point to "a new prospect of gas security," which we may witness in Poland in 2022.*

With the goal of elaborating the addressed issues of gas security, the text aims to answer the following questions: (1) To what degree will the potential of gas resources and of the development of the domestic gas infrastructure affect Poland's energy security?, (2) What factors affect the under-utilization of Poland's gas potential?, (3) Is it justified to assume that the new "prospect of gas security" will eliminate "political and external factors" that negatively affect the current state of Poland's energy security?

Keywords: *energy security, gas security, energy policy, Poland's energy security*

Introduction

The text aims to analyse gas security as an element of Poland's energy security, which has been broken down into a description of three potentials: (1) natural gas resources in Poland in general, (2) unconventional gas resources in Poland, (3) the development of the domestic gas infrastructure. A characterization of these

three elements may point to “a new prospect of gas security,” which we might witness in Poland in 2022. The analysis will be of speculative character, namely it will approach the issue on the basis of a qualitative extrapolation.

The research issue addressed in the introduction should be elaborated with the aid of the following research questions: (1) to what extent will the potentials of gas resources and of the development of the domestic gas infrastructure affect Poland’s energy security?, (2) what factors affect the insufficient fulfilment of Poland’s gas potential?, (3) is it legitimate to assume that the new “prospect of gas security” will eliminate “political factors” as well as “external factors” that negatively impact the current state of Poland’s energy security?

Energy security can be examined on the grounds of various perspectives and scientific disciplines.¹ Hence, it is difficult to present complementary and exhaustive analyses for that matter. Still, it is worthwhile affirming that the burden of energy security, of the analyses, etc., is conditioned by the provenance of a given discipline represented by the researcher. And so it must be concluded that the material scope of the energy security analyses is frequently incomplete and focuses on selected components. The issue of the gas supply security can also be considered against the backdrop of various perspectives – ranging from the political, to technical, to environmental, to economic ones. By way of illustration, the activity of gas transmission, distribution and storage requires technical capabilities in this respect, and the gas trade must be related to the consumers’ current and projected demand for the raw material, while technical, economic and environmental costs must be taken into account.²

From the standpoint of methodological and theoretical approaches, one might consider the plausibility of the researched reality, to wit the state of energy security. At this point we can refer to two extreme methodological and theoretical trends in political sciences: (1) positivism and (2) interpretationism. In the first case it is assumed that the researched reality exists in reality, and so is not discursive, whereas in the latter case reality is an object of competition in the realm of narrations, which are contentious and essentially represent specific values.³ While

¹ A. Cherp, J. Jewell, *The three perspectives on energy security: intellectual history, disciplinary roots and the potential for integration*, “Current Opinion in Environmental Sustainability” 2011, No. 3, pp. 202-212.

² Ustawa Prawo energetyczne z dnia 10 kwietnia 1997 r., Dz.U. z 1997 r., nr 54, poz. 348 ze zm.; M. Domagała, *Bezpieczeństwo energetyczne. Aspekty administracyjno-prawne*, KUL, Lublin 2008, pp. 13-60; R. Rosicki, *Pojęcie i definicje bezpieczeństwa energetycznego*, in: *Bezpieczeństwo energetyczne Polski w Unii Europejskiej – wizja czy rzeczywistość?*, ed. T.Z. Leszczyński, WSIZiA, Warszawa 2012, pp. 35-66.

³ P. Furlong, D. Marsh, *A Skin Not a Sweater: Ontology and Epistemology in Political Science*, in: *Theory and methods in political science*, eds. D. Marsh, G. Stoker, Palgrave Macmillan, Basingstoke 2010, pp. 184-211.

analysing energy security one should bear this in mind and/or take into consideration the aforesaid perspectives. For instance, the discourse on the necessity to decrease the import dependence is of no avail if we do not dispose of technical capabilities to diversify the directions and sources of energy supply. The same problem applies to the creation of a competitive market. It is not possible to increase competitiveness if transmission infrastructure is lacking, whereas the sector is unique in that it poses a number of “barriers to entry.”⁴

