Analysis of the European Union's Energy Dependence on the Russian Federation. The European Resilience in Gas Supply in the Context of Russian-Ukrainian Tensions

Ioan-Cătălin Murărașu

Abstract The military conflict between Ukraine and the Russian Federation requires a prompt and balanced response from the European Union, which must support Kiev's Western course, but also has to manage its energy industry's dependence on Russian natural gas. A Munich syndrome in Brussels' foreign policy would be a real failure, just as a set of uninspired or inefficient economic sanctions would cause irreparable losses for the Member States. The main objective of the article is to analyze the evolution of the European Union's dependence (EU-27, after BREXIT) on the natural gas delivered by the Russian Federation during 2000–2021 period. The study will identify the causes that made it impossible to reduce this dependence and will formulate opinions on the factors that have affected Europe's energy security over the last two decades. EViews12 (Hodrick-Prescott filter) and PSPPIRE (Pearson correlation coefficient) software were used in the research. The results of the research show an upward trend in the European Union's dependence on Russian gas imports, mainly due to the year-on-year decline in the Member States' domestic production. The assessment indicates a medium-term continuation of the evolution presented, but the inclusion of investments in the gas sector in the European taxonomy on sustainable financing can relaunch the domestic upstream sector, reversing this trend.

Keywords Energy security · Natural gas · European Union · Russian Federation · Energy dependence

1 Introduction

As the dissolution of the Soviet Union marked the end of the last century, the annexation of the Crimean Peninsula by the Russian Federation, twenty years after the signing of the Budapest Memorandum (1994), annoyed the public opinion by raising questions about the capacity of international alliances to continue to maintain the

I.-C. Murărașu (✉)
Bucharest University Of Economic Studies, Bucharest, Romania
e-mail: murarasu.catalin9@gmail.com

Piata Romana 6, Sector 1, 010374 Bucharest, Romania

M. Busu (ed.), *Digital Economy and the Green Revolution*, Springer Proceedings in Business and Economics, https://doi.org/10.1007/978-3-031-19886-1_14

security in Europe. Even if the violation of Ukraine's territorial integrity—even by the state that has pledged to respect the integrity of its borders in exchange for renouncing its nuclear power claims—discredits the foreign policy of the Russian Federation, Moscow seems willing to take on these image losses again.

Still seemingly guided by the old Heartland Theory (Mckinder 2020), Russia manifests its revisionist interests once again, threatening the stability and the security of some of the states that were part of the comprehensive Soviet Union. Although the Kremlin's efforts to keep its old sphere of influence intact may throw Europe into a new era of the Iron Curtain, Russian leaders are not willing to give in to the West. Moreover, they express their intention to block, at any cost, the attempts of the former Soviet states to turn their eyes to the West.

If in the last century Moscow has claimed the status of the world's leading military power, the resounding failure of the Soviet strategy has forced Russian leaders to identify other methods to control the neighboring states—less expensive but certainly just as effective and, perhaps, even profitable. Thus, since the 1990s, the Russian Federation has speculated on the economic benefits of its impressive territorial size, which provides access to the natural resources that both Europe and Asia need (Tompson 2005).

In the century of technology and speed, Moscow benefits from the most important weapon—energy—which is the basis of every economic sector and cleverly combines it with its military power. Thus, the Kremlin administration uses the power position of the Russian Federation as an exporter of energy resources, especially natural gas, both as a "lasso" for the states that want to get out of its sphere of influence, and as a weapon against those who challenge its regional supremacy.

The purpose of this article is to analyze the evolution of the European Union's dependence (EU-27, after BREXIT) on natural gas delivered by the Russian Federation in the period 2000–2021—a stage marked by Moscow's hostilities against Ukraine. The article also aims to assess the capacity of the European Community to compensate the abandonment of imports from its main energy supplier in the context of the new tensions in the Eastern Neighborhood.

The data used for the study are provided by Eurostat and Enerdata. The Hodrick-Prescott filter was used to determine the trends required for the analysis, using the EViews12 software. The PSPPIRE program was used to calculate the Pearson correlation coefficient between domestic EU gas production and the imports of Russian origin. In addition, the "TREND" function, available in Microsoft Excel, was used to forecast the EU-27's consumption, production of natural gas and its dependence on Russian imports in the period 2022–2024.

