

The Impact of the Russian-Ukrainian War on the European Union's Energy Security

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Abstract: The conflict between Ukraine and the Russian Federation has far-reaching consequences on international relations in general and the economies of neighbouring countries. This includes also a significant impact on the energy sector. The Russian invasion of Ukraine has disrupted global markets. The aim of the article is to analyse the impact of the Russian-Ukrainian war on the European Union's energy security, examine the measures taken by the EU to secure its gas supply, and suggest actions to be taken to enhance the security of supplies.

Key words: energy security, security of supply, European Union's energy policy, Russian-Ukrainian war

1. Introduction

Energy is essential to the proper functioning of today's countries, in every aspect of this functioning — from the individual dimension to the economic and political dimensions. In the event of an energy supply disruption, the entire economy is at the risk of being paralysed and citizens are deprived of access to basic amenities such as heating and electricity. Given the above, the energy sector has been named one of strategic importance to the functioning of a country. The goal of any country's energy policy is to make sure it has access to supplies of energy — referred to as energy security. It is quite difficult to adopt one general definition of energy security due to the interdisciplinary nature of the concept [Ruszel and Podmiotko, 2019]. In addition, the concept of security — including energy security — is also subjective, which further complicates the establishment of a universal definition thereof. It also makes it hard for all entities concerned to view it according to the same criteria because the perception and understanding of energy security depends on the view and perception of reality, and no objective factors can fully determine it [Przybojewska, 2017]. Nevertheless, it may be reasonable to quote the most common definitions of energy security. The International Energy Agency (IEA) defines energy security as uninterrupted access to energy, but also securing energy supplies at an affordable price [IEA, 2022]. On the other hand, in the European Union, energy security is considered as a state's ability to guarantee a steady, uninterrupted supply of energy at a price that can be paid while preserving the natural environment [Trubalska, 2017].

Kamila Pronińska argues that energy security threats can be divided according to the origin of the source of the threat. This includes external threats — i.e. all threats that lead to the disruption of supplies to a state or to world markets — and internal threats — i.e. for example, faulty energy infrastructure of a given state [Pronińska, 2012]. One of the biggest external threats to the energy security of countries that are importers of energy is the withholding of supplies of resources. Such a situation can be triggered by political or technical factors. Given that the Russian Federation is a major supplier of resources to the European Union, the current circumstances regarding the Russian-Ukrainian war are a significant threat to EU energy security. Tensions between the Russian Federation and Ukraine have been a fact for many years, as

proven by the numerous gas crises of 2006, 2009, and 2014, when Russia suspended its gas supplies, using energy resources as a means to achieve its own political goals, i.e. resorting to so-called energy blackmail [Lis, 2011]. Early 2022 marked the climax of the conflict. On 21 February 2022, after weeks of tensions, the President of the Russian Federation recognised the Donetsk and Luhansk regions as independent states and sent Russian troops to be stationed there. This was followed by an invasion of Ukraine, which began on 24 February [EU response..., 2022]. It was met with a harsh response from many countries and international organizations. It was also condemned by the European Union. The conflict between Ukraine and the Russian Federation has far-reaching consequences on international relations in general and the economies of neighbouring countries. This includes also a significant impact on the energy sector. The Russian invasion of Ukraine has disrupted global markets. Global fuel prices have risen sharply since the official outbreak of the conflict. This is of particular importance for the economies of EU countries. The fact that the European Union imported about 155 billion cubic metres of gas from the Russian Federation in 2021 (which is about 40% of its total imports) makes the latter number one third-country gas supplier [van Halm, 2022].

The Russian Federation has never been a reliable supplier of resources to the EU, which the aforementioned gas crises certainly prove. Reducing natural gas supplies is a kind of display of strength, aiming to emphasise Russia's dominance in the energy sector, which fits in with the underlying ideas of the school of realism [Ruszel, 2015]. Yet, the effect was quite different. After the outbreak of war with Ukraine, the Russian Federation lost the remnants of its credibility in the eyes of EU member states. The sanctions imposed by the EU made the Russian Federation suspend its supplies to some member states. This is a significant problem for them in light of the upcoming winter of 2022/2023. Therefore, at the moment, the European Union spares no effort to secure the supply of gas resources and increase the sourcing of gas from other suppliers.

The purpose of this article is to analyse the impact of the Russian-Ukrainian war on the European Union's energy security, examine the measures taken by the EU to secure its gas supply, and suggest actions to be taken to enhance the security of supplies.