The normative approach to the term „energy security” is contained in the juridical definition presented by the Polish legislator in the Energy Law Act. The defining of the term “energy security” reads as follows (Art. 3, item 16): “the state of economy that makes it possible to cover the consumers’ current and projected demand for fuels and energy in a technically and economically well-founded manner, while meeting the demands of nature conservation.”⁵ This approach can actually be broken down into several basic elements of (1) economic, (2) social, (3) environmental, and (4) technical nature. All these should be considered within each prediction of Poland’s gas potential. It is also worth emphasising that the Polish legislator, as part of the legislative work driven by the requirements of the European Union, attempted to single out the issues of conducting economic activity in the field of natural gas transmission, distribution, sale, storage and pipeline transport, export, liquefaction and regasification in a separate legal act, that is the Gas Law Act. The Draft Act also included the juridical definition of the term “gas security,” which is essentially the same as the above-mentioned definition of “energy security.” The only difference is the reference made to the aim of the “security of natural gas supply,” that is the provision of “common security.”⁶

1. A potential of natural gas

According to the 2014 data from the State Geological Institute the amount of recoverable natural gas in Poland is estimated at 129.75 bn m³. The estimate applies to the so-called economically feasible and infeasible resources, to wit the total amount of mineral within the deposit. The resources extracted from the developed deposits of natural gas have been estimated at 106.8 bn m³. However, it must be pointed out that the quantity of industrially viable deposits of natural gas

⁴ R. Rosicki, *The notion of energy security in the European Union*, www.jdsupra.com/legalnews/the-notion-of-energy-security-in-the-eur-52748 [18.06.2015].

⁵ Ustawa Prawo energetyczne z dnia 10 kwietnia 1997 r., Dz.U. z 1997 r., nr 54, poz. 348 ze zm.

⁶ Projekt Ustawa Prawo gazowe z 9 października 2012 r. Wersja 2.004, Ministerstwo Gospodarki 2012.

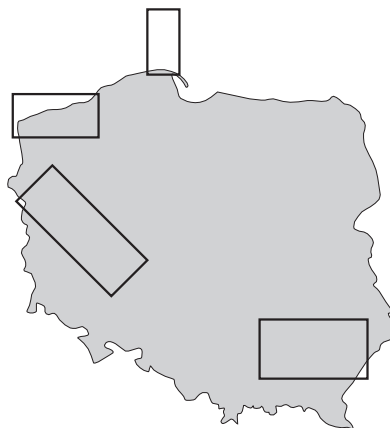


Figure 1. Main deposits of crude oil and natural gas in Poland

Source: own study on the basis of the State Geological Institute.

have been assessed only at 57.30 bn m³.⁷ This remark is of some import given the evaluation of Poland's real potential in relation to the diversification of gas supply, and by extension in relation to the evaluation of gas security. The industrially viable deposits are the ones that can be subjected to a real activity of extraction, while taking into account the fulfilment of technical, economic and environmental conditions. Focusing on industrially viable resources is of importance in short-term forecasts, but basing long-term forecasts on industrially viable reserves may be of less importance, given the advancement in extraction technology.

One should pay attention to the geographical distribution of the hydrocarbon mining industry in Poland, which is of significance for the evaluation of the economic potential of particular regions in the country. The largest deposits are located in the Polish Lowlands (69%), in the Carpathian foreland (26%), the Baltic Sea area (4%), and the Carpathians (1%) (see Figure 1). Additionally, the reserves of the so-called nitrogen natural gas should be taken into account; its deposits are located in the Polish Lowlands (deposits at Cychry and Sulęcín). As the State Geological Institute emphasises, this type of gas can be used for the production of liquid nitrogen, but it is most often used for the adjustment of the chemical composition of the gas transported within the domestic transmission and distribution infrastructure.⁸

⁷ *Bilans zasobów złóż kopalin w Polsce według stanu na dzień 31.12.2014 r.*, PIG, PIB, Warszawa 2015.

⁸ *Azotowy gaz ziemny*, http://geoportal.pgi.gov.pl/surowce/energetyczne/azotowy_gaz_ziemny [10.06.2015]; *Bilans zasobów złóż kopalin w Polsce według stanu na dzień 31.12.2014 r.*, PIG, PIB, Warszawa 2015.

It is worth comparing the Polish gas resources to the output and to the import dependence. According to the Energy Regulatory Office the gas supply from abroad in 2014 amounted to 10.4 Mtoe, while the domestic output was 3.8 Mtoe. A substantial quantity of the foreign gas supply came from the “eastern direction,” the “Yamal Contract” import accounting for 7.8 Mtoe.⁹ This means that the Gazprom import into Poland accounted for 75% of the total import. The issue of import dependence on one direction – the Russian one – has been a much-discussed political topic, as well as has featured in numerous election campaigns. The said import dependence is viewed as one of the major factors that might considerably influence the security of gas supply. Apart from the plausibility of the disruption of supplies from the eastern direction, the lack of transmission infrastructure has certainly influenced the great bargaining power of Gazprom; by extension, the earlier lack of infrastructural strategies to be efficiently implemented influences the pricing of the gas supplied to Poland.

