

ZOLO TAROVA Oksana

 <https://orcid.org/0000-0003-2534-3125>

PhD (Technical), Associate Professor,
Associate Professor at the Department
of Commodity Science and Customs Affairs
State University of Trade and Economics
19, Kyoto St., Kyiv, 02156, Ukraine
o.zolotarova@knute.edu.ua

LUKASH Dmytro

 <https://orcid.org/0009-0003-0083-4654>

Customs clearance manager
JSC "Ukrasvydobuvannya"
d.lukash@knute.edu.ua

EU ENERGY SECURITY AMID GEOPOLITICAL CHANGE

The European Union has long faced significant energy security challenges due to its high dependence on external fossil fuel imports. The Russian-Ukrainian war exacerbated these vulnerabilities, prompting urgent policy shifts toward energy diversification, renewables, and greater energy sovereignty. This article hypothesises that while national interests have historically hindered the full integration of EU energy policy, the crisis has catalysed transformative policy changes aimed at enhancing energy security and expediting the transition toward sustainable energy sources. To verify this hypothesis, a qualitative content analysis of EU legislative documents, political strategies, and scientific research have been conducted, combined with a comparative analysis of previous and current energy crises. The findings confirm that EU energy policy has undergone a fundamental shift, particularly the reduction of dependence on Russian fossil fuels and the increase in liquefied natural gas (LNG) imports from the United States and Norway. The share of Russian gas imports has decreased from 45% in 2021 to just 15% in 2023, while renewable energy production has reached record

ЗОЛОТАРЬОВА Оксана

 <https://orcid.org/0000-0003-2534-3125>

к. т. н., доцент, доцент кафедри
товарознавства та митної справи
Державного торговельно-економічного
університету
вул. Кіото, 19, м. Київ, 02156, Україна
o.zolotarova@knute.edu.ua

ЛУКАШ Дмитро

 <https://orcid.org/0009-0003-0083-4654>

Менеджер з митного оформлення
АТ "Укргазвидобування"
d.lukash@knute.edu.ua

ЕНЕРГЕТИЧНА БЕЗПЕКА ЄС В УМОВАХ ГЕОПОЛІТИЧНИХ ЗМІН

Європейський Союз протягом тривалого часу стикається зі значними викликами у сфері енергетичної безпеки через високу залежність від імпорту викопного палива. Ця вразливість посилює російсько-українська війна, спонукаючи терміново змінити політику в напрямі диверсифікації енергетики, відновлюваних джерел енергії та більшого енергетичного суверенітету. Висунуто гіпотезу, що, хоча національні інтереси історично перешкоджали повній інтеграції енергетичної політики ЄС, криза стала каталізатором трансформаційних політичних змін, спрямованих на посилення енергетичної безпеки та прискорення переходу до стійких джерел енергії. Для перевірки цієї гіпотези проведено якісний контент-аналіз законодавчих актів ЄС, політичних стратегій та наукових досліджень, а також порівняльний аналіз попередніх і сучасних енергетичних криз. Результати підтверджують фундаментальні зміни в енергетичній політиці ЄС, зокрема зниження залежності від російського викопного палива, збільшення імпорту скрапленого природного газу (СПГ) зі США та Норвегії. Частка російського газу в імпорті ЄС скоротилася із 45% у 2021 р. до лише 15% у 2023 р., тоді як виробництво відновлюваної енергії



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levels – in 2023, wind energy surpassed the volume of electricity generation on natural gas for the first time. The growing role of renewable energy sources, supply diversification, and the challenges related to national policy fragmentation has been emphasized. Despite significant progress, further efforts are needed to align energy sovereignty with sustainable development goals and long-term economic stability. Promising directions for further research include the development of hydrogen energy, energy storage technologies, and regulatory mechanisms to strengthen the energy resilience of the EU.

Keywords: EU energy security, dependence on fossil fuel, transition to renewable sources, energy supply diversification, policy integration, geopolitical challenges.

JEL Classification Q48, Q42, Q41, H56, F52.

Introduction

Ensuring energy security has long been a strategic priority for the European Union (EU), given its high dependency on external fossil fuel supplies and the geopolitical risks associated with energy trade. The Russian-Ukrainian war has further underscored the fragility of the EU's energy system, accelerating the need for diversification, policy coordination, and a shift towards sustainable energy sources. The crisis has not only exposed the vulnerabilities of existing energy infrastructures but has also tested the resilience of EU energy governance, revealing the persistent challenge of balancing national interests with collective security objectives.

