International energy trade: The EU's position and energy security[1]

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Abstract: *Increasing energy consumption and ensuring the supply of energy resources in sufficient quantities and changes in the energy mix of individual countries and regions are a pressing issue today. Besides their economic dimension, energy and energy policy also carry geopolitical and security importance. The ecological and social aspect is increasingly important; issues related to the availability of resources, stability of supply, efficiency and fuel prices are becoming more common and pressing. This study has expanded on the subject of energy dependence to include the concept of interdependence. It has also delved into international trade, incorporating this plane to provide a broad international dimension and emphasise the need to strengthen the energy security of individual states. The aim of this article is to show the gravity of the EU's unilateral Russian-dominated import focus and the possibility of reshaping the pattern of energy imports into the EU. The analysis of energy trade has drawn on an interpretation of the outputs of available data, with the caveat that the war in Ukraine has limited momentum in this area. The results of the subject explored here are presented in the form of a discourse on opportunities to redirect trade and strengthen the EU's energy security. The European Union, as a primary-energy import region, must revisit the territorial structure of its primary-energy imports, diversify its suppliers, change the energy mix and interconnect energy infrastructure by deploying new technologies.*

Keywords: ***Energy, Energy Security, Interdependence, Energy Mix, International Trade, Import Dependency***

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I. Introduction

The world economy has been plagued by numerous upheavals in recent decades. The main driver of change is global trends that affect all regions and have often been and are underestimated. Current factors include the ever-increasing global consumption of primary energy and the associated efforts to ensure a sufficient supply of energy resources and changes to the energy mixes of individual states and regions. Apart from the economic dimension, energy and energy policy also carry fundamental geopolitical and security importance. The ecological and social aspect is becoming more important; issues related to the availability of resources, stability of supply, efficiency and fuel prices are becoming more common and acute (Bauerová – Hlaváčková – Vošta 2018: 55).

Energy has historically been the driving force behind the growth of the European economy. The main pillar of economic development has always been high energy consumption. The EU is now dependent on foreign energy supplies because demand for primary energy resources significantly exceeds their production, and the EU does not have significant long-term fossil fuel reserves. It is therefore logical that energy security has become a key issue of EU economic policy. The external dimension of European energy policy is linked to the interpretation of energy security, a key phenomenon of EU economic policy.

As one of the largest energy consumers in the world, the European Union region has an energy mix that depends mainly on oil and gas, i.e. resources of which the extraction and proven reserves are minimal in the EU. The EU imports more than half its primary energy, and that import dependency continues to grow. The EU's energy security is thus very unstable; the undiversified import structure, with its dominant focus on Russia, has progressed from a risk to a critical problem. The above-mentioned aspects of the energy situation require a decisive approach to change and a more coordinated EU energy policy. National energy markets' inability to liberalise or transform their energy mixes, plus shortcomings in the implementation of investment projects in individual countries that would facilitate the diversification of risks stemming from high energy intensity, have led to the push for a common energy doctrine (Baláž – Margan – Ružeková – Zábojník 2011: 19). However, with the energy crisis beginning to escalate as a result of Russia's aggression against Ukraine, the European Union faces truly fundamental issues in the field of energy security and related energy dependence, and these require urgent solutions.

The increasingly topical issue of securing energy resources is one of the most important areas of national security and determines the nature and intensity of interdependence between states. Energy security should be based on two basic pillars. The first pillar is a stable and secure energy supply and the second pillar is a diversified structure of energy suppliers. States should be prepared to eliminate all risks that may arise. These may include depletion and disruption of the

energy supply, political instability, speculator activities, price instability, actions disrupting energy infrastructure and natural externalities (Ivančík – Kelemen 2013). One fundamental risk is undoubtedly the strong orientation of countries towards the import of energy resources; another risk dimension is the lack of diversification of resource importers or even a unilateral focus on one import region. Further factors that may trigger an energy crisis are the energy infrastructure security threat, insufficient diversification of non-energy mixes and the poor diversification of transport routes (Baláž – Zábojník – Ružeková – Svobodová 2009: 77). Energy security disruption constitutes a typical asymmetric effect. The key issue here is the position of the state in which it is located, and whether the state is an importer or an exporter of energy resources.