The thesis of the article is that the Russian-Ukrainian war has had both a negative and a positive impact on the energy sector in the EU. Despite triggering a massive energy crisis, it has helped accelerate some of the processes and decisions relevant to strengthening the union's energy security.

This article has made use of the following research methods: source analysis method, content analysis, and normative method.

2. Energy sanctions imposed by the EU on the Russian Federation and their implications

The European Union and other countries have strongly condemned the Russian Federation's invasion of Ukraine [Hosoi and Johnson, 2022]. European Union has repeatedly demanded that it withdraw troops from Ukrainian territory and respect the latter's integrity and sovereignty. The EU has imposed 6 packages of sanctions on the Russian Federation since the beginning of the war. The article examines only those sanctions that apply to the energy sector.

The first sanctions that affected the energy sector were imposed in the second package of sanctions, which was announced on 25 February 2022. The European Union imposed an export ban on the sale, supply, transfer, and export of certain goods and technology for oil refining to

Russia and intends to impose restrictions on the provision of services related thereto. This export ban is set to hit the Russian oil sector and prevent Russia from modernising its refineries [*Russian military aggression...*, 2022].

The fourth package of sanctions, which the EU Council announced on 15 March 2022, banned new investments in Russia's energy sector, and imposed extensive export restrictions on equipment, technology, and services for the energy industry.

The fifth package of sanctions, announced on 8 April, banned the purchase, import, and transfer of coal and other solid fossil fuels from Russia. The ban has been in effect since August 2022. An interesting fact to mention here is that the value of coal imported from Russia annually amounted to €8 billion [*EU adopts fifth round...*, 2022].

The sixth package of sanctions, announced on 3 June 2022, includes a ban on imports of crude oil and refined petroleum products from Russia. As a result, EU member states have 6 months to become independent of oil supplies from Russia. In the case of other petroleum-based products, this period is 8 months. However, there are some temporary exceptions to the ban. One such exception applies to oil transported by pipeline to EU countries which are at a particular disadvantage due to their geographic location, and the only option for them is to import oil by pipeline from the Russian Federation for example Hungary [Harrison, 2022]. Such countries depend heavily on supplies from Russia. In addition, Bulgaria was granted a temporary derogation to be able to import Russian oil transported by sea, and Croatia has been allowed to continue to import vacuum gas oil [*Russian's aggressions...*, 2022].

In addition, the sixth package includes a ban on insuring Russian ships — which will also be implemented within six months. The ban affects oil shipments by sea because uninsured or insufficiently insured ships will not be able to enter any major port or pass through important maritime traffic bottlenecks such as the Bosphorus or the Suez Canal. An important thing to add here is that the marine insurance market is dominated by European and American companies [Vakulenko, 2022].

The aforementioned sanctions were intended to significantly hit the Russian Federation and reduce its revenues — which the country uses to finance the war in Ukraine. However, the announcement of an oil import embargo with a postponement of up to six months without immediate action caused oil prices to increase, which in turn resulted in high costs for member states and even higher revenues for the Russian Federation on account of the change [Martin and Mauro, 2022]. Moreover, new regulations that allow free purchases for another six months made Russian oil producers feel confident about the necessary investments. The EU removed a certain degree of uncertainty regarding a possible sudden ban that would leave cargoes stranded halfway [Vakulenko 2022].

As for the gas sector, following the Russian Federation's invasion of Ukraine, the Federal Republic of Germany halted the process of certification of the Nord Stream 2 gas pipeline [Rogozinskaya, 2022]. The decision was prompted by the events in the Donbas region — i.e. Russia's recognition of two independent republics in eastern Ukraine. This means that the decision to launch Nord Stream 2 is purely political at this point. The pipeline is now complete and ready to operate. The only thing necessary to set it in motion, so to speak, and start the transmission of gas from Russia is an official approval from the German administration. From the point of view of the raw materials policy, the halt is a fateful decision. This investment project, whose cost amounts to several billion zlotys at the moment, is currently blocked and

does not generate any profit whatsoever. In addition, Nord Stream 2 was to make Russia independent of transit countries and guarantee gas supplies under long-term contracts to Western European countries. At this point, Russia depends on gas supplies through Ukraine under a transit contract that remains valid until 2024. From the EU's point of view, the Nord Stream 2 pipeline would make European countries more dependent on gas supplies from Russia — which goes against the idea of an energy union. Now, the suspension of certification is one of the most painful sanctions of those imposed on the Russian Federation.