2. The potential of unconventional gas

In 2013 the estimates of the shale gas resources were presented by the Polish Geological Institute in collaboration with the United States Geological Survey. The size of the projected deposits was based on the data from 1950-90, which were concerned with the shale formations from the Lower Palaeozoic in the Baltic Basin and Podlachia-Lublin Basin. With the aid of this data it was estimated that the extracted gas resources on land and shelf might amount to a maximum of 1920 bn m³. However, considering the estimation parameters, the probable resources were assessed at 346-765 bn m³.¹⁰ Noteworthy, these estimates were not the first ones presented by state institutions. For instance, in the 1980s a team of scientists from the Polish Geological Institute estimated the unconventional gas deposits at 665 bn m³, whereas a team from the University of Science and Technology provided the figure of 402 bn m³ in the 1990s. The latter estimate was verified in 1996 – the mean amount of the reserves was then evaluated at 1595 bn m³, the range being 799-2393 bn m³.¹¹

⁹ *Charakterystyka rynku gazu 2014*, www.ure.gov.pl/pl/rynki-energii/paliwa-gazowe/charakterystyka-rynku/6161,2014.html [1.06.2015].

¹⁰ *Bilans zasobów złóż kopalin w Polsce według stanu na 2012 r.*, PIG, PIB, Warszawa 2013, pp. 16-17; R. Rosicki, *Assessment of shale gas potential in Poland (2014)*, www.jdsupra.com/legalnews/assessment-of-shale-gas-potential-in-pol-79130 [18.06.2015].

¹¹ M. Rutkowski, *Gaz pojawia się i znika, czyli krótka historia szacowania zasobów węglowodorów niekonwencjonalnych w Polsce*, „Przegląd Geologiczny” 2013, Vol. 61, No. 1, pp. 331-333.

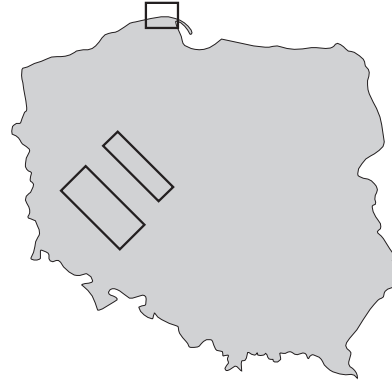


Figure 2. Prospective areas of tight gas

Source: own study on the basis of the State Geological Institute.

In 2014 the Polish Geological Survey put forward a report entitled The forecast natural gas resources in selected compact reservoir rock in Poland, which contained estimated tight gas resources.¹² The forecast was based on various prediction methods and techniques. To effect the prediction geological information from more than 500 drillings was used, as well as available data from approximately 30 drillings. These data were supplemented with new information from the companies that had performed exploratory drillings. Three geological groups were subjected to the analysis: (1) the Poznań-Kalisz zone (rotliegend sandstones), (2) the Greater Poland-Silesia zone (carboniferous sandstones), (3) a part of the Baltic Basin (Cambrian sandstones). The results of the prediction were the estimates of the tight gas reserves of 1528-1995 bn m³ (see Figure 2). The greatest potential of the geological tight gas reserves was ascribed to the Great Poland-Silesia zone (57-75%), whereas the second biggest prospective area is to be the Poznań-Kalisz zone. The analysis did not include the tight gas reserves, which had been found earlier in the so-called “deposit traps”.¹³ It follows that there is a considerable potential of unconventional gas in the western part of Poland too. It remains an open question what kind of industrially viable resources we might be dealing with here. It is estimated that the reserves might account for 153-200 bn m³.¹⁴

¹² *Prognostyczne zasoby gazu ziemnego w wybranych zwięzłych skałach zbiornikowych Polski*, PIG, PIB, Warszawa 2014, pp. 5-58.

¹³ *Ibidem*; P. Poprawa, H. Kiersnowski, *Zwięzłe formacje zbiornikowe (tight reservoir) dla gazu w Polsce*, „Biuletyn PIG” 2010, Vol. 439, pp. 177-180.

¹⁴ *Ile mamy gazu uwięzionego? Informacja prasowa*, 2015, PIG-PIB, pp. 1-2.