II. Theoretical framework

The concept of the article is grounded in a theoretical analysis of the phenomenon of international cooperation and interdependence, including international trade. Energy trade is of high importance and is placed in the context of an international perspective. The text is theoretically framed by the concept of interdependence in order to place trading in energy feedstock in an international context. The basic theoretical strands are the phenomenon of mutual cooperation and mutual economic interdependence. Realist theories regard states as exclusive players in international relations, not admitting the influence of non-state players. The state plays a vital role as the enforcer of its own existence and security for the population. A common feature of the liberal line in theories of international relations is that states are not the only entity operating in the international environment, in that this is also influenced by international organisations, multinational corporations and non-governmental organisations (Drulák 2012: 147–150). According to Dunne, liberalism in international relations is represented by three streams: institutionalism, democratic realism and economic realism. It is economic realism, which deals with international trade and economic exchange as a factor mitigating the risk of international conflict, that is associated with interdependence (Dunne – Kurki – Smith 2021: 93–98). A fundamental attribute of the liberal concept of interdependence is that interconnected states are not in conflict with each other, as this would harm both players. In this context, an attacking state would have to consider the risks associated with a disruption of their interconnectedness.

The energy sector, essential for the functioning of any state, has gradually become fully interconnected with the concept of interdependence. A basic characteristic of the territorial structure of extraction and reserves of energy resources and their consumption is their unevenness. International energy trade has thus become part of international cooperation and interdependence. For the above reasons, the imported-energy dependence, for example, of EU states is

completely logical, especially in terms of high consumption, minimal primary energy production and the inappropriate energy mix. On the other hand, in the case of exporting countries, primary energy is a determinant of economic growth and forms an essential part of state revenues. Another important factor in international energy trade is energy infrastructure, which further deepens mutual ties between states, but these very close dependencies may be exploited as a political tool (Farrell – Newman: 2019).

In the context of the international dimension, energy trade and the above-mentioned interdependence, a fundamental issue for individual states is the level of energy security, which ensures stable and continuous access to energy resources under conditions of timely and sustainable availability. Although this is one of the most important objectives of state policies, in retrospect it is notable that some states are ahead of others in tackling their reduction of energy security. Energy security needs to be extended to include energy resilience, which would enable states to react quickly to unexpected fluctuations in supply for any reason. It is necessary to arrange short-term energy security that ensures a prompt reaction, but also long-term protection, which can be achieved primarily by the timely purchase of resources from foreign entities.

The discussion on energy security has been going on for decades. Numerous modifications have been made to this concept term and a number of definitions of energy security have evolved from the 1970s to the present. At first, the development of definitions focused on the physical availability of energy resources; later, the emphasis was placed on affordability and other aspects, including political and strategic ones, were included in the definition. The International Energy Agency defines energy security as access to a sufficient amount of energy at an affordable price with respect to the environment. The development of the definition can be traced back to the 1973 oil shock, a typical example of the asymmetry of interdependence in the field of non-military political weaponry in the international environment. Yergin defined energy security as the availability of sufficient energy and energy resources at affordable prices (Yergin 2012: 512). Ivančík, for instance, defined energy security as access to an adequate amount of energy resources in an adequate form and at an adequate price (Ivančík 2012). The European Commission defined energy security in the Green Paper of 2006 as the availability of energy products on the market at affordable prices for all consumers, respecting the environment and moving towards sustainable development. The United Nations emphasises not only affordability and reliability, but also the sustainability of energy resources (United Nations 2015). However, energy security can also be understood in a broader context as the interdependence of all players – producers, importers, exporters, transit elements, national and international entities – with mutual cooperation and risk minimisation being a priority (Terem 2011).