In order to make the sanctions more severe, the EU should also extend them to encompass the entire gas and nuclear sectors. The profits made from exporting uranium and fuel elements for nuclear power plants amount to hundreds of millions of euros per year. But it's hard to say whether such sanctions will be implemented because the EU is heavily dependent on both gas and uranium imports. For now, there is no agreement on how to deal with those two sectors. We should notice, though, that the sanctions imposed imply that there is a long-term plan to maintain these measures. The plan is to make the EU, seeking to decarbonise its economy, completely independent of Russian oil and gas, which is in line with its energy and climate policy.

In response to the imposed sanctions, the Russian Federation halted gas supplies to Poland and Bulgaria in April. The reason given was Poland's and Bulgaria's decision not to pay in roubles. Russia wanted to be paid in its national currency due to the adoption of new billing methods imposed on importers by Vladimir Putin's decree of 31 March. The decree imposed an obligation on buyers of Russian gas to set up foreign currency and rouble accounts with Gazprombank and to make payments following a two-step system: first, the due amounts were to be transferred in a given foreign currency, and then converted into roubles [Kardaś, 2022]. Most member states disapproved of the new rules set by the Kremlin. Russia hopes that the suspension of gas supplies will make at least some countries accept the new terms. This strategy aims also to drive a wedge between the member states and destabilise the EU as a whole — with the objective to hamper its decision-making processes.

Hungary was particularly ready and willing to pay Russia in roubles. On 31 August, Gazprom announced that it reached an agreement with Hungary to increase the volume of gas supplies by an additional 700 million cubic metres per year. The gas will be supplied via the TurkStream pipeline and received at Hungary's border with Serbia [Sadecki, 2022]. Hungary claims it has no other way to diversify its gas supplies. Yet, it seems that not enough has been done to address the issue. Hungary has an extensive and dense network of gas facilities connected to other countries. It also has access to the Croatian gas terminal (it makes use of only part of its reserved capacity). Moreover, after the opening of the Polish-Slovak interconnector, it has access to the so-called Northern Gate. But Hungary's policy is clearly pro-Russian and aimed at securing supplies from the Russian Federation — unlike in the case of the other member states. Some countries — including Bulgaria, Poland, Denmark, and Finland — rejected the new terms, but there were also countries that agreed to work with Russia on the terms in question. This leads to a serious debate and reveals the lack of unanimity in the approach to the foreign policy pursued by the EU.

Russian Federation regularly reduced gas supplies exported to EU countries in June 2022. The reductions affected mainly the Federal Republic of Germany, Italy, and France, and the supplies were limited on the day before the visit of President Emmanuel Macron, Chancellor

Olaf Scholz, and Prime Minister Mario Draghi to Kyiv [Kardaś, 2022]. Taking the above into account, it is fair to argue that the supply restrictions come in the form of energy blackmail and their aim is limit the support provided by Western countries to Ukraine. Russian hinted already in June that supplies through the Nord Stream 1 pipeline could be even completely halted. Further cuts occurred in the period of 11-21 July due to a technical inspection and from 31 August to 3 September due to repairs taking place at the Portovaya compression station. However, as early as September 2, Gazprom gave notice of a complete halt of supplies via the Nord Stream 1 pipeline. The official reason was that there were some irregularities at the Portovaya compression station. No expected date for the restoration of supply was given. But the storage capacity of Russia's gas storage infrastructure was at 92% [WNP, 2022]. The complete stoppage of gas supplies via a major pipeline dealt a significant blow to the gas market again. The prices soared by about 30% [Twidale and Buli, 2022]. Gas supplies from Russia have also been curtailed in pipelines running through Ukraine.

The map below, drawn up by the Polish Economic Institute, shows which countries are exposed and most vulnerable to the effects of a complete suspension of supplies from the Russian Federation. Red indicates high-risk countries with insufficient storage capacity, limited opportunities for supply diversification, and low storage fill (below 30 percent). Yellow, in turn, indicates medium-risk countries, affected by two of the three risk factors indicated. The map shows that at this point, the EU is not ready to stop the gas supplies from Russia completely. According to a report by the Polish Economic Institute [Lipiński, Maj Miniszewski, 2022], only seven countries in 2019 did not import gas directly from Russia. Yet, the share of Russian gas re-exported by other member states was significant; in the case of e.g. Austria, it was as high as over 60%. This only proves the importance of the Russian Federation in the ecosystem of gas supplies.