The increase in the European Union's dependence on natural gas imports is mainly rooted in the significant decrease of the production of the Member States. This situation was created both by the entry into a period of revitalization (Mihalache 2016) for some of the European fields that were exploited for decades, and by the European environmental policies, which discourage the investment in the energy production from conventional sources, including those based on natural gas.

However, a major shift in the European Commission's perception of this industry can be seen in early 2022 by including the investment in the gas sector in the European

Union Sustainable Finance Taxonomy (European Commission 2022). This change could revitalize the domestic upstream segment and reduce Member States' dependence on imports. Another factor that could contribute to the reversing of the upward trend in gas supplies from the Russian Federation to Europe is the completion of the Trans Anatolian Natural Gas Pipeline project, through which Azerbaijan, that has a growing production, can export natural gas to the West (Agayev 2021).

As the COVID-19 pandemic has exposed all the vulnerabilities of the European medical system, a crisis situation such as an open military conflict in the Eastern Europe would highlight all the vulnerabilities of the contemporary European architecture, from lack of unity in foreign policy decisions to its very low self-defense capacity. Regarding to the energy sector, the most acute shortcomings are created by the rapidity with which Europeans have abandoned the conventional technologies, correlated with the too slow speed of their replacement with the green ones.

2 Literature Review

The current security context flagrantly illustrates that the transition from totalitarianism to democracy of the most states that were part of the former USSR is not complete yet. To the same extent, the recent evolution of the territorial disputes in Ukraine shows the impossibility of the former Soviet states to decide their international course on their own. Ekiert (2010) considers that the role of the international factors in the transition of the former Soviet republics to democracy is much more important than for those who have chosen this path before the fall of the USSR. In the case of Eastern Europe, these factors decisively shaped the stages of the former communist countries' transition, from the change of regime to the consolidation of the new state.

In the case of Ukraine, the easing of territorial disputes with the Russian Federation is being discussed internationally, often without the involvement of the Kiev authorities. Against this context, the Kiev state is engaged in a military conflict whose settlement depends the most on bilateral negotiations between Western leaders and the Kremlin administration, which has a strong advantage because of the European countries' vulnerability to Russia's energy "weapon" (Ellyatt 2021).

Kagan et al. (2021, pp. 12–13) argue that, in addition to blocking Ukraine's aspirations to become a NATO member, one of Russia's interests in the created military crisis is to restore the former Soviet Union's spheres of influence. Russians often demonstrated after 1991 that they intended to control the domestic and foreign policy of the former Soviet countries. However, the latest developments—the largest military invasion in Europe since World War II—show that the Kremlin administration even wants to occupy Ukraine militarily, not just to control it politically and administratively.

This point of view is also acknowledged by Adomeit (2007) who argued, even before the Crimean crisis, that the Kremlin's declarative adherence to Western values

did not imply their implementation and the Russian Federation's deviation from the Western European principles is an important destabilizing factor.

Until now, the Russian Federation has successfully used its advantage as the main energy exporter in Europe, managing to establish a whole network of supply contracts, usually non-transparent, with European states and companies. The inability of the former Soviet countries to identify new sources and routes of energy supply has helped Moscow to maintain its sphere of influence, blocking the westernization of Eastern Europe (Proedrou 2018).

Although the occupation of the Crimean Peninsula by the Russian Federation has raised questions about the reliability of Gazprom's transport routes—whether or not they transit Ukraine (Luciani 2016)—European states have failed to counterbalance their dependence on Russian imports either through their domestic production or by identifying new sources in countries with less revisionist regimes.

Moreover, the "perfect storm" in the energy market (Asthana 2021) has increased the Russian Federation's ability to use its energy leverage in its relations with Europe and makes it impossible for the Kiev authorities to negotiate with Moscow for a solution in the military and diplomatic conflict. The crisis in Ukraine faithfully illustrates that there is a close link between geopolitics and energy, and the access to natural resources is a key factor in winning a war, whether it is military or otherwise (Pascual 2015).