As mentioned above, the disparity in the understanding of energy security by countries – importers and exporters of energy feedstock – is crucial. A specific dimension is added by transit countries, which can also play a key role. Here we can see the intersection of exporters, importers and transit countries, where the importance of interdependence is different for each participant in energy trade. Therefore, differences in the definition of energy security by country of origin can also be found in the understanding of the concept of energy security. However, with some generalisation, it can be stated that the main factors that appear in the definitions and that are essential to maintaining energy security are: the provision and security of supply, especially primary-energy resources and electricity, continuity and regularity of supply, sufficient supply, affordable supply prices and sustainable production and transport (Ivančík – Kelemen 2013). The four basic attributes according to Yergin offer an even broader context for understanding energy security. The first attribute is the diversification of energy feedstock supplies; diversification of suppliers, alongside the diversification of supplies, is emphasised here. The diversification of transport, including infrastructure, seems to be crucial. Another key factor is the elasticity of energy flows; it is crucial to be able to react quickly to shocks caused by supply disruptions with adequate capacity in production, reserves and transport. The third attribute is the existence of a global market, and its stability in relation to the security of its participants. The last important aspect is reliable information enabling the proper functioning of the market, changing responses and procedures (Yergin 2006).

In the context of energy security, it is also necessary to note the importance of the composition of each country's energy mix. First of all, this concerns a suitable mix in terms of the share of individual primary-energy resources in energy consumption. Primary resources are converted into specific energy carriers. Energy security includes the capacity of the energy infrastructure. Here, it is necessary to take into account the corresponding processing capacity when changing the energy mix (Pascual – Elkind 2010: 141).

III. The EU's energy mix and energy trade

This study works with data provided by Eurostat, the statistical office of the European Union, available for 2020; available data from 2021 to the third quarter of 2022 are also considered. Due to the unavailability of data, it was not possible to provide the most up-to-date view of the current, very dramatic changes that will be the subject of future research. However, it can be assumed that after a thirty-year increase in import dependency in energy resources, the EU has reached a milestone that will bring about fundamental changes in the energy mix of countries, as well as in the territorial structure of energy suppliers. The long-term upward trend was also confirmed by the increase in

import dependency in the last decade, from 54% to 60% in 2019. The EU can be described as a net importer of energy feedstock. This situation is informed by several factors which, in combination, have a very negative effect. The EU is a high-consuming region; due to the uneven distribution of energy resources in the world, Europe is very under-equipped and its policy focus aimed at reducing the use of non-renewable energy sources in particular (Costantini – Morando – Olk – Tausch 2022) also plays an important role. In the context of the current war in Ukraine and the changing EU-Russia relations, a change in the energy mix can also be expected, including a certain return to traditional resources, as well as shifts in timing related to a number of programmes connected to the use of renewable energy sources. At present, energy security in the European Union, and certain Member States in particular, are under serious threat. These are mainly countries whose energy mix consists of two basic resources, oil and natural gas, and where the level of energy security is low and is further threatened by the fact that these are countries with a historically significant reliance on imports from Russia.

Significant internal differentiation also plays a crucial role in addressing the EU's energy security. It has had a strong impact on energy in the context of political developments and perceptions of contemporary Russia. An essential feature of the internal differentiation in the energy sector in the EU lies in the differences in the energy mix of individual countries. These have been guided by many factors, especially the structure and focus of economies, the energy intensity of economies and, historically, the potential for and focus on the consumption of various energy resources. It should be noted that the perception of the EU as a single unit, but with great internal diversity in energy, has always limited the ability of EU institutions to effectively address this issue, particularly in the field of imports of Russian feedstock (Szulecki 2016: 562). The key issue, given its quantity and dependence on Russia, is to ensure sufficient quantities of natural gas. A June 2022 IMF Working Paper analyses the possible consequences of interruptions in the supply of natural gas from Russia in individual countries. The IMF identified the Czech Republic, Slovakia and Hungary as the countries most at risk from gas shortages and high prices as they were highly dependent on Russian gas imports and did not have alternative supply routes. However, in the current situation, the IMF forecasts have not fully come to pass. Other highly dependent countries, according to the IMF document, were Germany, Austria and Italy. These countries have relatively good infrastructure connections with neighbouring countries and are likely to be able to absorb shortages or the complete disconnection of gas supplies from Russia. Italy, which is also heavily dependent, is able to cover Russian gas supply shortages thanks to new contracts with alternative suppliers (IMF 2022).