As regards the interest in shale gas exploration licences evinced by foreign investors, there was some dynamics in the term of the first PO-PSL (Civic Platform-Polish Peasants' Party) government coalition (2008-2009). Towards the end of the first PO-PSL coalition, and at the beginning of the second coalition (2011-2012) the interest began to wane, which should be ascribed to (1) the enduring ambiguities in the legislative process concerned with the legal acts regulating hydrocarbon extraction and trading; (2) a lack of coherent vision on the part of those in power as to the role of shale gas in Poland's energy policy; (3) a lack of unequivocal and steady visions of extraction activity taxation; (4) the post-audit appraisal by the Supreme Audit Office of the state institutions in respect of gas exploration, extraction and development of shale gas reserves in the years 2007-2013.

The state of legislative and organizational work of the Polish authorities is best captured by the main statements in the report by the Supreme Audit Office, which pointed out: (1) the prolonged legislative work on the regulations concerned with hydrocarbon exploration and extraction, (2) a lack of a proper body coordinating the hydrocarbon extraction, (3) a lack of a government strategy for the use of shale gas and for the synergy of the potential "shale gas revolution" and the whole of the economy, (3) an inefficient operation of the Ministry of the Environment as regards the ministry operation organization (e.g. organizational shortcomings concerned with the ministry administration responsible for licensing). By and large, the issues of the responsibility of the Ministry of Economy for the energy policy, and in particular cases also of the Ministry of the Environment point to the necessity to establish a more efficient and separate Ministry of Energy and Sustainable Development, (5) an improper licensing process (including the scope of granted licences, not taking into account the financial or technical potential of the companies, *inter alia*), (6) problems of prolonged and negligent processing of licensing applications from entrepreneurs, as well as unlawful way of paying concession fees and fixing payment deadlines. Moreover, arbitrariness of proceedings and unfair treatment of applicants, (7) a lack of credible, definitive and reliable estimates of shale gas resources in Poland, despite the fact that state institutions were involved in the assessment of the reserves, which serves to highlight the incompetence on the part of the state authorities as regards the work on the improvement of the country's energy security, (8) a lack of activity undertaken with a view to limiting the corruption-fostering areas and mechanisms concerned with the licensing process (exploration licences), (9) a relatively slow pace of exploratory drilling procedures. These in turn are necessary for a thorough estimation of the resources, (10) defective results of geological drillings (including the failure of the samples to meet quality standards, (11) an ineffective supervision by the mining authorities of the entrepreneurs' operations as far as environmental protection standards are concerned, (12) a lack of reliability on the part of some entrepreneurs

conducting exploratory activity as far as the tasks and obligations following from exploration licences are concerned.¹⁵

Given the fact that all the major international companies specializing in unconventional gas extraction have backed out of the Polish market, the Sejm Economic Committee was convened 8 July 2015 – the appraisal of the work so far conducted on the detection of the resources was not positive. It must be pointed out that the pace of exploration of shale gas resources has decreased, which is chiefly caused by subsequent foreign gas exploration licence-holding companies backing out of the Polish market. In mid-2015 only two drillings were performed, which compared to 2014 was a negligibly meagre number. In 2010-2015 seventy exploratory boreholes were made; the greatest number – 24 – was made in 2012. At the peak of gas prospecting in Poland, that is in 2012-2013 thirty eight boreholes were made. In mid-2015 two drillings were performed, compared with three planned for the whole year.¹⁶ Moreover, in 2015 forty licences were in use; these were held by 11 entities (10 capital groups); last year a dozen or so concessions were put in for pursuant to the as-yet-unamended law.¹⁷

The instability of the legal situation and a lack of a coherent vision have given rise to an unfavourable investment atmosphere for foreign investors. Besides, the ideas of taxing the extraction activity surely did not have a positive effect on long-term planning of upstream activities.¹⁸ It must be stressed that the very process aimed at recognizing deposits is capital-intensive; for instance, one drilling with a complete round of hydraulic fracturing is estimated at 15 million dollars. In order to obtain a reliable estimate of the unconventional shale gas resources in Poland, approximately 300 exploratory drillings are needed, which means that the costs of the recognition stage in this respect amount to 4.5 bn dollars.¹⁹ Other data demonstrate that while holding a concession 80 so-called pads can be drilled (that is, parts of the concession segments), and with one pad 12 drillings can be made, and then the number of drillings for a concessional area can be as high as 960.²⁰

¹⁵ *Poszukiwanie, wydobycie i zagospodarowanie gazu ze złóż łupkowych*, Najwyższa Izba Kontroli, Warszawa 2014; R. Rosicki, *Assessment of shale gas potential in Poland*, 2014, www.jdsupra.com/legalnews/assessment-of-shale-gas-potential-in-pol-79130 [18.06.2015].