Fig. 1. Winter 2022/2023 - Mid-term risk in case of appearance with Russian gas supply.



Lipiński, K., Maj, M., Miniszewski, M. A European Union independent of Russia? Alternative Sources supplies of energy resources, Polish Economic Institute, Warszawa 2022

The sanctions imposed by the EU caused a quick response from the Russian side in the form of multiple interruptions of gas supplies, leading eventually to the suspension of gas supplies to key EU customers. This shows clearly that the Russian Federation is not a reliable supplier of energy resources and does not honour contracts. It treats energy resources as a tool to achieve political goals by resorting to so-called energy blackmail. Due to the fact that the Russian Federation is a key supplier of both gas and oil to the EU, supply disruptions have had a huge impact on energy markets in EU countries. The prices of raw materials and other resources and commodities have skyrocketed, triggering an energy crisis and concern over the security of gas supplies during the coming winter. The European Union has been working for years to guarantee energy security, defining it as uninterrupted availability of energy sources at affordable prices. Taking into account that gas prices in the past amounted to €30/MWh and to around €100/MWh in the first half of 2022, sometimes peaking above €200/MWh [*Short-Term Energy Market...*, 2022], the condition of “affordability” is not fulfilled and therefore it’s hard to speak of energy security. The increase in energy prices also impacts the overall economy because energy is a price-affecting factor. Growing energy prices are a major contributor to the widespread inflation and the slowdown in the economic growth in the EU. On the other hand, considering the second aspect of the definition of energy security, i.e. “uninterrupted availability of energy sources”, we should realise that this criterion, too, is currently unmet due to interruptions in gas supplies from the Russian Federation. However, if the EU enters into new contracts to supply LNG from the US, Azerbaijan, Australia, Libya or Egypt, and increases pipeline supplies from Norway and Algeria, it will be able to make up the shortfall in gas supplies [Lipiński, Maj, Miniszewski, 2022].

3. Measures taken by the EU to enhance the security of supplies

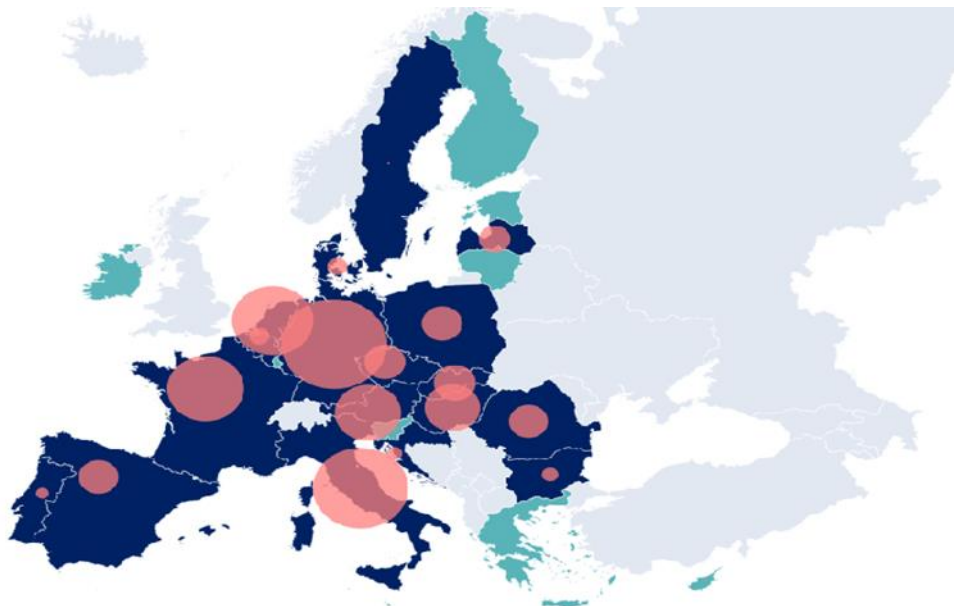
Heads of states and governments held an informal meeting in Versailles on 11 March 2022, which resulted in the adoption of the so-called Versailles Declaration — a commitment that included provisions aiming to enhance the security of the EU's energy supplies. One of the most important matters raised therein was the reduction of the import dependence on supplies from the Russian Federation. To this end, member states should diversify their energy sources, suppliers, and supply routes, including through the use of LNG and the development of biogas applications, and should continue to develop the hydrogen market. To increase energy independence, it is also necessary to invest in renewable energy sources, accelerate the procedures of granting permits to build and extend energy infrastructures, increase energy efficiency, and improve energy consumption management. On the other hand, in order to increase the security of energy supplies, it is important to finalise and streamline the interconnection of European gas and electricity networks, fully synchronise the different energy networks across the EU, and strengthen EU contingency planning. On account of the coming winter, it is necessary to make sure that there is sufficient gas in storage and to implement coordinated replenishment operations.