Recent scholarly works have explored various dimensions of this issue. LaBelle (2024) and Mišík and Nosko (2023) highlight the shift from energy interdependence to energy sovereignty and solidarity, arguing that the EU's response to the crisis has led to a reassessment of traditional energy security paradigms. Prisecaru (2022) examines the challenges of supply diversification, particularly regarding the feasibility of reducing dependence on Russian gas through alternative sources such as liquefied natural gas (LNG). Meanwhile, Banas and Melnyk (2024) and Streimikiene et al. (2023) analyse the acceleration of the green transition as an essential component of long-term energy security. Additionally, Nicoli et al. (2023) provide insights into public perceptions of energy cooperation, demonstrating that while public support for an integrated energy strategy is strong, political constraints remain a significant barrier.

Given the breadth and significance of existing research, an extensive systematic overview of the literature is presented in a dedicated section of this article, where the key scholarly contributions are analysed and synthesised in detail.

досягло рекордних рівнів – у 2023 р. вітрова енергетика вперше перевищила обсяги виробництва електроенергії на природному газі. Акцентовано увагу на зростаючій ролі відновлюваних джерел енергії, диверсифікації постачання та труднощах, пов'язаних із фрагментацією національних політик. Попри значний прогрес, необхідні подальші зусилля для узгодження енергетичного суверенітету з цілями сталого розвитку та довгострокової економічної стабільності. Перспективними напрямками подальших досліджень є розвиток водневої енергетики, технологій зберігання енергії та регуляторних механізмів для зміцнення енергетичної стійкості ЄС.

Ключові слова: енергетична безпека ЄС, залежність від викопного палива, перехід на відновлювані джерела, диверсифікація енергопостачання, інтеграція політики, геополітичні виклики.

This article identifies the main stages in the evolution of the EU energy security policy and outlines the key legislative and strategic instruments that have determined its current framework.

The research hypothesises that, while national interests have historically hindered the full integration of EU energy policy, the ongoing crisis has catalysed significant policy changes aimed at enhancing energy security and promoting a transition toward renewable sources. This dual hypothesis will be tested through qualitative content analysis of EU legislative documents, policy papers, scholarly articles, and expert assessments, complemented by a comparative analysis of past and present energy crises.

Methodologically, the study applies qualitative content analysis to EU legislative documents, strategic communications, and academic literature in order to identify key policy shifts and trends. This is complemented by a comparative analysis of EU responses to past and present energy crises to assess policy continuity and change.

The article is organised into three main sections. It begins by exploring the historical context and evolution of EU energy security policies, establishing a foundation for understanding how earlier developments have influenced current strategies. The second section presents a systematic review of scholarly contributions on the topic, highlighting significant themes and insights related to recent challenges and responses. Finally, the article examines the legislative frameworks and key initiatives that have emerged, assessing their effectiveness and the implications for EU energy security amidst ongoing geopolitical shifts.

By addressing these aspects, this study provides a comprehensive understanding of the EU's energy security framework and evaluates its effectiveness in achieving long-term resilience and stability goals. The findings will contribute to the broader discourse on European energy governance and inform future policy directions.

1. EU energy security: historical background and policy shifts

The importance of the European energy security strategy was first recognised during the oil crisis of the 1970s. In November 1974, the International Energy Agency (IEA) was established to ensure global oil supply security (IEA, 2022). The EU's efforts to develop a common energy policy began in the early 2000s, with the European Commission's Green Paper highlighting the increasing external energy dependence of the EU (European Commission, 2000, November 29).

Following this initiative, public debates on EU energy security were reflected in the Final Report on the Green Paper (European Commission, 2002, June 26), which highlighted demand management and energy efficiency as strategic priorities. This shift in focus underscored the need for a coordinated European approach to energy policy, particularly as individual member states faced growing external vulnerabilities.

