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Problems of functioning Polish LPG gas market in the context of the ongoing aggression of the Russian Federation against Ukraine

Introduction

The LPG market in Poland is one of the largest in European Union (EU). It is also the most developing market for liquid fuels in country, which is result of both attractive prices of this fuel for retail consumers and growing base of applications of this raw material in other areas of the economy. For ecological reasons, LPG has a number of benefits, such as lower CO_2 emissions. Moreover, in case of this fuel we are dealing with a mature technology, easily accessible to consumers and convenient to use [Złoty 2020]. However, the security of LPG supplies to the Polish market has been changed by the Russian Federation's aggression against Ukraine, which began in February 2022. While attention of media and politicians has focused on security of natural gas and crude oil supplies to Poland, bypassing Russian contractors, there is little talk of diversification directions of LPG import into the country.

The article looks at this problem. They are trying to assess whether actions taken by the government in this area have secured the Polish LPG market sufficiently against a possible suspension of LPG imports from the Russian Federation. The main hypothesis of this case is the claim that actions of Polish authorities in this regard from March 2022 to October 2023 remain insufficient, which in the event of a sudden suspension of trade in this raw material originating from the Russian Federation may result in a significant disruption of market to the detriment of economy and consumers. The article consists of three parts. First were informs about the development of LPG market in Poland before February 24, 2022. They are showing position of Russian Federation as a key importer to the domestic market. It shows which of Polish governments at that time, through support or passivity, led to consolidation of the Russian

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monopoly of supplies on Polish LPG market. The second part of article characterizes the approach of Polish authorities to diversification of directions of supplies of this fuel between February 2022 and October 2023. The third part refers to a possible scenario of limiting supplies of this fuel from Russian Federation as a result of it being subject to EU sanctions or a unilateral decision by the Kremlin in this matter. In this case, theoretical and practical analyzes based on literature, official government announcements, statistical data and media reports were helpful in obtaining an answer to question posed in the title of the article about safe operation of the Polish liquefied petroleum gas (LPG) market.

Development of the LPG market in Poland before the aggression of the Russian Federation against Ukraine

The history of development of the LPG market in Poland dates back to early 1970s. Although the technology of liquefying and using this fuel in transport dates back to the beginning of the 20th century. In the 1980s in Poland this type of power supply, especially in road transport, was considered a technical novelty. First adaptation to fuel a passenger car with LPG in Poland was made in 1974 by Zbigniew Domański [Złoty 2018]. However, the growth of LPG market in Poland occurred only as a result of mass application of this solution, which from a legal point of view became possible only in the summer of 1991, when the Minister of Transport and Water Management issued appropriate regulations enabling the installation of LPG installations in passenger cars [Zgodziński 2012: 3].

The end of 1990s created optimal conditions for wider use of LPG in road transport and economy. This trend was stimulated by increasing number of passenger cars and rising prices of traditional fuels as gasoline and diesel oil. For them, LPG was becoming a natural and cheaper substitute. The dynamic increase in demand for LPG in economy was then inextricably linked to import of this fuel into the country due to insufficient development of domestic production. The pace of market growth just before Poland's accession to the EU is evidenced by fact that in 2004, consumption of this fuel increased by 19% to the previous year. Already then trend was consolidated, in which per 2.1 million tons of LPG consumed in 2004 only 13% was covered by domestic production [Szurlej 2005: 443]. Already then 616 thousand tons of this product came to Poland from Russian Federation [POGP 2005: 19].

Since Poland's accession to EU, the growth dynamics of LPG market has clearly lost momentum and stabilized market within a small band of annual fluctuations. In 2005, the demand reported reached 2.43 million tons [Liszek 2012: 12], and at the end of 2009 it dropped to 2.31 million tons [POGP 2010: 13]. However, a disturbing phenomenon was increasing import of LPG from the Russian Federation, which was supposed to be consistent with then ongoing trend of tightening Polish-Russian cooperation. Its expression included visit of Polish Minister of Foreign Affairs Radosław Sikorski to Moscow, and visit of Prime Minister Donald Tusk to this country [Stolarczyk 2013: 55].