In May 2022, the European Commission announced the REPowerEU Plan [Communication from the Commission..., 2022]. The plan implements the provisions adopted in the Versailles Declaration and aims to accelerate the process of going towards independence from Russian resources, including speeding up the process of energy transition. First, the main objective is to save energy. The binding energy efficiency target would be increased from 9 to 13% compared to the 2020 Reference Scenario. Second, the idea is to diversify energy supplies and support international partners. The plan is to increase the extent of cooperation with international partners to diversify the portfolio of LNG and pipeline gas suppliers. The Commission also mentions joint gas purchases. It is also important to establish hydrogen corridors in the North Sea and the Mediterranean Sea. In the face of Russian aggression, the EU will provide support to Ukraine, Moldova, the countries of the Western Balkans, and the Eastern Partnership countries, as well as its most vulnerable partners [*Energy prices*, 2022]. To help the Ukrainian energy sector and secure energy supplies for the country, the EU will work with Ukraine under the REPowerUkraine initiative. Another objective is to spare no effort to increase and accelerate the use of renewable energy. The Commission proposes that the 2030 target for renewables be increased from 40 to 45%. The REPowerEU Plan also involves reducing fossil fuel consumption in industry and transportation and making smart investments. The efforts necessary to achieve the REPowerEU goals require an additional investment of €210 billion by 2027. The Recovery and Resilience Facility (RRF), modified and adapted to REPowerEU's demands, is to play a central role as the financing and planning instrument for the abovementioned activities.

In line with the above, at an extraordinary summit taking place on 30-31 May 2022, the European Council determined that by the end of 2022, the EU will stop importing almost 90% of its oil from Russia [*Energy Prices*, 2022]. The important thing is that this goal is achievable. Oil imports to EU countries have been steadily declining since 2010. In 2010, oil imports from Russia accounted for 34% of EU supplies. To compare, in the period of 2019-2020, this value was 25%. The EU's demand for oil could be satisfied with oil from Norway, Kazakhstan, the US or Iran [Polish Economics Institute, 2022].

To secure gas supplies, the EU Council adopted a new gas storage regulation in June [Regulation (EU) 2022/1032, 2022]. It obliges member states to fill their underground storage facilities before the winter of 2022/2023 to a level of 80% (and a minimum of 90% in subsequent years) and to share their gas stock with each other in the event of supply shortages or disruptions. At the community level, the EU will try to fill its storage facilities up to 85%. The regulation takes into account the fact that member states have different gas storage capacities. Therefore, member states will only be able to meet the storage target by including their stocks of LNG and alternative fuels, depending on conditions [Council adopts regulation on gas..., 2022]. Those countries that have significant storage capacity for domestic gas consumption will have to fill their underground storage facilities up to 35% of the average annual gas consumption over the past five years. Meanwhile, those countries that do not have their own underground storage facilities will be required to store 15% of their annual domestic gas consumption in storage facilities located in other member states. This way, they will have access to gas reserves stored in other countries. The regulation provides for derogations for Cyprus, Malta, and Ireland on account of the fact that they are not connected to the gas systems of other member states. The map below shows gas storage capacities in EU countries.

Fig. 2. Gas storage capacity in EU Member States.



<https://www.consilium.europa.eu/pl/infographics/gas-storage-capacity/>

An important thing to mention is that the EU has managed to reach an agreement on voluntary gas purchases. There is a plan to create a common European platform to enable companies to make gas purchases within the EU. This will help limit the increase in gas prices. Instead of outbidding each other, member states would make gas purchases together, which would increase their joint bargaining power.

One of the latest measures the EU has taken to secure gas supplies to consumers is the adoption of a regulation under which member states will voluntarily reduce gas demand by 15% in the period from 1 August 2022 to 31 March 2023 compared to the average consumption over the last five years [Council Regulation (EU) 2022/1369, 2022]. The regulation, however, enables the Council to declare — at the Commission's request — a state of emergency, in the case

of which this reduction will be mandatory. The Commission may come forward with such a request in a situation where there is a significant risk of a serious shortage of gas supply, where there is an unusually high demand for gas, or where there is a request from at least five competent authorities that have declared a state of emergency at the national level.