¹⁶ *Stan prac poszukiwawczych za gazem łupkowym – maj 2015 r.*, <http://info.lupki.pgi.gov.pl/pl/stan-prac-poszukiwawczych/aktualnosci/stan-prac-poszukiwawczych-za-gazem-lupkowym-maj-2015-r> [15.06.2015]; *Zestawienie prac rozpoznawczych za gazem z łupków – zakończonych i będących w trakcie, stan na dzień 04.05.2015 r.*, Ministerstwo Środowiska, Warszawa 2015.

¹⁷ A. Sofuß, *Łupkowy szok poznawczy*, http://gazownictwo.wnp.pl/lupkowy-szok-poznawczy,253655_1_0_0.html [11.07.2015].

¹⁸ P. Turowski, *Gaz łupkowy w Polsce – szanse, wyzwania i zagrożenia*, „Bezpieczeństwo Narodowe” 2013, No. 2. Vol. 26, pp. 129-145.

¹⁹ M. Rewizorski, R. Rosicki, W. Ostant, *Wybrane aspekty bezpieczeństwa energetycznego Unii Europejskiej*, Difin, Warszawa 2013, pp. 270-274.

²⁰ D. Malinowski, *Sen o łupkach*, „Nowy Przemysł” 2012, No. 9, p. 72.

Taking into account the number of drillings made in 2010-2015, a theoretical assumption is due here, whereby the total recognition of the deposits can be attained only around the year 2030. The potential dynamics of prospecting can be upset by a malign interpretation of the European Union regulations as regards the environmental conditions for the drillings, for instance the Polish law prescribed that exploratory drillings up to 5,000 metres did not require any prior assessment of environmental effects. Hence, attention should be drawn to Poland's potential problems resulting from the need to ensure proper environmental conditions concerned with granting and using the permissions to explore, examine and produce hydrocarbons.²¹

Noteworthy, there are several problems concerned with the development of Poland's gas potential as far as shale gas is concerned. The first problem is the one of poor legislative culture of the Polish legislator, which is not able to put through a speedy and transparent legislative process. Even if legislative proceedings are fast-paced, then the legal solutions following therefrom are characterized by ambiguity and/or vagueness. The second problem concerns a lack of coordinated activity within the Polish energy sector, beginning with the mineral extraction figures and ending with electric energy transmission. This follows from the fact that the "energy" issues are governed by several ministries, e.g. the Ministry of Economy, the Ministry of State Treasury, the Ministry of the Environment, the Ministry of Agriculture. The "state's comprehensive energy policy" (as defined by the Energy Law Act), prepared every four years, is within the remit of the Minister of Economy. The third problem is the "energy policy" itself, that is its status as a document within the sources of law. It is worth remembering that the energy policy results from a resolution passed by the Council of Ministers, and so it is of internal character and only applies to organizational entities accountable to the body that issues a given normative act.²² Given the current legal situation, the problem is not the binding force of the state's energy policy for "other entities", but the accountability of the Minister of Economy and of the Council of Ministers for the failure to implement it. Hence, some serious thought should be given to a new formula of the energy policy shape.

²¹ G. Paździorek, *Dyrektywa 94/22/WE w sprawie warunków udzielania i korzystania z zezwoleń na poszukiwanie, badanie i produkcję węglowodorów oraz jej implementacja do prawa polskiego*, „Polityka Energetyczna” 2005, No. 8, pp. 431-439; S. Raszewski, J. Górski, *Energy Security or Energy Governance? Legal and Political Aspects of Sustainable Exploration of Shale Gas in Poland*, “Oil, Gas & Energy Law Intelligence” 2014, Vol. 12, No. 3, pp. 27-47.

²² M. Pawełczyk, B. Pikiewicz, *Polityka energetyczna*, in: *Prawo energetyczne. Komentarz*, ed. M. Pawełczyk, Iuris, Poznań 2012, pp. 430-482; M.A. Waligórski, *Polityka energetyczna państwa jako sektorowa polityka administracyjna*, „Biuletyn Urzędu Regulacji Energetyki” 2008, No. 4, pp. 69-74.

3. The potential of the domestic gas infrastructure development

The development of the transmission infrastructure in Poland is to drastically change the situation of the gas supply security and diversification in the nearest future. Certainly, in the year the “Yamal Contract” is terminated, Poland will be in a different negotiating position against Russia. Poland’s gas-related position will be entirely different, even if Russia maintains higher gas prices, given the “political factors.” Regarding the prediction of Poland’s increased demand for gas, still the imported volume of 10.2 bn m³ will have to be secured. However, in 2022 the breakdown of technical capabilities to import gas, that is from “the eastern direction” the volume will still amount to 10.2 bn m³, whereas from all the other directions the import capabilities will reach 28 bn m³.