In 2008, LPG imports to Poland from Russian Federation satisfied 28.0% (534 thousand tonnes) of domestic consumption. Year later it was 48.8% (923 thousand tonnes) [POGP 2010: 7]. The next few years will see imports from Russian Federation further strengthen on LPG market in Poland. It achieved a particularly strong position in years 2012–2020, as presented in table 1.

Table 1: Participation of Russian Federation in LPG imports to Poland in 2011–2021

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Market share (%)	49,4	59,3	53,6	50,2	52,9	59,0	70,3	74,5	73,5	65,2	58,2
In thousands tone	895	1047	1025	945	998	1198	1660	1711	1719	1330	1257

Source: POGP 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022.

The data in table 1 show that during eleven years covering the last term of office of Platforma Obywatelska and the Polskie Stronnictwo Ludowe (PO-PSL) and the two terms of Prawo i Sprawiedliwość (PiS), the hegemony of Russian Federation as an importer of LPG to Poland was undisputed. Moreover, the data contradict hypothesis that it was during the PO-PSL government that role of this supplier posed the greatest threat from point of view of country's energy security. It was during PiS's first term of office that degree of dependence of the Polish market on LPG imports from the Russian Federation reached its maximum. A particularly high result was achieved in 2018, when almost ¾ of this fuel came to Poland from Russia. All this despite President Lech Kaczyński's critical position towards rebirth of Russian imperialism expressed back in 2008.

The lesson of Russian militarism and aggressive policy presented by Vladimir Putin in 2014 towards Ukraine through annexation of Crimea was also not reflected in desire for greater diversification of LPG supplies, including other directions and countries. Yes, one can argue that the government has no real influence on activities of commercial importers of this raw material, but shaping trade policy and its barriers, as well as energy policy, remains the domain of the central authorities and parliament, which after 2015 was dominated by PiS. Therefore, it is difficult to understand the consent at that time for such a wide commercial import of LPG from this direction. It was only in 2020 or 2021 actually, when the difficult migration situation on the Polish-Belarusian border, undoubtedly inspired by the Kremlin, began that changes on the market of LPG gas importers to Poland began.

Aggression of the Russian Federation against Ukraine and the LPG market in Poland – political declarations and actual actions

The threat of further monopolization of LPG market in Poland by imports from Russian Federation was noticed only in summer of 2021, when it had already started mass concentration of troops as part of the "Zapad 2021" maneuvers [Kasprzycki 2022: 92].

Russian intentions, going beyond ordinary military exercises, were already confirmed by satellite data. [Buynan, Lewis 2022]. The tense situation at turn of 2021/2022 made us wonder whether, despite analysts' assurances about organic risk of the tense political situation escalating to level of an armed conflict, it would actually not happen. Hence, perhaps, some Polish commercial importers of LPG to Poland and search for new contractors in event of disruption of current supply chains from the East. Nevertheless, the Russian air and missile strike against targets in Ukraine on the morning of February 24, 2022 was a shock for the entire international community [Kasprzycki 2022: 92].

It was also a shock for the Polish authorities. On one hand, they presented a firm position on broadest possible sanctions against the Russian Federation in the natural gas, LNG, crude oil and financial sectors, on the other hand, with their passivity on the LPG market, they created a dangerous situation in which the Russian decision to suspend deliveries of this fuel to Poland could cause complete paralysis of this market overnight. The Kremlin's action to terminate contracts for LPG supplies to Poland was not impossible at that time, especially in the situation of the Polish government's decisive appearances at the EU forum in favor of the greatest possible scope of EU sanctions on Russian Federation introduced in the first 6 packages between February 23 and June 3, 2022. It is worth adding that common positions on sanctions against Russia negotiated by EU leaders at that time included, among others:

- restrictions on the Donetsk and Luhansk oblasts not controlled by the government in Kiev [*EU adopts package of sanctions…* 2022]
- sale, supply, transfer and export to Russia by countries of certain goods and technologies for oil refining [*Russian military aggression…* 2022b]
- transactions with the Russian central bank [*EU adopts new set…* 2022] and exclusion of 7 Russian banks from the SWIFT system [*Russia's military aggression…* 2022a].
- new investments in the Russian energy sector and restrictions on trade in steel, iron and luxury goods [*Russia's military aggression…* 2022c].
- imports of Russian coal and other solid fossil fuels, as well as wood, cement, seafood and alcohol [*EU adopts fifth round…* 2022].
- import of Russian crude oil and petroleum products and exclusion of another 3 Russian banks from the SWIFT system [*Russia's military aggression…* 2022c].

The withdrawal of energy raw materials imported from the Russian Federation from the Polish market from February 2022, emphasized by Polish authorities, focused mainly on the issues of coal, oil and natural gas. Already on March 30, 2022, the Minister of Climate and Environment, Anna Moskwa, emphasized during her visit to Mościska that:

> Energy sovereignty is our priority, which is why we are definitely accelerating our departure from hydrocarbons from Russia. This is an effort that we must make, not only in solidarity with Ukraine, but also to strengthen our energy security. [*Minister Anna Moskwa…* 2022].

Prime Minister Mateusz Morawiecki echoed her then, stating:

> Today we are presenting the most radical plan in Europe to phase out Russian hydrocarbons – Russian oil, Russian gas and Russian coal. While others in Europe looked at Russia as a business partner, we knew that Russia primarily used gas as a blackmail tool. That's why we've been arguing for years to take away Putin's and Russia's blackmail tools. [*Minister Anna Moskwa…* 2022].

However, one of the still existing blackmail tools, which are the possibility for Russian Federation to interrupt LPG supplies to Poland, was ignored at that time. Although the value of LNG market remains much lower than that of other fossil fuels and hydrocarbons, in this confrontation Poland is a country much more exposed to the consequences of Russian actions than Western European countries. The total revenues of the Russian Federation from LNG exports to Western European countries in 2022 amounted to EUR 1.1 billion, of which as much as EUR 710.3 million went to Russian suppliers from Poland [*Kraje UE, w tym Polska…* 2023].

This constitutes 64.5% of the country's revenues from LNG imports to the West. Given the fact that in February 2023, the Kremlin's revenues from sale of oil and natural gas amounted to USD 551 million per day, the loss of annual revenues from the sale of LPG to Poland would not significantly change situation of the Russian budget [*Rosja wciąż zarabia krocie…* 2023]. It was all more worth taking a realistic look at scenario of using LPG as a tool to destabilize not only energy market in Poland, but also political influence. Meanwhile, the issue of diversifying sources of LPG supplies to Poland or even abandoning the Russian direction of supplies of this fuel to the country has not been resolved yet. Back in April 2022, Prime Minister Mateusz Morawiecki said:

> We are giving up LPG by the end of the year, we are preparing infrastructure and import directions so that there will be no imports from Russia. Poland has presented the most radical plan to abandon Russian hydrocarbons: oil, gas and coal. [Ceglarz 2022].

As it turns out, the transition from declaration level to actual diversification of LPG supplies to market turns out to be a much more difficult challenge than initially thought, and with a much greater risk of market losing stability due to a possible cut off of supplies. At the end of 2022, Russian Federation was still dominant destination for LPG imports. This is presented in table 2.

Table 2. Main directions of LPG imports to Poland in 2022

Country	Russia	Sweden	Kazakhstan	Lithuania	United States	Other
Import (thousands tons)	1161	747	109	83	69	-
Share in imports (%)	47,1	30,3	4,3	3,4	2,8	12,1

Source: POGP 2023: 7.

