Robert Kłaczyński
Pedagogical University of Kraków (Poland)

Petrol and Natural Gas Market of the Visegrád Group Countries 1993–2016:
Current State and Prospects

Abstract: The paper addresses problems related to energy policies pursued by Central European countries. It identifies the amounts of energy resources in individual countries in the Visegrád Group as well as the transmission infrastructures they use for natural gas and crude oil. The author discusses projects aimed at diversifying energy supplies which are of key importance to V4 countries. The article also presents relations between those countries in both within the group and bilaterally. When outlining prospects of a V4 energy strategy, the account is taken of such vital aspects as relations with the Russian Federation and the contribution made by Visegrád countries to EU actions designed to develop a single energy market.

Keywords: energy policy; energy; security; natural gas; crude oil

Introduction

The Visegrád Group was set up in 1993 to coordinate the actions undertaken by its member countries to further their prospects of EU and NATO membership.¹ By engaging in close cooperation, V4 members were to improve their bargaining position in contacts with Euro-Atlantic nations and undertake joint initiatives to streamline their economic and political relations in Central Europe. Actions taken by Poland, the Czech Republic, Slovakia and Hungary were motivated by concerns about political stability and security in the part of Europe which was under the exclusive domination of the Soviet Union as recently as the 1980s (Gawron-Tabor, 2009, pp. 16–54). Whereas in the pre-accession period the V4 countries cooperated relatively well, they went their separate ways of national development after joining the EU

¹ The organisation initially existed as the Visegrád Triangle (Poland, Czechoslovakia and Hungary).
and NATO. Their political and economic interests often proved incompatible. Hence, after its members became part of EU and NATO, the activities of the Visegrád Group started to be very much superficial. That, however, is not true for all areas of potential cooperation as opportunities for constructive joint undertakings have always existed in the energy sector. The reason is that the V4 countries are dependent, albeit to a different extent, on energy supplies from the Russian Federation which uses crude oil and natural gas as tools with which to shape the political and economic reality in this area of Europe (Paniuszkin & Zygar, 2010, pp. 2–6). The tendency raises severe concerns on the part of some EU Member States. In spite of the circumstances, however, the V4 countries have failed to develop a common energy strategy. It seems that prompted by different factors, each of them tries to ensure its energy security by using its potential and looking for support among key EU Member States, especially Germany. The energy sector in the latter is linked to the energy sector of the Russian Federation, a fact which determines cooperation among the countries making up the European fuel market (Ćwiek-Karpowicz et al., 2012, pp. 1–28). Putting aside the existing differences within the Visegrád Group as to the future structure of the European energy policy, it would be hard not to notice the important energy projects which have been brought to fruition as a result of both cooperations within the Group as well as national energy strategies. Indeed, in the years to come, we should expect ever deeper cooperation to implement individual energy projects. Such projects, however, will not go beyond the local market. It will be difficult for the V4 countries to develop a single energy strategy structure because their political and economic differences motivated by national interests are too big (Kovacs et al., 2011, pp. 94–95).

The article will cover issues related to the production and transmission of natural gas and crude oil as well as the impact energy resources have on economic and political processes unfolding in the V4 area. It does not discuss problems concerning the production and transmission of electrical energy, management of hard coal deposits and renewable energy. By focusing on energy resources, we want to present their importance for the energy market in as much detail as possible. As the article is too short to contain an exhaustive discussion of the entire energy sector of the V4 countries, the author has selected what he believes to be its most important problems.

The research problems are focused on three major issues such as mutual dependency of energy resources exporter and importer, diversification of natural gas and petrol supplies to the V4’s market and importance of Russian Federation for the energy sector of the V4 countries.

The Visegrád Group states should coordinate their energy policies to intensifying efforts for creating common energy policy of the European Union however it is highly possible that despite political declarations, own and particular interests of the states in the energy sector will be dominant thus the negotiating position of the whole Group will be decreasing. The paper is based on Polish and foreign sources including monographs, collective reports, press articles and internet websites. Their scientific analysis will be done based on the case study method.