The EU covered 42.5% of its gross annual consumption from national production, with 57.5% of energy resources having to be imported in 2020. The EU's energy consumption consisted mainly of oil (34.5%) and natural gas (23.7%), while RES accounted for 17.4% of consumption in 2020. Resources such as nuclear fuel and coal were of less significance, accounting for 12.7% and 11.5% of primary-energy consumption, respectively (Eurostat 2022). The composition of the energy mix differs significantly from one EU state to another. Traditional solid fossil fuels account for a significant share of the energy mix in Estonia (53%), Poland (41%) and the Czech Republic (31%). Nuclear fuel makes up the largest part of the energy mix in France (41%), while other countries such as Sweden, Slovakia, Slovenia and Bulgaria have shares of between 23% and 25%. Italy is the most dependent on natural gas, which accounts for 45.5% of gross energy consumption. The Netherlands also has a high share (38%), and Hungary has a 34% share. Small economies such as Cyprus, Malta and Luxembourg use oil most in their energy mix. Oil accounts for 87% of gross energy consumption in Cyprus, 86% in Malta and 60% in Luxembourg. Countries with favourable physical and geographical conditions are particularly successful in the use of renewable energy sources. These are mainly the Alpine region states and countries in the north of the EU. Renewable energy accounts for 48% of the energy mix in Sweden, 40% in Latvia, 38% in Denmark, 37% in Finland and 32% in Austria (Eurostat 2023).

The dependence on energy imports from abroad is high. There are also economic and political risks that affect the situation in the supply regions and on the feedstock routes to the EU. The degree of dependence shows the extent to which the economy relies on imports to meet its energy needs. It is measured by the share of net imports in gross inland energy consumption (i.e. the sum of energy produced and net imports). As mentioned above, more than half of the EU's inland consumption was covered by primary-energy imports; the indicator of overall energy dependence exceeded 57% in 2020, which means that more than half of the EU's energy needs were covered by net imports. This rate was lower compared to 2019 (over 60%), when the highest level of energy dependence on imports so far was achieved in the context of the economic crisis associated with the effects of COVID-19.

The highest import dependency was reported for oil, where the indicator approached 100% (96.2%). Import dependency on natural gas increased dramatically to 83.6%. The lowest import dependency among fossil sources was reported for coal (35.8%). The basic trend in the development of energy dependence is its growing rate, which has increased by 15 percentage points since the 1990s. Despite the long-term growing trend of primary-energy imports into the EU, import dependency decreased in a number of EU states between 2000 and 2020 (e.g. Estonia, Latvia, Sweden, Finland, Bulgaria, Romania, Slovakia and France); (Eurostat 2022).

Table 1: EU's energy dependency rate from 2000 to 2021 (%)

Import dependency	*2000*	*2019*	*2020*	*2021*
Total	56.3	60.5	57.5	55.5
Oil	92.8	96.8	96.0	95.2
Gas	65.7	89.7	83.6	83.4
Coal	29.8	43.2	35.8	37.5

Source: Eurostat 2023b.

All EU countries were net importers of primary energy in 2020. Malta, Cyprus and Luxembourg are the most import-dependent small EU countries without their own traditional resources. Despite strong growth since 2000 (22.7%), the Czech Republic's energy dependency rate remains at one of the lowest levels in the EU, reaching 38.9% in 2020. But it reached 100.2% in the case of oil. The countries with the lowest levels of energy dependence in 2020 were Estonia, Romania, Sweden, Bulgaria, the Czech Republic and Finland. Outside the EU, Norway is completely independent, with the indicator as much as -623.1%, Iceland also has a very low dependency rate (12%); (Eurostat 2022).