The data in table 2 indicate that although it was possible to reduce the share of LPG imports from Russian Federation by 11.1% in 2022, the position of this trading partner was still dominant on market. This even implies the statement that head of government's declarations about chances of fully abandoning Russian supply direction by the end of 2022 were unfeasible, taking into account both the high level of connection with this supplier and necessary investment outlays related to transformation of infrastructure and reconstruction of logistic chains aimed at other partners.

The continued lack of an EU embargo on import of this fuel [Ciszak 2023] and costs of obtaining LPG from Russian Federation, which are almost 1/6 lower than from alternative directions, contributed to the implementation of Prime Minister's declaration, which in fact still gives higher profits to importers in form of margins. [POGP 2023b]. Despite attempts to diversify directions of LPG imports to Poland, both factors, including undoubtedly the free market mechanism, had a strong impact on structure of imports. It took shape in first half of 2023 as presented in table 3.

Table 3. Main directions of LPG imports to Poland in 2022

Country	Russia	Sweden	Netherlands	Great Britain	Kazakhstan	Other
Share in imports (%)	50,1	22,0	4,6	4,6	4,5	14,2

Source: POGP 2023b.

The data in table 3 show the failure to eliminate Russian direction as a source of supply of LPG to Polish market even by end of 2023. This is not possible due to the government's lack of willingness to undertake legislative changes similar to those initiated in the spring of 2022. What is worth mentioning is that a draft of sanctions on import of Russian LPG to Poland was also submitted in April 2023 by opposition. As one of them – Andrzej Szejna – said then in the context of the previously mentioned declarations of the head of government:

> […] we are still dependent on liquid LPG from Russia in this respect, and more importantly, we paid approximately PLN 3 billion for it last year. This means that we have given Russia the opportunity for PLN 3 billion to buy tanks, missiles, flamethrowers and other types of weapons that they use in the war against Ukraine. [Roś 2023].

However, the decision not to take action on project seemed justified at the time, especially if the processes of preparing the warehouse and logistics infrastructure had not actually been completed since the definitive change of suppliers to the market.

LPG market in Poland in the situation of suspension of supplies from the Russian Federation

The lack of discussion on the parliamentary bill of April 2023 regarding sanctions on LPG from Russian Federation is, in fact, the second attempt to avoid an uncomfortable topic. This proposal was already made as part of Senate amendments to the act passed on April 13, 2022. The government did not turn out to be willing to introduce an embargo at the national level, waiting for specific solutions at EU level. However, it is in no hurry to introduce them [Bojanowicz 2023]. The time of indecision is slowly coming to an end. On November 15, 2023, European Commission (EC) presented a draft of twelfth package of sanctions against Russia, including a proposed ban on the import of liquefied propane (LPG) [Jakóbik 2023].

Therefore, a legitimate question arises about consequences and the degree of preparation of Polish infrastructure for suspension of supplies from Russian Federation and possible consequences for the stability of the domestic market and consumers. In this case, it is based on several issues. The first is undoubtedly logistics and warehousing infrastructure. It is currently strongly integrated with eastern direction of supplies. This is especially true of tanker transshipment terminals, as most of the gas from this direction reaches us by rail. The remaining parts of logistics chain are no less important. Rebuilding supply chains or warehouse infrastructure overnight is essentially impossible. Importers and intermediaries themselves certainly understand this. However, it is unknown how many of them have already started looking for new suppliers, business partners, initialing initial supply contracts, etc.

It is also difficult to determine precisely what government investments were made over the last two years to improve distribution security in the field of LPG. Information on this matter is relatively scarce. Another issue is the price of the raw material. Since Russian LPG was, in fact, the cheapest fuel to import and one providing the highest margin profits, this is why it has largely achieved a dominant position on the market. In the event of a possible suspension of deliveries from Russian Federation, a change of contractors by importers, reconstruction of supply chains or desire to maintain turnover margins at the current level with a higher price of imported raw materials may result in an increase in prices in wholesale and retail trade. This is a typical effect of changing a supplier, especially if it involves the costs of rebuilding the logistics chain, time and method of delivery, distance and price of raw materials.