The necessity for a unified external energy policy became increasingly evident after the 2006 Russia-Ukraine gas dispute, which exposed the EU's dependence on Russian energy supplies and the political risks associated with it (European Parliament Committee on Foreign Affairs, 2007). In response, the European Commission's 2007 energy strategy identified three core principles for European energy security policy: sustainability, security of supply, and competitiveness (European Commission, 2007, November 20). However, as Closson (2008) noted, despite these advancements, many EU member states remained reluctant to cede sovereignty over energy policy to Brussels, posing a significant challenge to deeper integration.

The 2009 Russia-Ukraine gas crisis further reinforced the urgency of revising the EU's energy security framework. In response, the EU adopted the Regulation on Security of Gas Supply (2010), which introduced mandatory risk assessments, emergency preparedness plans, and reverse flow capabilities to mitigate supply disruptions (European Parliament & Council of the European Union, 2010). Additionally, the Treaty of Lisbon (2007) formally enshrined energy policy as a shared competence within EU primary law, with Article 194 of the Treaty on the Functioning of the European Union (TFEU) outlining key objectives such as energy market integration, supply security, efficiency, and renewable energy development (Treaty of Lisbon, 2007; Huhta, 2021).

By 2014, the EU took further steps to reduce its dependence on Russian energy imports. The European Energy Security Strategy prioritised supply diversification and energy infrastructure development, aiming to strengthen energy resilience across the bloc (European Commission, 2014). These efforts were reinforced by the Energy Union Strategy, which expanded focus beyond energy security to include market integration, decarbonisation, and innovation (European Commission, 2015). Recognising the strategic importance of natural gas and oil, the EU introduced the Gas Supply Regulation, which enhanced regional cooperation and crisis response mechanisms (European Parliament & Council of the European Union, 2017).

Additionally, the EU established the Trans-European Networks for Energy (TEN-E) policy, which defined nine priority corridors and three thematic areas to improve cross-border energy integration and efficiency (Ciucci, 2021). Meanwhile, energy efficiency was increasingly viewed as a key energy security measure, with studies emphasising its role in reducing the EU's dependence on external suppliers (Ghantous, 2022, March 8).

Russia's invasion of Ukraine in February 2022 prompted urgent and specific actions from the European Union (EU) to reduce its dependency on Russian energy sources. Some academicians and economists have referred to the economic situation resulting from the Ukrainian-Russian conflict as either an asymmetric shock (Redeker, 2022) or stagflation (Canuto, 2022).

The European Commission, in its Communication, aims to make Europe independent from Russian fossil fuels well before 2030 (European

Commission, 2022). This plan outlines measures to mitigate retail prices, support companies, and ensure sufficient gas storage as preparations for the coming winter. The RePowerEU initiative seeks to diversify gas supplies, accelerate the rollout of renewable gases, and replace gas usage in heating and power generation through ten key actions, including increasing biogas production, enhancing energy efficiency, and boosting solar energy capacity (European Commission, 2022, March 8).

In March 2022, the International Energy Agency published a plan to reduce the EU's imports of russian natural gas by more than one-third within a year, aligning with the objectives of the European Green Deal to support both energy security and affordability (IEA, 2022, March 3). On March 14, 2022, High Representative/Vice President Josep Borrell stated in his blog that "EU leaders agreed... to bolster European economic resilience, radically reduce our energy imports from russia and move ahead with a serious strengthening of European defence" (Borrell, 2022, March 14).

Furthermore, on March 25, 2022, the President of the European Commission emphasised the support of the United States in "strengthening Europe's energy security and independence from russian fossil fuels". This initiative aims to eliminate dependency on russian energy supplies through investments in renewables and additional gas supplies from trustworthy and reliable suppliers. The United States also committed to providing the EU with an additional 15 billion cubic meters of liquefied natural gas (LNG) in 2022 (European Commission, 2022, March 25).

2. Systematic review of scholarly contributions on the topic

The evolving landscape of EU energy security has been widely examined in recent scholarship, with researchers analysing the geopolitical, economic, and policy dimensions of the crisis. This section provides a structured review of key contributions, highlighting major themes such as the end of energy interdependence, diversification efforts, the acceleration of the green transition, and policy effectiveness in securing long-term energy resilience.

2.1. End of energy interdependence and the rise of sovereignty and solidarity

Before the war, EU-russia energy relations were built on interdependence, where natural gas and oil flows were integral to both economic and geopolitical stability (Tichý & Dubský, 2024). However, as Yakoviyk and Tsvelikh (2023) emphasise, russia weaponised its energy exports by demanding payments in roubles, reducing Nord Stream gas supplies, and leveraging its energy dominance for political influence. The resulting energy crisis forced the EU to rethink its strategic approach, prompting a shift from interdependence to energy sovereignty and solidarity (LaBelle, 2024).