Among the V4 countries, the biggest potential to produce natural gas and crude oil is that of Poland. According to the Polish Geological Institute, recoverable reserves of the natural gas amount to almost 138 billion m³, 90% of which is in the development phase. Reserves of crude oil are between 24 and 25 million tonnes, with over 95% in development. Production of natural gas stands at 5.9 billion m³ annually, whereas crude oil is produced at the level of 0.66 million tonnes. Given the demand for natural gas and crude oil, however, Poland is forced to import the resources. It is done, on the one hand, using the Brotherhood pipeline which conveys supplies from the Russian Federation via Ukraine to the EU Member States, including Poland; and on the other, the Jamal pipeline going through Belarus. When assessing Poland’s energy security, we also need to take account of the fact that the country operates a network of gas storage facilities. As a result of modernisation, their capacity has been boosted to 2.9 billion m³. This translates into almost 20% of annual demand. The biggest storage facilities as located in Husów, Strachocina, Kosakowo, Wierzchowice, Mogilno and Brzeźnica. It seems necessary that these should be expanded and modernised or even that new installations for the storage of the ‘blue fuel’ be built. Poland intends to achieve this objective with the help of EU funds (Ciechanowska, 2016, p. 5). In addition, the country has potential capacity to produce shale gas. At present, however, it would be difficult to estimate the size of reserves and the probability of their development. Prospecting works are still in progress, no legal framework have been defined to regulate the development of reserves and there are unresolved problems related to the technical aspect of shale gas production. Furthermore, there is the problem of environmental protection during the production of shale gas (Kłaczyński & Kozera, 2016, pp. 293–308).

Another country in the V4 group with a potential to produce natural gas is Hungary which has recently discovered major reserves of natural gas, estimated at almost 600 billion m³, near the Romanian border. The cost of extracting 1,000 m³ of gas present at a depth of 4,000 to 10,000 metres is estimated at USD 20.00. The reserves are to be developed by a Hungarian-Canadian energy consortium (Szcześniak, 2017). Importantly, Hungary carried through a serious reform of production, transmission and distribution of natural gas as soon as the country became independent in 1989. Some fuel market experts believe that the Hungarian model of managing the gas market is much more effective than the one set up by similar regulations adopted in Poland (Łucki & Wiernik, 2005). Hungary’s robust energy policy has resulted in the expansion and thorough modernisation of 5 natural gas storage facilities. These are used to store nearly 3.3 billion m³ of gas. Their storage capacity covers almost 75% of the annual demand for natural gas (Ciechanowska, 2016, p. 4). The country also has small reserves of crude oil. As recently as the 1990s, production of the ‘black gold’ amounted to almost 2.5 million tonnes, accounting for a major part of demand.
Today, however, it does not exceed 0.7 million tonnes which translates into a 29% share in the Hungarian crude oil market (Purvin, 2011).

The Czech Republic has the much more limited capacity to produce natural gas with annual extraction figures below 0.2 billion tonnes. Recoverable reserves are estimated at almost 4 billion cubic metres. Crude oil deposits, on the other hand, are put at 15 million tonnes. As for ‘black gold’, it is extracted in the Czech Republic in the amount of 0.1 million tonnes (WYD, 2017). Czech reserves of natural gas are located in South Moravia. The country has a well-developed transmission infrastructure with access to gas both through the Brotherhood system of pipelines as well as the Gazelle interconnector providing a link with the Opal transmission line used to transport gas to the Czech market from the North Stream main. Also, the country is connected to Austria and Poland through a network of interconnectors. In the former case, gas may reach the Czech market through a system of pipelines in the south of Europe. In the future, the gas supplying the Czech distribution system in this way will come from the Russian-Turkish project called Turkish Stream intended to ensure supplies of the ‘blue fuel’ to Southern Europe. In 1997, the Czech Republic signed a contract with Norway for the supplies of natural gas through a network of German pipelines. As part of cooperation with Germany, natural gas contracted to come from Norway is sent to other European countries whereas the Czech Republic gets the equivalent amount of Russian gas. Together with Hungary, the country also has the biggest natural gas storage facilities in the V4 group. Czech storage capacity amounts to 3.25 billion m³ with nine facilities located within the country. The capacity covers almost 50% of Czech demand for natural gas (Ciechanowska, 2016). Work is in progress to build the Moravia pipeline (Tyrdonice–Libhost) which should improve the distribution of natural gas in the southern, industrial part of the country, but it can also be used in the future to transport gas between Poland and Slovakia. Poland may also use the pipeline to convey gas from the LNG terminal in Świnoujście. Benefiting from the many opportunities to obtain gas, in October 2012, the Czech government and the government of Poland decided to sign a declaration of integrating their transmission systems. As a result, it will be possible to transport gas to the V4 countries from Germany, Norway and the Austrian gas hub in Baumgarten (Kal, 2013).