In the context of the current disruption of trade relations between the EU and Russia, changes can be observed in the EU's import dependency in terms of the total amount and value, and from the perspective of the changing structure of imports of individual energy resources and the fundamental departure from Russia as the largest supplier of energy resources to the EU. The effects on trade in energy products were expected after the imposition of economic sanctions, which directly and indirectly affected trade in oil and natural gas. The impact of several packages of sanctions was evident in the first three quarters of 2022. Due to the rapid increase in the prices of these commodities, there was also a significant increase in the value of imports. The value of imports increased by 18% in the second quarter of 2022; the average monthly value for 2021 increased to 166%. In this context, the value shares of individual energy resources also changed; the share of oil imports in total energy imports into the EU increased from 9.1% in 2021 to 11.3% in the third quarter of 2022. The increase in the share of natural gas was even stronger, climbing from 5.1% in 2021 to 13.2% in the third quarter of 2022. Contrary to their value, the composition of imported energy resources did not change significantly from 2021 to the first three quarters of 2022. Oil (56%) was imported in the largest volumes, followed by conventional natural gas (24%), coal (12%) and LNG (7%). Evaluating the amount of imported resources, the share in the case of oil decreased and there was an increase in the remaining three fuels. If we measure the value of imported energy

resources, the share of oil decreased by 11%, but price fluctuations caused an increase in the share of natural gas by 9.2 percentage points (Eurostat 2023a).

It is not just in the commodity and territorial structure that energy trade has seen changes; the total value of imported energy has also changed in terms of imported quantities and price developments. The rising prices of feedstock imported into the EU, rather than changes in the amount of imported energy resources, were mainly reflected in the total value of imported energy. In the context of the war in Ukraine and the development of mutual trade relations between the EU and Russia, there are significant changes in the territorial supply structure of oil and gas to the European Union in the most recent period of 2021 and 2022.

In this respect, Russia's position was significantly weakened in the short term. Russia was the largest supplier of oil and petroleum products to the EU in 2021, accounting for 24.8% of EU imports. The other largest oil importers to the EU were Norway (9.4%), the USA (8.9%), Libya (8.2%) and Kazakhstan (8%). However, the share of Russian imports to the EU was 14.4% in the third quarter of 2022, though Russia remained the largest importer of oil to the EU. Compared to 2021, this was a decrease of 10.5%. The USA (+3.0%), Norway (+1.1%), Saudi Arabia (+4%) and Iraq (+0.9%) increased their shares (Eurostat 2023a).

Table 2: EU's oil suppliers in 2021 and Q1–3 2022 (%)

supplier	*2021 value*	*2021 quantity*	*supplier*	*Q3 2022 value*	*Q32022 quantity*
Russia	24.8	25.8	Russia	14.4	18.3
Norway	9.4	9.0	USA	11.9	10.8
USA	8.9	8.4	Norway	10.4	9.9
Libya	8.2	8.0	Saudi Arabia	9.1	8.7
Kazakhstan	8.0	7.9	Iraq	7.6	8.5
Nigeria	7.2	7.0	Kazakhstan	6.8	6.5
Iraq	6.6	7.2	Libya	5.4	5.1
UK	5.2	5.2	Nigeria	5.4	4.8
Saudi Arabia	5.1	5.3	UK	5.0	4.7
Azerbaijan	4.7	4.5	Azerbaijan	4.6	4.0

Source: Eurostat 2023b.