It is worth juxtaposing the 2016 situation and the 2022 situation as regards the technical capabilities to import gas. This will afford a better picture of the situation and show the ongoing changes deriving their dynamics from the development of the gas infrastructure in Poland. In 2016 the LNG terminal will come into operation, whereas the year 2020 will mark the start-up of new connections, inter alia: Poland-Slovakia, Poland-Czech Republic (Hat), Poland-Lithuania. In 2022

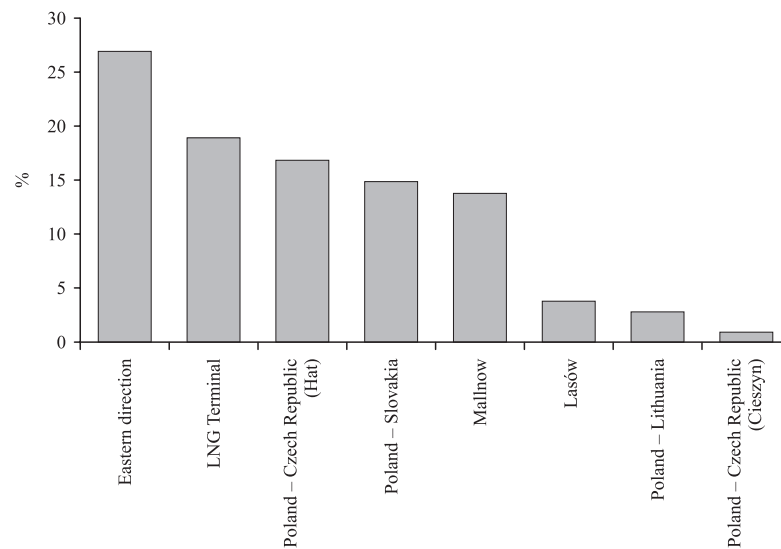


Figure 3. Poland’s technical capabilities to import gas in 2022 (in percentage points)

Source: own study based on PGNiG and Gas-System data.

the technical capabilities for import will attain the total throughput of 38.3 bn m³ (see Figure 3).²³

In 2022 the “eastern direction,” as part of the structure of technical capabilities for import, will account for 27%. Of great import will be the development of the transmission infrastructure from the “southern direction,” which in total will reach the 33% share in the structure of technical capabilities for import. Speaking of the “southern direction,” the following connections merit a mention: Poland-Czech Republic (Hat) – 17%, Poland-Czech Republic (Cieszyn) – 1%, Poland-Slovakia – 15% (see Figure 3). The infrastructural development in this direction is connected with the project of the so-called “North-South Corridor,” with a view to increasing Poland’s gas supply security, but also to making it possible to construct a more effective and competitive Poland-European Union energy market. This means that the Polish infrastructure will undergo a series of preparations that will allow a reception of gas from directions presently unavailable, e.g. from LNG terminals located in the Mediterranean Sea. Within its development plan, the Gaz-System S.A. Transmission System Operator provides for a construction of 2,000-kilometre long pipelines by 2023.²⁴

It is worth pointing out that in 2022 in respect of the transmission infrastructure gas security will increase substantially; still, it must be borne in mind that the infrastructure development will not necessarily strengthen Poland’s position, given a possible European Union-Russia energy conflict or other “political factors” connected with Russia. This is conditioned by the fact that Russia will continue acting as a significant gas provider for the European Union member states. And so any conflict resulting in a resort to a “gas blackmail,” will give rise to a disruption of gas supplies to Poland. It must be emphasised that the Russian invasion of Ukraine in 2014 *de facto* made it easier for Poland to present the fears concerned with the all too carefree energy relations of the European Union “old member states” with Russia. The idea of the Energy Union, raised by Donald Tusk for domestic politics purposes, gave rise to more dynamics in the discourse on energy in the European Union.²⁵ It must however be noted that the dynamics has decreased in 2015, and moreover, there is some information on subsequent gas investments

²³ *Plan rozwoju w zakresie obecnego i przyszłego zaopatrzenia na paliwa gazowe na lata 2014-2023*, Gaz-System, Warszawa 2014.

²⁴ *Ibidem; Lista projektów strategicznych dla infrastruktury energetycznej, w ramach programu operacyjnego “Infrastruktura i Środowisko 2014-2020”. Wersja 1.1.*, Ministerstwo Gospodarki, Warszawa 2015.