Compared to the other V4 countries, Slovakia is in a slightly worse position as regards energy security. It does not have any serious reserves of natural gas or crude oil (ROP, 2016). Reserves of the ‘blue fuel’ are estimated at just 14 billion m³ whereas those of crude oil are assessed at 9 million tonnes. Annual production figures do not exceed 120 million m³ for natural gas and 6,000 tonnes of crude oil (SL, 2017). Over the last years, the country managed to develop a system of gas storage facilities. It is made up of 3 storage facilities for natural gas with the total capacity below 2 billion m³. This translates into almost 74% of annual demand (Ciechanowska, 2016, p. 6). The Slovak authorities try to ensure energy

---

2 What is unlikely, however, is the completion of the Nabucco pipeline which is intended to send natural gas to Southern European fuel market by-passing Russia.
security by integrating the national system of natural gas distribution with the European transmission network. By 2020, they plan to have established cooperation with Poland to build an interconnector linking both countries which will make it possible to supply Slovakia during an energy crisis with surplus gas available to the Polish authorities. The role of the pipeline between Strachocin and the Polish border is also to ensure fluent supplies in the area of South-Eastern Poland and, in the future, enable natural gas supplies from the LNG terminal to Slovakia. Investment costs amount to PLN 365 million (GAZ, 2017).

V4 countries have significantly fewer problems with the supplies of crude oil. It is because oil is much more accessible than natural gas. The countries can import crude oil and ready-made fuels from the most prominent exporters. Cooperation within the Visegrád Group to manage the crude oil market is relatively smooth. Polish Orlen owns Unipetrol, a company which has majority shares in two Czech refineries in Litwinow and Kralupy. The capacity of Czech refineries to process crude oil is estimated at almost 9 million tonnes. Crude oil is transported to refineries through the Friendship main and the IKL transmission network. Due to economic considerations, most of the oil comes from the Russian Federation (GB, 2016). As the owner of the Czech refineries, Poland pinned some hopes on the opening of the Adria pipeline which can be used to transport crude oil both from the Adriatic Sea terminals as well as the Friendship pipeline to which Adria is linked. Given the fact that the main shareholder of Adria is the Hungarian company MOL, which competes with Orlen, we should assume that the Czech refineries will continue to be supplied from Russia to remain profitable (Maciążek, 2017). In 2003, talks were held between the Orlen authorities and MOL to create a joint energy corporation whose clout and importance would go well beyond the regional framework. Unfortunately, the merger did not work due to conflicts, differences in interpreting the situation in the fuel market, ambitions of management teams and the national authorities which hold considerable shares in the companies. To an extent, the failure was also brought about by unfavourable opinions of investors from Western European countries and the Russian Federation. According to some experts, failing to complete the merger, the V4 group lost an opportunity to have more say in the European fuel market (Wielowieyska, 2017).

The opening of the Adria pipeline combined with its extension by Friendship 1 will allow the Slovak authorities to strengthen the position of Slovakia as a transit country for Russian resources and increase the probability of preferential supplies to the Slovak refinery Slovanft in Bratislava. Its processing capacity is estimated at 6 million tonnes annually (Bytniewska, 2017). The biggest potential to refine crude oil is to be found in Poland where the combined processing capacities of the Płock (PKN Orlen) and Gdańsk (Lotos Group) refineries amount to 27 million tonnes (NAF, 2017). It is much more than the demand of Polish businesses. The petrochemical industry also incorporates local refineries in Jaslo,

---

3 Given that Orlen signed an agreement with the Saudi company Saudi Aramco, it is also possible to send crude oil to the Czech refineries from the Middle East (PKN, 2017).
Trzebinia and Gorlice. Polish refineries source crude oil from the Russian Federation even though they can import it from the Middle East via the Baltic Sea. They only use this latter option for small amounts, however. Such structure of the ‘black gold’ market is due to the ease of access to oil and its relatively low price.