Table 3: EU's natural gas suppliers in 2021 and Q1–3 2022 (%)

supplier	*2021 value*	*2021 quantity*	*supplier*	*Q3 2022 value*	*Q3 2022 quantity*
Russia	39.3	43.9	Norway	30.8	25.4
Norway	24.2	18.6	USA	15.2	14.8
Algeria	8.2	12.2	Russia	15.0	15.3
USA	7.1	5.8	UK	12.3	15.7
UK	6.2	5.7	Qatar	7.2	6.1
Qatar	4.9	4.6	Algeria	6.7	10.8
Azerbaijan	3.6	2.6	Azerbaijan	5.3	3.8
Nigeria	2.2	3.2	Angola	1.8	1.6
Libya	1.3	1.0	Nigeria	1.2	2.6
Other	3.0	2.3	Other	4.5	4.0

Source: Eurostat 2023b.

After the Russian invasion of Ukraine and in view of EU sanctions, the supply of natural gas from Russia has been steadily decreasing. From the largest supplier of natural gas to the EU in 2021, Russia ranked third after Norway and the USA in the third quarter of 2022. The USA accounted for more than 39% of EU gas imports in 2021, followed by Norway with 24% and Algeria with 8%. Compared to 2021, Russia's share decreased by 24.3 percentage points to 15.0% in the third quarter of 2022. The shares of Norway (+6.6%) and the USA (+8.2%) increased significantly.

In the period under review, from 2021 to the third quarter of 2022, the negative development of oil prices led to an increase in the value of imports into the EU from both Russia (+ €0.6 billion) and other external suppliers (+ € 11 billion). The significant increase in the value of importing countries outside Russia was also due to the increase in imported quantities, which replaced the gradual move away from imports from Russia. Compensation for Russian imports amounted to approximately €4.5 billion. In the case of natural gas, a sharp increase in the value of imports caused by increasing prices can be observed, with a decrease in imported quantities over the period in question. The increase in the value of imported gas reached 200%, among non-European suppliers it came to as much as 297%, and for Russia it was 56%. The volume of natural gas imports decreased by 4% overall in the reporting period; the volume of Rus-

sian gas decreased by 53%, but imports from other countries recorded a 35% increase (Eurostat 2023a).

IV. Discussion on the options for reorienting trade and strengthening EU's energy security

The discussion focuses on the opportunities to strengthen energy security in the context of changes in trade dependence on Russia, which was the main supplier of energy feedstock to the EU, but its position has recently changed substantially. In this context, the differences in the role played by Russia as an import partner for individual EU countries need to be considered. The EU's energy security can be strengthened via three main approaches. Diversification of feedstock supply and a change in the territorial structure of suppliers, especially oil and natural gas, are essential. Another principle relies on a change in the energy mix in the sense of optimising energy security. The last principle is associated with intensification, greater interconnection and completion of the internal energy infrastructure of the EU. In the approach to risk management in energy security, the portfolio risk management principle can be applied. Here, investors can benefit from diversification by investing in multiple assets. In this respect, diversification entails the creation of a portfolio that includes multiple positions in different assets to reduce risk (Stringer 2008: 128). Diversification then reduces the potential risk of the portfolio, as the probability of a decrease in the value of assets is lower than holding a single asset. This principle can also be applied when securing energy supplies, with a spread of energy resources in the energy mix, and energy imported from various suppliers (Stringer 2008: 127–128). The portfolio principle allows for a shortage of a particular energy resource or energy supplier to be replaced by another. The use of a portfolio thus makes it possible to face geopolitical risks as well. The diversified structure of energy resources and suppliers reduces the impact of the failure of individual resources or suppliers, and embraces alternative options. In the case of the European Union, regional advantages can be harnessed to increase energy security, but this requires the completion of the internal energy infrastructure, i.e. the application of the third principle. A discussion on the homogeneity of energy mix within the EU is pointless; individual states have different physical and geographical conditions allowing for more or less involvement and production of renewable energy sources, and it will be possible to compensate for energy shortages in the affected areas or states thanks to the interconnection of energy infrastructure.