As in the last decade of the last century, the Baltic republics, proclaiming their independence, faced military repressions and, also, economic and energy constraints imposed by Moscow to block their western course (Kahn 2008, p. 89), Ukraine is threatened by the successor of the Soviet Union, which is guided by the same imperialist visions as its predecessor. Liuhto (2010, p. 42) argues that energy business often has geopolitical goals. Also, the exporting status of the Russian Federation provides to Kremlin an important weapon which could be used at any time, with serious consequences for importing states, but without legal consequences for Russians.

Thereby, Moscow has the control over the energy component in a hybrid war started since the last century, the end of which is not visible (Ruhle and Grubliauskas 2015). The indebtedness of Eastern European states for the purchase of Russian natural gas and the impossibility to identify new sources of supply maintain the influence of the Russian Federation in Eastern Europe and diminish the capacity of the European Union and NATO to co-opt new members. As for Ukraine, it has not yet been able to combat the dependence on Russian energy imports, even if this has been a strategic commitment since 2015 (Mara et al. 2022).

Another point of view supported by experts is that the Russian Federation is also equally dependent on the European market because most of the energy and raw materials produced are destined for exports to this region. Thus, both parties have an interest in maintaining reciprocal trade (Jääskeläinen et al. 2018). Whether if it is true or not, given that the EU's domestic natural gas production is declining faster than the Brussels authorities have estimated (Pashkovskaya 2019), the balance of interdependence between Member States and the Russian Federation is tilting in favor of Kremlin.

In the context of the conflict between Kiev and Moscow, the European Union and the United States have naturally chosen to support Ukraine, primarily financially and humanitarian, whereas military aid is impossible to grant without violating the international treaties and creating a military conflict with Russia (Masters 2021). They have also threatened the Russian Federation with economic sanctions, but the effects of the Western soft power strategy do not seem to be enough to prevent the escalation of the conflict. Moreover, European states could face a new energy crisis—which would be difficult to manage—in the event of a possible blockade of imports of Russian energy raw materials (Ambrose 2022).

3 Methodology

In order to predict the direction in which the annual production and consumption of natural gas in the European Community will evolve in the period 2022–2024, we will use the linear function "TREND" in Microsoft Excel, based on the available data from the period 2000–2021. The same method will be used to identify the direction of evolution of the dependence on Russian natural gas in the next 3 years. Subsequently, we will apply the Hodrick-Prescott filter to establish the trend of natural gas imports from the Russian Federation and the dependence of the Community space on this source.

To analyze the link between the evolution of the domestic production of the EU-27 and that of Russian imports, we will calculate the Pearson correlation coefficient between the two variables, using the PSPPIRE software.

Furthermore, to test the hypothesis that the Russian Federation's natural gas production is dependent on deliveries to the European Community, we will calculate the percentage of Russian exports to the EU-27 of total annual production in the period 2000–2021 and we will analyze its evolution. The author should make references to some previous research similar to the present one, if that is the case. Also, the author should mention the software programs used for processing statistical data if it is the case.

The calculation formula used by EViews 12 to apply the Hodrick-Prescott filter is:

$$\sum_{t=1}^{T}(y_t - s_t)^2 + \lambda \sum_{t=2}^{T-1}[(s_{t+1} - s_t) - (s_t - s_{t-1})]^2$$

where: y_t represents the initial series, s_t represents the trend, and λ represents the value that adjusts the deviations from the trend (its value is 100).

RF's dependence on the EU-27 market is calculated according to the formula:

$$\frac{L_{EU}}{P_{RF}}\%$$

,

Where: L_{EU} represents the annual natural gas deliveries to the EU-27, and the P_{RF} represents the total production of Russian gas in one year.

4 Results and Discussions

Both consumption and production of natural gas in the European Community are on a downward trend, one of the main reasons being the EU's policy on combating climate changes and promoting renewable energy sources, which has diminished the attractiveness of investments in natural gas-fired power capacities. However, both current trends could be reversed as a result of the European Commission's decision to include the investments in production facilities that use this raw material among sustainable ones (see Fig. 1).

Although the amount of natural gas imported by EU-27 countries from other sources than Russian Federation has slightly increased since 2000, the dependence on Russian natural gas has also increased since 2010. This situation is mainly due to the continuous decrease in the domestic production of European countries, reduced from 24% of consumption in 2015 to 9% in 2021 (see Fig. 1) (Fig. 2).