While solidarity mechanisms such as joint gas purchases and collective energy security measures have been proposed, Mišík and Nosko (2023)

highlight the paradox of EU energy security: although greater integration would enhance resilience, individual member states resist collective decision-making, prioritising short-term national energy security interests. This reluctance was evident in negotiations over gas-sharing agreements, where some states hesitated to reduce consumption to support more affected regions. Nonetheless, as Nicoli et al. (2023) demonstrate through an extensive cross-national survey, public support for a unified Energy Union is high, particularly in Western European countries, indicating political feasibility for deeper cooperation in the future.

In this context, Zubko (2023) provides an important perspective on how international cooperation, particularly with the EU, has shaped the resilience of Ukraine's energy sector. The analysis emphasises that EU assistance and the integration of Ukraine's energy system into the ENTSO-T network played a pivotal role in stabilising energy governance during the war. This reinforces the broader argument that energy solidarity and interconnectivity are vital not only within the EU but also with neighbouring partners seeking alignment with EU energy frameworks.

2.2. Energy diversification: LNG, alternative suppliers, and hydrogen solutions

The war also intensified efforts to diversify energy sources, reducing reliance on Russian fossil fuels. Prisecaru (2022) outlines the challenges of energy diversification, noting that while the EU imposed sanctions on Russian energy, finding alternative suppliers for LNG, coal, and oil remains difficult due to global supply constraints.

Beyond LNG, the Middle East has emerged as a potential alternative energy partner. Al-Saidi (2023) questions whether the region will become a "white knight" in EU energy security or merely another supplier within a broader diversification strategy. Meanwhile, Liu et al. (2023) propose hydrogen infrastructure as a long-term replacement for fossil fuels, arguing that by 2060, hydrogen-based energy systems could fully substitute Russian imports, except for oil. These solutions, however, require massive infrastructure investments and regulatory adjustments.

2.3. Acceleration of the green transition and energy security measures

While immediate energy security concerns dominated EU policy-making in 2022, the crisis also accelerated the green transition. Banas and Melnyk (2024) analyse how the REPowerEU plan has redefined the EU's energy landscape, emphasising renewable energy integration, infrastructure modernisation, and regulatory frameworks to reduce fossil fuel dependence. Similarly, Streimikiene et al. (2023) propose a comparative framework to measure energy security across EU regions, identifying that while some states (e.g., Scandinavia) already demonstrate high energy security, Eastern

and Southern European nations remain vulnerable due to lower diversification levels.

Osička and Černoch (2022) highlight the paradigm shift in European energy policy, where natural gas—previously considered reliable—is now seen as expensive and politically volatile, further reinforcing the urgency of transitioning towards renewables. However, as they caution, a poorly coordinated transition could trigger economic instability, particularly in industrial sectors reliant on traditional energy sources.

Mazaraki and Melnyk (2024) offer a complementary view, examining the broader implications of the fourth global energy transition for national and regional security frameworks. They argue that managing energy security under the pressures of war, climate change, and economic crises demands a conceptual recalibration of policy. Their work emphasises the role of systematisation and scenario planning in neutralising new threats during the green transition, thereby supporting the case for more adaptive and multi-layered policy mechanisms in the EU and its neighbourhood.

2.4. Assessing EU Energy Security: Policy Effectiveness, Governance Challenges, and Future Integration

To assess the effectiveness of EU policy responses, multiple studies have examined quantitative indicators of energy security. Brodny and Tutak (2023) employ a multi-criteria decision-making (MCDM) model to rank the energy security levels of EU-27 countries, revealing significant regional disparities. Their analysis confirms that Scandinavian countries exhibit the highest levels of resilience, while Eastern European nations face greater risks due to infrastructural and economic limitations.

Similarly, Sadowska (2022) assesses the EU's policy adjustments following the Russian invasion, evaluating measures taken to secure gas supplies and suggesting additional steps for enhancing energy resilience. Her findings align with Prisecaru's (2022) argument that while sanctions effectively reduced Russian imports, the EU still struggles to fully replace these energy flows without price volatility and supply disruptions.