The diversified supply structure can be monitored from the point of view of states – as energy producers, and in terms of the diversification of supply routes and states – as suppliers of energy resources to the EU associated with risks arising not only from the transport of resources through transit countries, but

also from the supplier states themselves. Focusing on the supply of natural gas, where, even in the third quarter of 2022, Russia was the main supplier with a 30% share in imports, the clear need to diversify supplies among a wide range of suppliers can be discussed. Even a relatively broad supplier mix does not provide supply security, as political risks and geopolitical interests may be latent. One opportunity to supplement the portfolio would be to extend the supply structure to include small, seemingly insignificant suppliers who could replace large importers in the event of a supply shortage. As the land factor was, until recently, a constraint on the transport of natural gas, and most of the natural gas was supplied by pipelines, the structure of the supply infrastructure to the EU reflects this. Russia, Norway and Algeria were the main suppliers of gas to the EU in 2021, i.e. geographically close countries where gas was transported via pipelines. The great risk posed by bilateral relations with Russia turned out to run deep after the invasion of Ukraine, and gas supplies became a truly key political tool. Two alternatives can be mentioned in terms of extending the possibilities of the structure of gas supply to the EU. The first is the expansion of LNG supply infrastructure and greater interconnection with the global gas market. The second option would be to build conventional infrastructure and connect the EU with new suppliers through gas pipelines, in particular in the Caspian Sea region. The EU is now connected to LNG supplies through 27 terminals; it was able to provide 40% of the total gas demand in the EU in 2021, with 23 more terminals planned to be built by 2027 and six terminals expected to be operational in 2023 (Selei 2022: 8).

Another way to address the change in the structure of energy supply flows to the EU and the shift away from imports from Russia could entail changes in the composition of the energy mixes of each country, which reflect energy consumption, with large disparities identifiable within the EU. It is necessary to diversify energy mixes, but these processes cannot be carried out in the short term because the energy mixes of individual countries are determined by the long-term specific patterns of economies and take into account strategic and security aspects. From this point of view, greater cooperation between EU countries is necessary; the basic tool here is the European Energy Union project, which favours a stronger position of renewable energy sources in the EU energy mix and the weakening of the importance of fossil sources in the EU energy mix. The EU's ambition is to increase the share of renewable energy sources in the energy mix to 32% by 2030. This goal may be impacted by a number of factors related to the war in Ukraine, but it could accelerate the readiness of the European energy market for decarbonisation and undoubtedly accelerate the departure from dependence on energy imports from Russia. In putting these developments in the context of mutual interdependence, this EU policy appears to be a fundamental threat to Russia's energy security in terms of Russian feedstock exports, which are crucial for the Russian economy. However, differences

in approach between Member States are also evident. Some countries are trying to promote the use of renewable energy sources (Denmark, Germany), others are more restrained (Poland, Hungary); different physical and geographical conditions (mountains, water) are another important factor. These differences undermine a unanimous European approach and lead to the promotion of particular interests in national energy strategies. It is therefore clear that the issue of energy mix diversification will be complicated, and a certain split between the EU into countries with a significantly higher share of renewable energy sources in the energy mix and countries with a higher share of fossil fuels can also be expected. A question mark hangs over the use of nuclear fuel, which contributes 12.7% to the EU's energy mix, see above (Eurostat 2022), and although the Energy Union project envisaged a reduction in nuclear energy, its role is currently being reassessed, national approaches differ, and some countries clearly prefer nuclear fuel as a transition resource in the context of decarbonisation.

Another requirement if the pattern of energy resource trade flows to the EU is to change is the existence of perfect infrastructure between Member States to allow for the comprehensive interconnection of countries and sufficient capacity. The downstream network will thus be able to eliminate supply shortages and ensure a sufficient amount of energy in endangered countries. From the point of view of supply diversification, a key factor is the elimination of natural preconditions that allow the coastal states to import LNG. In terms of maximising safety, it is necessary to connect all states to supplies from seaside terminals, as well as new suppliers from the Caspian Sea region. It should be noted that the concepts proposed in the history of expanding the EU's internal infrastructure due to the high dependence of the EU's eastern part on imports of fuels from Russia were contrary to the concept of transforming the energy mix aimed at increasing the use of renewable energy sources. The current state of relations between the EU and Russia could be said to have opened up another debate on the future direction of European energy. It has disrupted, yet perhaps in certain respects accelerated, the transition to environmentally sustainable energy. The process of changing the energy fuel flow to the EU is a relatively complex process in the short term and is impacted by numerous other factors; the task of quickly securing a replacement supply of fossil resources has become a pivotal task.