The amount of natural gas imported by the EU-27 from the Russian Federation is not fully consumed by the Member States, some of which is traded by European suppliers in other non-EU countries, such as Serbia, Switzerland, or the United Kingdom, which use EU transmission infrastructure for the supply with Russian

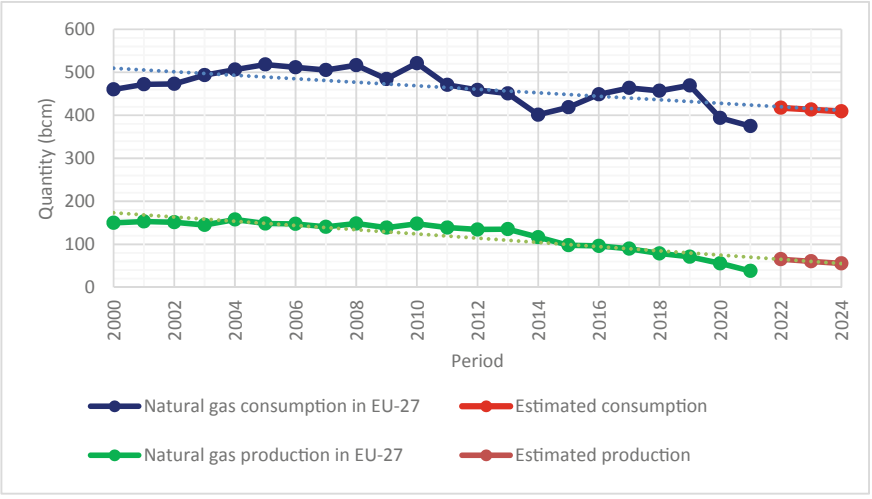

Fig. 1 The natural gas consumption and production in EU-27 (*source of data* www.ec.europa.eu, www.bruegel.org, www.statista.org)

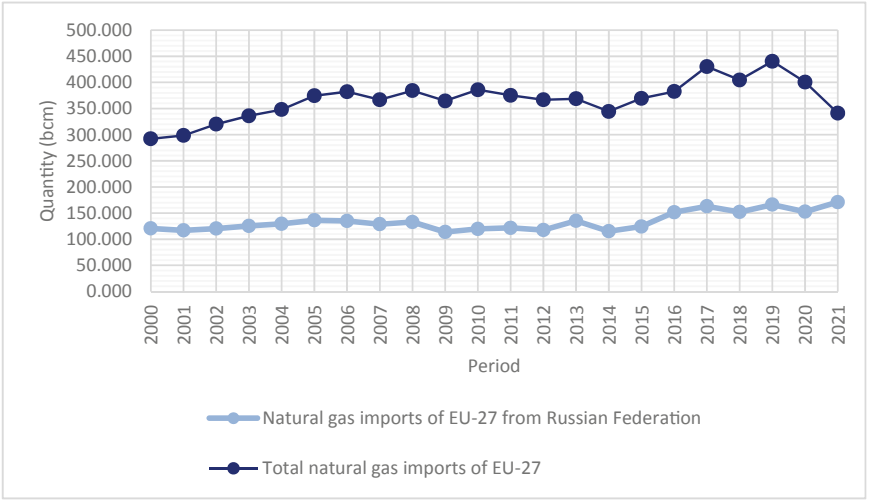

Fig. 2 Natural gas imports in EU-27 (*source of data* www.ec.europa.eu, www.bruegel.org)

gas. It can also be used to balance the national transmission systems. Thus, even if not all the imported quantity is consumed in the Community, the companies in the supply and transport segments and, implicitly, the European countries receive considerable revenues as a result of the transit of gas on their territory.

Using the EViews12 software to apply the Hodrick-Prescott filter, we identify an upward trend in imports of Russian origin in the period 2000–2021, and since 2010 we have seen an acceleration of it, to which the reduction of domestic production of European countries has mainly contributed to (see Fig. 3).