The Council provided for exceptions in this regulation as well. Countries that are not connected to the gas networks of other countries are exempt from the obligation to reduce the demand for gas because they would not be able to release sufficient quantities of gas to be provided to other member states. Moreover, those countries that are not synchronised with the European electricity system and are more dependent on gas for electricity production are also exempted — as long as they are desynchronised from the networks of a third country [*Council adopts regulation on reducing...*, 2022]. Member states can reduce the 15% target obligation if:

- they have limited interconnections with other member states and are able to prove that their export capacity and their domestic LNG infrastructure are being used to transfer gas to other member states to the maximum extent possible
- they have exceeded their targets for filling their storage facilities
- they are heavily dependent on gas as a feedstock for their key sectors

4. Proposed measures to enhance EU energy security

In order to secure supplies of energy for the winter of 2022/2023, the European Union must act quickly. First of all, it is important for the portfolio of gas suppliers to be diversified. It should include new reliable suppliers. Stability of supply is key to ensuring energy security. Further investments in transmission infrastructure and interconnectors between member states are also required to make sure that all member states have access to gas. Investments aiming to increase efficiency will translate into significant energy savings, which will then result in lower demand. Most importantly, however, it is crucial to invest in renewable energy sources, which can partially satisfy member states' energy demands. Green hydrogen — i.e. hydrogen produced without emissions — will be instrumental in replacing gas. Electrolysers, used to obtain hydrogen, are to be powered by RES. This way, green hydrogen fits into the EU's long-term energy and climate policy. Hydrogen can also be transported through gas pipelines, which means that the existing gas infrastructure can be used to transport hydrogen in the future. The decrease in the costs of producing energy from RES will make it possible, in turn, to lower the costs of production of green hydrogen. It is estimated that the price of green hydrogen over a 30-year horizon could reach \$1 per tonne [Kozdra, 2021].

Measures aimed at lowering energy prices are also necessary. To achieve this goal, it is important to intensify negotiations with reliable third-country gas suppliers and introduce appropriate instruments in the EU internal energy market. High gas prices lead to high electricity prices. Therefore, EU member states will be soon discussing the idea of setting a temporary cap on the price of gas used to produce electricity.

5. Conclusion

Russia's aggression against Ukraine has had a significant impact on the energy sectors of EU member states. The event has dramatically changed the direction of the energy policy of some member states, which until recently have relied on relatively cheap gas from Russia and

believed that these supplies would last — example being the Federal Republic of Germany. Germany, which until now has not expressed interest in joint gas purchases — which Poland has been advocating for since 2014, is inclined to consider such an idea at this point. The war in Ukraine has caused big changes as to the sourcing of supplies. First of all, there has been a significant shift away from importing energy resources from Russia in favour of importing resources from reliable third-country suppliers. It is expected that more gas and LNG will be imported from Norway, but also from Qatar or Iran. The EU is also seeking to increase imports of LNG from e.g. the United States, Australia, and Japan, and intends to sign trilateral agreements with Egypt and Israel [*In focus...*, 2022]. There is therefore no denying that the war has radically transformed the landscape of gas supply in the EU.

Initially, the war and the ensuing energy crisis in the EU were expected to slow down the implementation of energy and climate policies — including the pursuit of the objectives of the European Green Deal. It has turned out, however, to be a catalyst that drives the transformation of the energy sector. By increasing energy efficiency, significant energy savings are possible, which translates into lower energy consumption. At the same time, increasing the share of RES in energy production will make it possible to become independent from Russian resources.

To conclude, the impact of the Russian-Ukrainian war has caused a massive energy crisis in the EU, which, on the one hand, has undermined its energy security and posed a threat of gas shortage for the upcoming heating season, while, on the other hand, it has become a powerful for a range of new initiatives that should have been implemented long ago. This means first and foremost becoming independent from Russian supplies, which has been long discussed since 2014. In practice, however, countries like Germany have continually increased their energy dependence on Russia through projects such as Nord Stream 2. The apparent disparity between the official EU energy policy and the actions taken by particular countries has brought the EU energy sector to where — and what — it is today. Therefore, the most important issue at this point is to actually pursue a truly common EU energy policy towards third countries and — in particular — towards the Russian Federation.

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