V. Conclusion

This study examined the issues of energy trade and energy security with a focus on the EU as part of the theoretical anchoring of mutual interdependence. Until recently, the EU's energy trade scheme relied on imports from Russia, where asymmetry of interdependence can be observed. The EU as a whole and the individual Member States rely heavily on foreign energy supplies as the demand for primary-energy resources significantly exceeds production and the EU does

not have significant fossil fuel reserves. The energy mix relies mainly on oil and gas, i.e. resources with minimal production and proven reserves in the EU. The EU's energy security is thus very unsatisfactory and the undiversified import structure with a dominant focus on Russia has changed from a risk to a crisis. However, with the energy crisis beginning to escalate in connection with Russia's aggression against Ukraine, the EU faces key challenges in energy security and related energy dependence requiring urgent solutions. The disruption of energy security is a typical asymmetric effect; a key issue is the position of the state in international trade, i.e. whether it is in the role of an energy resource importer or an exporter. International energy trade has thus become part of international cooperation and interdependence. The EU's import dependency on energy is very complicated for reasons such as high consumption, minimal primary-energy production and an inappropriate energy mix. The EU is a high-consuming region and the EU's policy focus on reducing the use of non-renewable energy sources also plays an important role due to the uneven distribution of energy resources in the world and the lack of resource facilities. The energy security of the EU, and in particular of certain Member States, is currently under serious threat. These are mainly countries whose energy mix consists of fossil fuels, oil and natural gas, which have a low level of energy security; these are countries historically reliant on imports from Russia. When addressing the issue of strengthening the EU's energy security, another crucial factor is the significant internal differences within the EU, which has had a major impact on the energy sector in connection with political developments and the perception of contemporary Russia. The dimension of dependence on energy imports from Russia is determined by geographical and historical factors and has influenced the concept and nature of energy security in individual states.

In the context of the current disruption of trade relations between the EU and Russia, changes can be observed in the EU's import dependency, both in terms of the total amount and value of imports, and in the changing structure of imports of individual energy resources and the fundamental shift away from Russia as the largest supplier of energy resources to the EU. The impact of the sanctions on Russia was felt in the first three quarters of 2022. Due to the rapid increase in the prices of these commodities, there was also a significant increase in the value of imports. It is not just in the commodity and territorial structure that energy trade has seen changes; the total value of imported energy has also changed in terms of imported quantities and price developments. The rising prices of feedstock rather than changes in the amount of imported energy resources were reflected in the total value of imported energy in the reporting period.

The final discussion focuses on the possibilities of strengthening energy security in the context of changes in trade dependence on Russia, which was the main supplier of energy feedstock to the EU, though its position has recently changed substantially. In this respect, it is necessary to consider the differences

in the role played by Russia as an import partner for individual EU countries. In order to strengthen the EU's energy security, three main approaches were identified when considering current conditions related to the war in Ukraine. Diversification of feedstock supply and a change in the territorial structure of suppliers, especially of oil and natural gas, are essential. Another principle relies on a change in the energy mix in the sense of optimising energy security. The final principle is associated with intensification, greater interconnection and completion of the internal energy infrastructure of the EU. However, in the context of the need for current changes, it should be noted that all solutions are time-consuming and are not fully applicable in the short term. As the current situation envisages further development of the issue examined here, further research needs to monitor changes in energy trade flows within the EU and individual Member States, as well as focus on the limits and risks associated with the further development and use of renewable energy sources and a return, in some respects, to certain traditional resources as a vehicle for transition.

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