Fig. 3 Hodrick-Prescott filter (lambda = 100) for the natural gas imported from Russian Federation between 2000 and 2021 (*source of data* www.ec.europa.eu, www.bruegel.org)

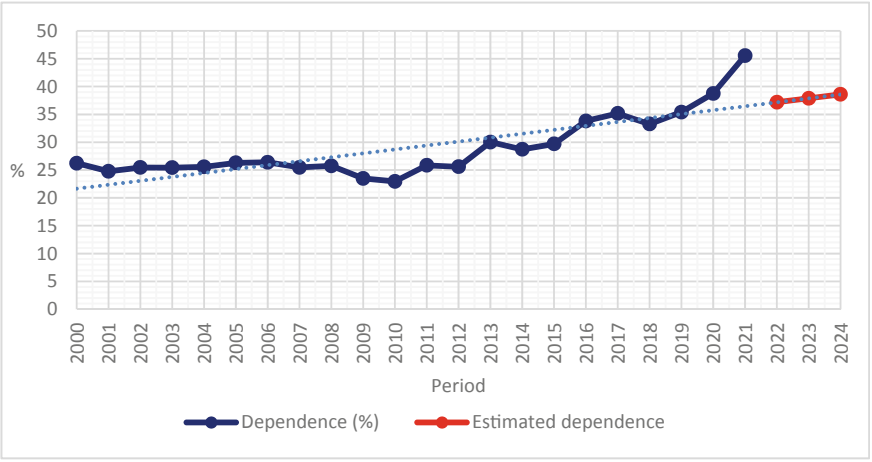

Fig. 4 EU-27 dependence on Russian gas imports

The decline in domestic production of European states, as a result of declining productivity and even the closure of some deposits, already exploited for decades, have led to a gradual increase in dependence on Russian imports. The inability to identify enough new sources of supply has made it difficult to reverse this trend (McWilliams et al. 2022).

During the period under review, the natural gas supplies from the Russian Federation to EU-27, as a percentage of its production, were steady, representing on average 20.5% of annual Russian production. However, their share of EU-27 consumption has followed a growing trend, accelerating since 2019, even if the European leaders have been aiming to diversify their import sources and reduce their dependence on Russian supplies since 2009 (see Table 1) (Fig. 4).

Using the EViews12 software to apply the Hodrick-Prescott filter it has been identified an upward trend in dependence on Russian gas, similar to that of imports from this state. The result could indicate an inability of the EU-27 to find new sources of supply fast enough to offset the declining domestic production (see Fig. 5).

Using the PSPPIRE program to establish the link between EU-27 production and Russian imports, it revealed a strongly negative Pearson correlation coefficient (−0.81) between the two variables. The results indicates that Member States had to compensate for the decrease in their natural gas production by increasing imports. In the context in which they did not identify enough alternative sources of supply to the Russian Federation, the operators in the supply segment turned to Russian producers to supplement their demand (see Fig. 6).

The graph in Fig. 7 illustrates the fluctuations in the supply of natural gas to European countries depending on the time of year and also its cyclicality. The sinusoidal structure is given by the increase of the consumption demand in the cold season and its decrease in the warm season and also due to the recovery of the production of electricity from renewable sources after the end of winter. Under these conditions,

Table 1 Dependence of Russian Federation (RF) natural gas production on the EU-27 market (*source of data* www.ec.europa.eu, www.enerdata.net)

Reference year	RF natural gas production (bcm)	RF natural gas deliveries to EU-27 (bcm)	RF dependency on EU market (%)
2000	573	121	21.1
2001	570	117	21.5
2002	584	120	20.6
2003	608	125	20.6
2004	620	130	21
2005	628	136	21.7
2006	640	135	21.1
2007	635	129	20.3
2008	651	133	20.4
2009	583	114	19.6
2010	657	120	18.3
2011	673	122	18.1
2012	658	118	17.9
2013	675	135	20
2014	647	115	17.8
2015	638	124	19.4
2016	644	152	23.6
2017	695	163	23.5
2018	738	152	20.6
2019	751	166	22.1
2020	705	153	21.7
2021	773	171	22.1