The strategy entails the problem of being dependent on Russia which uses energy resources as a trump card to obtain political and economic concessions. In 2015, the share of Russian crude oil in the Polish refinery market was 88%, 1.4% being covered by Saudi Arabia oil, 2.4% coming from domestic deposits including wells in the Baltic Sea, and 1.2% imported from Norway (Apanowicz, 2017). When it comes to the processing of crude oil, Polish energy policy faces the challenge of German refineries being taken over by Russia, a step which may result in a future strengthening of their competitive advantage and raise a threat of weakening Polish petrochemical actors, if not eliminating them from the fuel market altogether. Hungary also has much potentials to process crude oil with its four refineries managed by MOL, a Hungarian energy consortium. The largest of Hungarian refineries, Danube, has a processing capacity of 8.1 million tonnes per annum. Also, in this case, crude oil sent for processing is mainly Russian (Kovacs et al., 2011, p. 53).

**V4 Response to the Growing Importance of the Russian Federation in the European Fuel Market**

The Russian Federation is a state with the largest global reserves of natural gas and considerable deposits of crude oil (Kłaczyński, 2010, pp. 35–58). It is the second producer of the ‘blue fuel’, after the USA, and the largest producer and exporter of crude oil. The rise of the Russian Federation on the international scene over the recent decade was made possible by persistently high prices for energy resources. Whenever there is a drop in demand for energy resources, revenues to the Russian budget are seriously undermined. A national economic system of this type is called a monoculture (Kisielewski, 2007, pp. 45–74). All this has a bearing on the energy policy pursued by the Russian authorities which regard it as part of foreign policy. Its objective is to strengthen the position of the Russian Federation all over the world and in particular in Europe (Molo, 2008, pp. 71–122). This raises serious concerns among V4 countries which point out potential problems with the continuity of supplies in the future. In their opinion, excessive dependence on supplies of natural gas and crude oil may have a negative impact on the foreign and interior policies in these countries. The ratio of V4 countries dependence on natural gas supplies amounts to between 55% and 90%. It is thus much higher than in the case of the other EU Member States whose level of dependence does not exceed 30%. This is the results of historical economic processes from 1945–1990 when V4 countries wherein the sphere of exclusive influence of the Soviet Union and it was the latter which was responsible for energy supplies (Slobodan et al., 2016, p. 33).

Using energy resources as leverage, the Russian Federation will be in a position to impact political and economic processes on an international scale. In spite of some consensus as
to the strategic objectives of Russian energy policy in Europe, no specific actions have been taken to counter it. The Czech Republic, Hungary and Slovakia cooperate closely with the Russian Federation in the energy sector counting on economic concessions and a chance to strengthen their position in the European fuel market. Their governments assume that failing to accept Russian energy projects, Central European countries will paradoxically lose in importance and stand a danger of being eliminated from the European fuel market as major players. A good example of this is the construction of the North Stream pipeline which was vociferously opposed by Poland. Instead of stopping the investment, the step only weakened Poland’s position in the market. Hence, rather than being passive in the face of projects initiated by Russia, other V4 countries prefer to participate in them. This kind of policy stands behind cooperation in the area of energy between Russia and Hungary.

As opposed to Poland, Hungary did not shy away from supporting the construction of South Stream which excluded Ukraine from the transmission system. The Hungarian authorities, unlike Polish ones, take the view that the problem Ukraine’s sovereignty and its place in the community of Western countries is of secondary importance. The South Stream project might have been abandoned, but a substitute Russian project called Turkish Stream, which serves similar political and economic interests, is now entering its implementation phase. Hungary hopes to become the other hub (besides Austria) for the distribution of natural gas to the European fuel market, which will bolster their position on the continent. In return for supporting the project, the Russians offered Hungary financial and technical aid necessary to modernise the nuclear power station in Paks (Sadecki, 2014, p. 1).

The Czech Republic follows a similar kind of policy, albeit with more subdued rhetoric. Czech opposition to the construction of North Stream was relatively weak which stemmed from the country’s energy strategy assuming that it will join the project once it is completed. Neither are there any signs of the Czech Republic being determined to block the North Stream II investment (Groszkowski, 2015, pp. 1 -2). Seizing upon the fact that the Opal pipeline, which is an offshoot of North Stream, runs along the Czech border, the country constructed the Gazelle interconnector with a capacity of 30 billion m3 of gas annually. It will thus diversify its transmission system for natural gas without having to change its supplier which will still be the Russian Federation. The project was funded entirely by Net4Gas which is part of the German energy corporation RWE. Once operational, the Gazelle pipeline will contribute to a further drop in the long-standing importance of the Brotherhood pipeline which has been used to send natural gas from the Russian Federation via Ukraine to the European fuel market. Currently, over 60% of imported natural gas is transported to the Czech Republic via the German market. The Gazelle pipeline will improve supply options and protect the Czech Republic from possible supply disruptions caused by the deepening conflict between Moscow and Kiev. The investment will also strengthen relations in the

4 In fact, the conflict over gas between Russia and the Ukraine started with the fall of the USSR. The Russians tried to take over the Ukrainian energy sector. Their current key objective is
energy sector between the three main beneficiaries of the project – Germany, the Russian Federation and the Czech Republic (Groszkowski, 2013, p. 1).