²⁵ R. Rosicki, *Commentary to the article by Prime Minister Donald Tusk concerning the proposal to create an energy union, which was featured in the Financial Times (A united Europe can end Russia's energy stranglehold, 21 April 2014)*, www.jdsupra.com/legalnews/commentary-to-the-article-by-prime-minis-17114 [18.06.2015]; D. Tusk, *A united Europe can end Russia's energy stranglehold*, “Financial Times”, 21.04.2014.

of Russia, that is the plans of the “Nord Stream 2” project. The implementation of this project would mean that 110 bn m³ will be transported across the Baltic Sea to Germany, the collateral effect being that Gazprom would discontinue the gas transmission across Ukraine.²⁶ In addition, another EU climate and energy package as well as member states’ internal policies on the development of renewable energy sources (e.g. the German ‘Energiewende’) will give rise to an increased rather than decreased gas import dependence in the nearest two decades.²⁷

It is also worthwhile drawing attention to the effects of earlier infrastructural neglect, which can be seen in high prices of the gas imported from the “eastern direction.” It must be recognized that the only factors giving rise to such a state of affairs are: (1) a “political factor” (recognizing Poland as a country unfavourable to Russia’s foreign policy), (2) an “infrastructural factor” (multi-year neglect as regards the direction diversification and sources of gas supply). For instance, an average price for 1000 m³ of gas, supplied by Gazprom to Western European countries in 2012 was 440 dollars, in 2013 – 385 dollars, and in 2014 – 341 dollars. At the same time the average gas price for Poland was 500 dollars (according to some press accounts it was as much as 525 dollars), 429 dollars and 379 dollars, respectively, the mean difference in the three-year period between Poland and the Western European countries being more than 47 dollars.²⁸ The real loss resulting from the operation of the “Yamal Contract” in that period may have amounted to 0.5 bn dollars annually in round figures (in relation to the average gas price applicable to the Western European countries).

Conclusions

The object of the analysis in this text is Poland’s gas security, which has been broken down into three elements: (1) a potential of natural gas resources in Poland in general, (2) a potential of unconventional gas resources in Poland, (3) a potential for the domestic gas infrastructure development. In its scope the analysis embraces the status quo and the changes, including the prediction of Poland’s gas security in 2022. The qualitative prediction provides that it can be assumed that

²⁶ *Nord Stream II to enhance reliability of Russian gas supplies to Europe*, www.gazprom.com/press/news/2015/july/article239944 [1.07.2015].

²⁷ Cf. A. Korytowski, *Wpływ Energiewende na inwestycje w źródła wytwórcze w Polsce*, in: *Europejski wymiar bezpieczeństwa energetycznego a ochrona środowiska*, eds. P. Kwiatkiewicz, R. Szczerbowski et al., Fundacja na Rzecz Czystej Energii, Poznań 2014, pp. 751-774; *Niemiecka transformacja energetyczna*, Heinrich Böll Stiftung, Berlin 2014, pp. 2-96.

²⁸ *Больше всех в Европе «Газпрому» платят македонцы и поляки*, 2013, <http://izvestia.ru/news/544100>, 01.02.2013; *Gazprom Annual Report 2014*, OAO Gazprom, Moscow 2015, pp. 77-85.

within the set time-frame there will be a qualitative change to Poland's gas security, which can be defined as the "new prospect of Poland's gas security." With a view to elaborating the said problem, the paper features three questions, which can be related to the following conclusions:

1. To what degree will the potential of gas resources and of the development of the domestic gas infrastructure affect Poland's energy security?

It must be pointed out that the lack of reliable and hard data on unconventional gas resources gives rise to difficulties concerned with a short-term and long-term prediction of Poland's gas security. However, one can theoretically assume that the industrially viable shale gas resources may amount to at least 50 bn m³; and similarly in the case of tight gas. Such an assumption means that even in relation to the theoretical prediction as to the gas resources, we can assume the proper annual extraction potential of 3 Mtoe of each of the two unconventional resource deposits. Potentially, we might assume that the domestic extraction of conventional and unconventional gas might be as high as 9-10 bn m³, which would substantially decrease Poland's gas import dependence. Still, such a prediction is subject to a wide margin of error. Even if we adopt such a variant the raw material exploration, extraction and investment processes should be made more dynamic. In the years to come this variant seems rather unlikely, which can be affected by "economic" and "organizational" factors; in the latter case the organizational weakness of the state structures comes to the forefront.