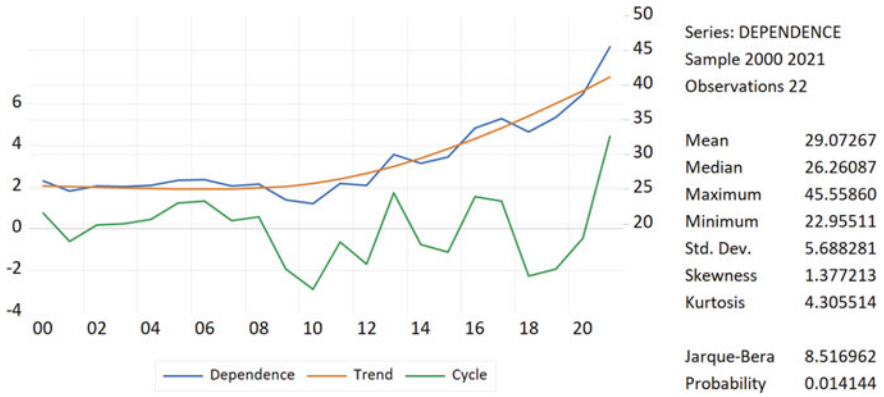

Fig. 5 Hodrick-Prescott filter (lambda = 100) for the dependence on natural gas imported from the Russian Federation in the period 2000–2021

```
CORRELATION
     /VARIABLES =  Imports_from_RF Production_EU27
     /PRINT = TWOTAIL SIG.
```

Correlations

		Imports_from_RF	Production_EU27
Imports_from_RF	Pearson Correlation	1.000	-.810
	Sig. (2-tailed)		.000
	N	22	22
Production_EU27	Pearson Correlation	-.810	1.000
	Sig. (2-tailed)	.000	
	N	22	22

Fig. 6 Pearson correlation between natural gas production in the EU-27 and imports from the Russian Federation (*source of data* www.ec.europa.eu, www.bruegel.org, www.enerdata.net)

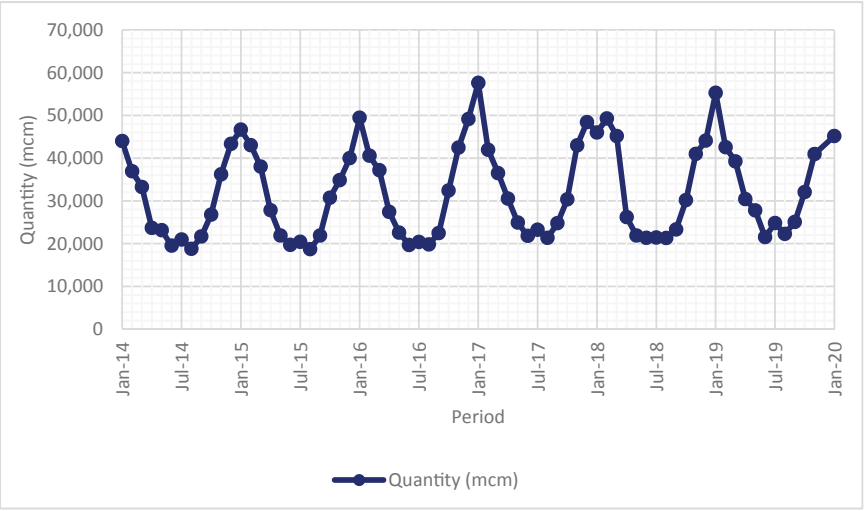

Fig. 7 Monthly evolution of gross inland natural gas delivery in the EU-27 (*source of data* www.ec.europa.eu)

we can anticipate, based on previous developments, a decrease in consumption from February and a further increase in September.

5 Conclusion

Aging of fields in the territories of the Member States and their decrease in profitability are the main factors in the decline of the natural gas production over the last ten years. The European Union's policy of discouraging investment in the gas

industry and in the fossil fuel-based electricity generation capacities has further aggravated the decline of this energy segment. Applying the Hodrick-Prescott filter to the EU-27's annual dependence on Russian gas in the period 2000–2021, we see an accelerated increase in the second half of the analyzed period. The highly negative Pearson correlation between annual natural gas production in the European Community and Russian imports also indicates a close link between them and highlights the difficulties faced by the Member States in trying to identify supply alternatives.