As for Slovakia, the country is not determined either to develop a coherent energy policy with the aim to weaken Russian impact and importance in the European fuel market. Slovakia strives to ensure energy security based on Austrian and Czech experiences. It is in cooperation with these countries that it intends to develop a regional market for natural gas. Using the gas supply point in Lanzhot, it wants to source gas from the Czech Republic which has access to a number of important gas transmission installations. If Russia completes the construction of North Stream 2, Slovakia will lose the position of a transit country. This is why it tries to respond to the new circumstances already today by creating a local gas hub based on the existing infrastructure. The Slovak authorities attach more weight to diversifying their transmission networks than natural gas supplies. The country is forced to look for future opportunities to use the enormous transmission potential offered by the Brotherhood pipeline whose throughput is estimated at 90-120 billion m3 of gas annually. Hence, the government approved the construction of an interconnector linking EU gas systems with the Ukraine which can be used to supply the Ukraine with EU gas in the amount of 14.6 billion m3 per annum. Paradoxically, however, before Gazprom offered a major discount, re-exported Russian gas was cheaper than the gas Russia supplied directly to the Ukraine (Dąbrowski & Groszkowski, 2015, pp. 1 -3).  

Set against natural gas, the market for crude oil is driven more by economic than political factors. As a consequence, cooperation between Russian producers of ‘black gold’ and their customers from the V4 group is better than in the case of gas. Refineries in the Visegrád Group countries process Russian crude oil which supplies their own markets as fuel and, in the case of surplus production, the markets in other EU Member States. What is problematic, however, is the high level of sulfation of crude oil, a disadvantage which is compensated by the fact that processing installations date back to the era when V4 countries were in the Russian sphere of influence and are adapted to receive Ural crude oil (Maciążek, 2017). On the other hand, over the next decade, we may expect a closer cooperation in the fuel market between Germany and Russia which would have adverse consequences, especially for Poland. The Russians are in the processes of acquiring more and more share packages in German refineries which they promise to get modernised in order to boost their capacity (Maciążek, to eliminate the Ukraine as a transit country for natural gas supplies to the EU (Szeptycki, 2008, pp. 97–136).

5 There have been a number of tensions and misunderstandings about investment implementation between the Slovak authorities and the Ukraine. This was partly caused by Slovakia’s fears of potential reaction from Russia which is interested in retaining its monopolist position as a supplier of natural gas to the Ukrainian market. As the fate of the Slovak-Ukrainian interconnector was being decided, Slovakia and Russia negotiated a contract for the supplies of Russian gas to Slovakia. The contract was to be binding for both parties for 20 years (Groszkowski, 2014, p. 1).
Gas supply terminals are also being modernised. We may assume that when the Russian energy strategy for crude oil is implemented, the product will be sent to German refineries on preferential terms to the detriment of Polish ones. In time, this may produce a situation where refineries would have to be sold to businesses enjoying relatively better relations with Russia than Poland. In such a case, our assets related to energy security would be weakened (Konończuk & Antas, 2010). This tendency is less important for other countries in the V4 group whose petrochemical industry is locally strong. In addition, compared to Poland, these countries are much more flexible in their economic relations, which includes their dealings with Russia in the energy sector. Good cooperation between Hungarian MOL and Russian energy companies is one example (Zsebesi, 2017). It resulted in an agreement between Hungarian authorities and the Russian company Surgutnieftiegaz under which Hungary acquired 21.2% of shares in MOL which were owned by the Russians. Just like the Polish political elite, Hungary tries to retain control over key energy companies keeping them in the exclusive remit of the central government. Due to the size of their fuel markets, a more liberal approach is taken by the Czech Republic and Slovakia (WĘG, 2010). In return for concessions for Hungary, Russia may count on closer cooperation within the Hungarian energy sector as well as support for Russian energy projects (Dąbrowski, 2012).