The third problem concerns the state of warehouse reserves and their correlation with the time of switching to new suppliers on part of importers. If this relationship is not properly managed, there may be problems with the supply of LPG in some locations, which in turn will affect the price. All the more so, before the december summit of EU countries, at which the provisions regarding sanctions on the import of Russian LPG to EU countries will be decided, it seems necessary to carry out a thorough audit of the state of preparations for the implementation of this idea in Poland from January 2024, or negotiations of the transition period in connection with the sale the major impact of sanctions on our energy security, especially with regard to transport.

Conclusions

The issue of energy security of Polish LPG gas market in the context of ongoing aggression of Russian Federation against Ukraine is not as strongly discussed in Polish public space as the issues of natural gas, nuclear energy or energy transformation.

As a result, it is often marginalized. Meanwhile, the analysis presented in article shows that it should not be ignored. The Polish LPG market is important from the point of view of meeting the transport needs of households and enterprises. Therefore, ensuring security of supplies and diversification of directions should be an equally important task for public authorities. The collapse of this market as a result of suspension of supplies by one of contractors will be immediately felt by consumers, especially those who chose LPG due to modest income opportunities.

The analysis of the safety status of this plaster made in the article leads to several important conclusions. Firstly, for nearly 20 years there has been a lack of a fundamental and effectively implemented concept by public authorities aimed at diversifying LPG supplies to Poland and eliminating the hegemony of importing this fuel from Russian Federation. Secondly, a real collapse of LPG market in Poland is highly probable, especially if the last two years of experience related to the outbreak of conflict in Ukraine were not used by importers for activities related to construction of new logistic variants and concluding trade agreements. Of course, retail consumers and importers themselves may lose out, especially if the twelfth package of sanctions against Russia enters into force for all EU members from January 2024. Thirdly, a gradual move away from eastern markets should be considered when servicing Polish demand for LPG, and we should be more willing to look towards expanding the fleet of gas carriers or marine terminals. Since we are able to effectively use this direction and tools to import liquefied gas (LNG), this solution can be used for LPG purposes. A gateway to the development of this type of diversification may be an increasingly stronger strategic partnership with the United States, the largest producer of this raw material in the world. Orlen S.A.'s cooperation with Saudi-Aramco may also be valuable as an entity providing access to the market of Saudi Arabia, the third global producer of LPG.

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Problems of functioning Polish LPG gas market in the context of the ongoing aggression of the Russian Federation against Ukraine

Abstract

The LPG market in Poland is one of the largest in the European Union. It is also the most developing market for liquid fuels in the country, which is the result of both attractive prices of this fuel for retail consumers and the growing base of applications of this raw material in other areas of the economy. However, the security of LPG supplies to the Polish market has been changed by the Russian Federation's aggression against Ukraine, which began in February 2022. The article looks at this problem, trying to assess whether the actions taken by the government in this area have secured the Polish LPG market sufficiently against a possible suspension of LPG imports from the Russian Federation. The main hypothesis of the work in this case is the claim that the actions of the Polish authorities in this regard from March 2022 to October 2023 remain insufficient, which in the event of a sudden suspension of trade in this raw material originating from the Russian Federation may result in a significant disruption of the market to the detriment of the economy and consumers. The article consists of three parts. The first one informs about the development of the LPG market in Poland before February 24, 2022. Second part of the article characterizes the approach of the Polish authorities to the diversification of the directions of supplies of this fuel between February 2022 and October 2023. Third part refers to a possible scenario of limiting the supplies of this fuel from the Russian Federation as a result of it being subject to EU sanctions or a unilateral decision by the Kremlin in this matter. In this case, theoretical and practical analyzes based on literature, official government announcements, statistical data and media reports were helpful in obtaining an answer to the question posed in the title of the work about the safe operation of the Polish liquefied petroleum gas (LPG) market.

Keywords: diversification of supplies, economic sanctions, energy security, LPG market, war in Ukraine