The Russian Federation, which has always been the main supplier of natural gas and energy in Europe, has increased its influence over the EU's energy sector year after year. Also, this power position, often used like a hybrid weapon in its wars with the states that challenge its supremacy, became more effective. This development did not increase the dependence of the Russian Federation on the gas exports to the European Union. The percentage they represent in the annual production of Russian companies has remained constant in the last two decades, due to the increase of the amount of this raw material extracted nationwide.

The trend in annual gas imports from the Russian Federation will remain a "bullish" one for the next three years, all the more so as the gas industry seems to be gaining ground in the European negotiations on financing sustainable investments. On the other hand, the financing of this energy sector by the European authorities could mean the reversal of the "bearish" trend of the European gas production, which means the most efficient alternative to Russian imports.

In case of a possible short-term cessation of Russian natural gas supplies to the European Union, the data presented in Fig. 6 suggest a lower impact of such an event during the warm season, when the consumption is declining. Thus, we can assess that Member States could overcome a crisis situation in the short term by heading for alternative sources (Norway, Libya, Azerbaijan, the existing reserves or liquefied natural gas imports), even if those are more expensive, and reducing consumption by rationalization measures. However, the blockade of imports during the cold season would make it significantly more difficult to meet consumption needs, which are at least double in December-February than in the opposite part of the year.

In the long run, the cessation of Russian natural gas supplies to the European Union would deprive the Community space of about 40% of its natural gas needs, a quantity that is difficult to completely replace. On the other hand, the Russian Federation would have to identify alternative sources of income to offset the sales of about 21% of its annual natural gas production. This deficit would be even more difficult to cover if the Russian army were to engage in a long-term war of attrition, similar to that in Chechnya, but on foreign territory and with an adversary official and unofficial supported by Western powers.

Although both sides would be severely affected by a possible blockade of natural gas flows from the Russian Federation to the West, the European Union's high dependence on Russian gas makes it much more prone to a crisis situation. Thus, for European leaders is hard to combat the Moscow's aggression against Ukraine through sanctions on natural gas imports because their effect would be more pronounced on the European states and it would not discourage Russia in the military field.

In the unstable security context of Eastern Europe, the European Union must fight against Moscow's hard power policy using soft power tools, the only ones it possesses and can be engaged in the hybrid war it is facing. Although the economic sanctions imposed by Brussels have often proved to be effective, in the case of the Russian Federation they can hardly be applied even in the area where they would have the most drastic effect, the energy one.

The European Union's inability to reduce the impact of the Russian Federation's energy weapon and to maintain the European path of the former Soviet states is caused, to a considerable extent, by the vulnerabilities created by its policy that was meant to combat climate change. Brussels, sometimes, uninspired measures have led to an increased dependence on the Russian gas and a weakening of the EU's energy sector, which has failed to keep up with the new regulations, making the conventional energy sources unprofitable without ensuring that the renewable energy sources can cover the gaps that were created.

The disruption of natural gas trade between the Russian Federation and the European Union would greatly affect both sides economically, for which reason it is not in the interest of any of them to consider the option of medium and long-term cessation. However, the extended military conflict in Ukraine, whose territory is transited by the main gas corridors between Europe and Russia, could make critical transmission infrastructure unavailable, with serious consequences for the entire continent.

References

Adomelt, H.: Inside or Outside? Russia's policies towards NATO. German Institute for International and Security Affairs (2007). https://www.swp-berlin.org/publications/products/arbeitspapiere/NATO_Oslo_ks.pdf. Last accessed 02 March 2022

Agayev, Z.: Azerbaijan Talks With New European Gas Buyers Amid Energy Crunch. Bloomberg (2021). https://www.bloomberg.com/news/articles/2021-11-03/azerbaijan-talks-with-new-european-gas-buyers-amid-energy-crunch. Last accessed 24 February 2022

Ambrose, J.: Energy crisis: where could Europe's gas come from if Russia cuts exports? The Guardian (2022). https://www.theguardian.com/business/2022/jan/27/energy-crisis-where-could-europes-gas-come-from-if-russia-cuts-exports. Last accessed 10 March 2022

Asthana, S.: A perfect storm in the energy sector. MoneyControl (2021). https://www.moneycontrol.com/news/opinion/a-perfect-storm-in-the-energy-sector-7520081.html. Last accessed 22 February 2022