Energy Strategy of V4 countries within the EU

In 2013, V4 countries signed a preliminary agreement starting the process of developing a common, regional energy market and synchronising actions they take towards both third countries, meaning the Russian Federation, and EU Member States. The agreement has not been fully implemented, though. Several important regional investments were completed, but it is obvious that V4 countries pursue their own national strategies. They are also unwilling to coordinate actions in Europe and differ in their attitude to the Russian Federation. Attempts to introduce a principle of ‘energy solidarity’ were not clearly supported by V4 members. Poland has been left alone in its efforts to set up a common European energy market. The Czech Republic, Hungary and Slovakia are interested in cooperating with the Russian Federation, which is a function of their relations with Germany, a country emerging as a strategic gas hub or, as it were, a distribution centre of gas for the European fuel market. Such actions are currently impossible with no participation of Russia. Hence, Russian energy projects are not seriously opposed. Excluding Poland, the governments of V4 countries do not seem to be interested in Caspian projects to transport crude oil and natural gas either as they consider such initiatives to be unfeasible (Wańczyk, 2007, pp. 91–94). Neither are

6 The acquisition of MOL shares by the Hungarian government resulted in Hungary withdrawing its support for the Nabucco project and then supporting Russian plans to build South Stream, competing with the “south corridor”, followed by Turkish Stream when South Steam was abandoned for political reasons (armed conflict in the Ukraine).
they ready to cooperate with the Ukraine which is regarded as a source of destabilisation and an unreliable partner with Russia bearing upon potential relations. Consensus among the V4 countries is thus difficult to work out. Whereas Poland is trying to develop an energy strategy based on global mechanisms governing the fuel market, other V4 countries focus on local problems, assuming, quite rightly, that their tools of energy policy making are weak. This explains their concentration on local problems and actions taken to cover the losses suffered in the global struggle for natural resources and transmission systems by taking skilful decisions to become part of key projects in the European fuel market in the role of supplementary actors.

The dominant feeling in the Czech Republic, Hungary and Slovakia is political realism. Polish energy strategy, on the other hand, has a wider political dimension. Unfortunately, the strategy, being overly ambitious, does not strengthen our position in Europe. There is also much to be desired in the Polish natural gas and crude oil market which suffers from structural problems and a shortage of relevant legislation. This latter problem is best illustrated by the terrible management of the process of prospecting for shale gas. Seen as an institution, the EU itself cannot break the stalemate both when it comes to its foreign policy and energy strategy. It is indeed difficult to imagine any energy strategy in a situation where a decisive role is played by national strategies informed by the interests of individual countries. Therefore, it comes as no surprise that the European fuel market is dominated by countries exporting energy resources and especially the Russian Federation. The weakness of EU energy policy has a direct impact on the negotiating position and potential of the Member States including the V4 countries (Kaczmarski, 2010, pp. 54 – 83).

Conclusions

Given external factors, including the growing importance of the Russian Federation in the global fuel market, V4 countries should take more efforts to focus on developing a regional market for crude oil and natural gas. It is indispensable to build more interconnectors yet and modernise the technical infrastructure and storage facilities for natural gas. When negotiating with the Russian Federation, demands should be put forward to abandon the ‘take or pay’ rule. To safeguarding its political and economic interests, Poland should be much more flexible in its attitude to the projects suggested by the Russian Federation. Its current stiff opposition has not contributed to achieving the objectives related to the improvement of Poland’s energy security. Economic considerations should play a key role, whereas political ones, even though still important, cannot overshadow the interests of the V4 countries nor narrow them down to the national interests of individual members. It will be difficult for the Visegrád Group countries to increase their impact on EU’s energy policy. It seems that the dominant position of Germany which is strategically linked to the Russian Federation within the European fuel market will reduce the likelihood of developing a common, coherent structure for an energy strategy which would bring Europe together. Consequently, the
countries may only react to the projects of strategic importance while being proactive in the case of local projects which are equally important for energy security in the V4 group.

References:


Author

Professor Dr Hab. Robert Kłaczyński
Pedagogical University of Kraków, Department of Economy and Economic Policy.
Contact details: ul. Podchorążych 2, 30-084 Kraków, Poland; e-mail: robert.klaczynski@up.krakow.pl.