As regards the gas transmission infrastructure, Poland has made the greatest progress, which can be attributed to financial outlays, inter alia, by obtaining some support from the European Union, but also to the efficient management of the Transmission System Operator, that is Gaz-System S.A. On account of the prediction adopted in the text and concerned with the second decade of the 21st century, it is worthwhile to pay attention to the increase in the technical potential of the gas transmission infrastructure. The "eastern direction" share in the structure of import technical capabilities will only account for 27%. This means that Gazprom will not have a privileged position regarding the future technical capability to import gas to Poland. The higher prices of the gas imported from Russia are already economically unjustified; they will be all the more unjustified in the future. If the prices hold steady, then that will be through a "political factor." Given the development of the infrastructure, it is worth mentioning the decreased threat to Poland's energy security as far as Russia's potential resort to a "gas blackmail" is concerned. Still, the assumption will be of no import if the Russia-European Union conflict becomes more radical, for the bulk of the gas imported into the European Union still comes from the "eastern direction."

2. What factors affect the insufficient fulfilment of Poland's gas potential?

The main factors that affect the use of Poland's gas potential follow from: (1) the hardly efficient system of management organization on the executive author-

ity level, (2) the ambiguous status of the quasi-planning document of the “state’s energy policy,” (3) the instability and lack of transparency of legislation on the subject of energy and geology law, that is from the not-too-mature legal culture of the Polish legislator, (4) a lack of a coherent vision of the strategy to be adopted in the energy policy (not including the necessity to implement the European Union guidelines in the energy sector). A good solution would be to create a separate “ministry of energy and sustainable development,” however such an assumption does not emphasise the fact of appointing a minister as such, but rather the intellectual potential of the personnel that would fulfil new tasks within the ministry.

(3) Is it justified to assume that the new „prospect of gas security” will eliminate “political and external factors” that negatively affect the current state of Poland’s energy security?

A transition from the stage of the theoretical determination of unconventional resource deposits to the extraction of the industrially viable material would substantially influence the decrease in gas import dependence. The domestic “political factors” are concerned with bad organization, planning and a game played by lobby groups. All this negatively affects the “new prospect of Poland’s gas security” presented in the text. Besides, it must once again be stressed that “external factors,” e.g. the “gas blackmail,” will be diminished, but not eliminated. Hence, in conclusion, it must be pointed out that: the internal “political factors,” concerned with consistent governmental decisions, may in reality hinder the implementation of the strategy of the energy structure diversification, based on gas, while the external “political factors,” connected chiefly with the “eastern direction” will change in respect of their impact on Poland’s energy security.

The text does not analyse all the factors capable of affecting Poland’s gas security; while undertaking further research, it will be worthwhile investigating environmental and economic aspects of energy security. Certainly, in the case of unconventional gas extraction these would be of great significance, in reality influencing the implementation of gas projects. In addition, apart from the infrastructural aspect, the changes in Poland’s gas market will be affected by the liberalization processes as well as new gas trading instruments.

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Nowa perspektywa bezpieczeństwa gazowego Polski

Streszczenie. W tekście podjęta została problematyka bezpieczeństwa energetycznego na przykładzie bezpieczeństwa gazowego Polski. Zakres przedmiotowy analizy został sprowadzony do trzech głównych aspektów: (1) zasobów gazu ziemnego w Polsce w ogóle, (2) zasobów gazu niekonwencjonalnego w Polsce, (3) rozwoju krajowej infrastruktury gazowej. Dokonanie charakterystyki tych trzech elementów wskazywać może na „nową perspektywę bezpieczeństwa gazowego”, z którą możemy mieć do czynienia w Polsce w 2022 r.

W celu uszczegółowienia podjętej problematyki bezpieczeństwa gazowego w tekście podjęto się odpowiedzi na następujące pytania: (1) W jakim zakresie potencjały zasobów gazu i rozwoju krajowej infrastruktury gazowej wpłyną na bezpieczeństwo energetyczne Polski?, (2) Jakie czynniki wpływają na niedostateczne wykorzystanie potencjału gazowego w Polsce?, (3) Czy zasadne jest założenie, że nowa „perspektywa bezpieczeństwa gazowego” wyeliminuje „czynniki polityczne” i „czynniki zewnętrzne” mające negatywny wpływ na obecny stan bezpieczeństwa energetycznego Polski?

Słowa kluczowe: bezpieczeństwo energetyczne, bezpieczeństwo gazowe, polityka energetyczna, bezpieczeństwo energetyczne Polski