Ekiert, G., Hansom, E.S.: Capitalism and democracy in Central and Eastern Europe. Polirom Publishing House, Iasi (2010)

Ellyatt, H.: The U.S. was right—Europe has become a 'hostage' to Russia over energy, analysts warn. CNBC (2021). https://www.cnbc.com/2021/10/07/europe-is-now-a-hostage-to-russia-over-energy.html. Last accessed 21 February 2022

European Commission: EU Taxonomy: Commission presents Complementary Climate Delegated Act to accelerate decarbonization (2022). https://ec.europa.eu/commission/presscorner/detail/ro/IP_22_711. Last accessed 21 February 2022

Jääskeläinen, J.J., Höysniemi, S., Syri, S., Tynkkynen, V.P.: Finland's dependence on Russian energy—mutually beneficial trade relations or an energy security threat? Sustainability **10**(10) (2018). https://www.mdpi.com/2071-1050/10/10/3445. Last accessed 22 February 2022

Kagan, F.W., Bugayova, N., Barros G., Stepanenko, K., Clark, M.: Forecast series: Putin's likely course of action in Ukraine. Institute For The Study of War (2021). https://www.understandingwar.org/sites/default/files/Ukraine%20Invasion%20Forecast%20Series%20Part%201%20ISW%20CT%20December%202021.pdf. Last accessed 22 February 2022

Kahn, S.: European Union Geopolitics. Cartier Istoric Publishing House, Bucharest (2008)

Liuhto, K.: Energy in Russia's foreign policy. Electronic Publications of Pan-European Institute (2010). https://www.researchgate.net/publication/264920963_Energy_in_Russia's_foreign_policy. Last accessed 23 February 2022

Luciani, G.: The EU and LNG as a flexible tool for energy security: constraints and opportunities. Future Nat. Gas. Markets Geopolit. (2016). https://www.iai.it/sites/default/files/iai-ocp_gas.pdf. Last accessed 23 February 2022

Mara, D., Nate S., Stavytskyy, A., Kharlamova, G.: The place of energy security in the national security. Energies **15**(2) (2022). https://www.mdpi.com/1996-1073/15/2/658. Last accessed 11 March 2022

Masters, J.: Ukraine: Conflict at the Crossroads of Europe and Russia. Council on Foreign Relations. Council on Foreign Relations (2021). https://www.cfr.org/backgrounder/ukraine-conflict-crossroads-europe-and-russia. Last accessed 02 March 2022.

Mckinder, H.J.: The Geographical Pivot of History. Cosimo Classics Publishing House, New York (2020)

McWilliams, B., Sgaravatti, G., Tagliapietra, S., Zachmann, G.: Can Europe survive painlessly without Russian gas? Bruegel Blog (2022). https://www.bruegel.org/2022/01/can-europe-survive-painlessly-without-russian-gas/. Last accessed 10 March 2022

Mihalache, S.: Contributions to the improvement of methods and technologies for the exploitation of mature deposits through horizontal wells. Petroleum-gas University of Ploiești, PhD (2016)

Pascual, C.: The new geopolitics of energy. Center of Global Energy Policy (2015). https://www.energypolicy.columbia.edu/sites/default/files/The%20New%20Geopolitics%20of%20Energy_September%202015.pdf. Last accessed 25 February 2022

Pashkovskaya, I.: The first results of the European Union's external energy policy. Espacios (2019). https://www.revistaespacios.com/a19v40n25/a19v40n25p06.pdf. Last accessed 27 February 2022

Proedrou, F.: Russian Policy and Structural Power in Europe. Taylor and Francis Online (2018). https://doi.org/10.1080/09668136.2017.1419169. Last accessed 01 March 2022

Ruhle, M., Grubliauskas, J.: Energy as a tool af hybrid warfare. Nato Res. Pap. (2015). https://www.files.ethz.ch/isn/190791/rp_113.pdf. Last accessed 04 March 2022

Tompson, W.: The political implications of Russia's resource-based economy. In: The Seventh International Council for Central and East European Studies. Berlin. (Unpublished) (2005). https://eprints.bbk.ac.uk/id/eprint/219/. Last accessed 02 March 2022