Finally, the war has reshaped discussions on EU energy governance. Nicoli et al. (2023) provide empirical evidence that European citizens support stronger institutional mechanisms for energy security, favouring policies that include joint procurement, centralised governance, and enhanced regulatory coordination. However, as Mišík (2022) and Mišík and Nosko (2023) argue, achieving consensus among member states remains a major obstacle, given the persistent fragmentation of national energy policies.

Moreover, Yakoviyk and Tsvelikh (2023) stress that energy security is now deeply intertwined with geopolitical stability, as rising transportation costs and inflation have broader implications for EU economic and political dynamics. In this regard, Atamanenko and Piddubnyi (2023) argue that while the EU has successfully reduced hydrocarbon imports from Russia, this

diversification process has introduced new risks, including price instability and supply chain vulnerabilities.

To summarise, the russian-Ukrainian war has reshaped the EU's energy security, driving a shift towards resilience, diversification, and sovereignty. Studies highlight that the future of EU energy security will depend on balancing diversification, sustainability, and economic stability, with further research needed on the role of hydrogen, nuclear, and advanced renewables in ensuring long-term resilience.

3. EU energy dependency: trends, challenges, and policy shifts

The European Union (EU) has long been dependent on energy imports, with its energy import dependency rate steadily increasing over the past few decades. As early as 1990, the EU imported approximately 50% of its total energy needs, a figure that continued to rise due to declining domestic production and growing demand (Eurostat, n. d. a). By 2022, energy dependency reached 62.5%, underscoring the EU's structural reliance on external energy sources, particularly crude oil (97.7%) and natural gas (97.6%) (Eurostat, n. d. b).

Natural gas imports more than doubled between 1990 and 2022, with russia historically serving as the EU's primary supplier. The trend was further exacerbated by the progressive decline in domestic fossil fuel production, especially natural gas (−64.9%) and coal (−38.7%) over the past decade (Eurostat, n. d. b). Although the EU had begun investing in renewables, fossil fuels remained dominant in its energy mix well into the early 2020s, leaving the bloc vulnerable to geopolitical disruptions and supply shocks.

3.1. Impact of the russian invasion and the decline of fossil fuel imports

The russian invasion of Ukraine in 2022 served as a turning point in the EU's energy strategy, prompting an urgent reassessment of energy security. In response, the EU implemented gas-saving measures, diversified its energy imports, and significantly ramped up renewable energy production. As a result, gross available energy in the EU decreased by 4.5% in 2022, while natural gas consumption dropped by 13.3% compared to 2021 (Eurostat, n. d. a).

Natural gas, once the backbone of the EU's energy system, saw a 14.6% decline in net imports in 2023, marking the continuation of a downward trend. Inland gas consumption also fell by 7.4% from 2022 and 19.4% from 2021, reflecting a strategic shift away from russian supplies. russia's share of EU gas imports plummeted from 45% in 2021 to just 15% in 2023, as the EU increasingly turned to Norway, the United States, and Qatar for liquefied natural gas (LNG) (Eurostat, n. d. b).

Coal and oil imports also followed a downward trajectory. After a temporary rise in 2021 and 2022 due to post-pandemic energy demand, coal

consumption fell to record lows in 2023, with lignite use declining by 24.2% and hard coal by 25.8%. Similarly, oil dependency declined, with refinery demand for crude oil dropping by 1.7% in 2023, reinforcing the EU's long-term strategy to reduce fossil fuel reliance (Eurostat, n. d. a).

3.2. Role of renewables in reducing energy dependency

A key driver of the EU's decreasing reliance on fossil fuel imports is the rapid expansion of renewable energy. In 2023, for the first time, electricity generated from wind exceeded that from natural gas, marking a major milestone in the energy transition. Renewables accounted for 44.7% of total electricity production, surpassing fossil fuels (32.5%) (Eurostat, n. d. b). This transition aligns with the REPowerEU plan, which prioritizes energy diversification, efficiency, and clean energy technologies such as hydrogen and solar power.

Despite these achievements, the EU remains highly dependent on energy imports, particularly natural gas, with 88% of its gas supply in 2023 still coming from external sources. The long-term success of the EU's energy strategy will hinge on further investments in renewable energy infrastructure, energy storage capacity, and alternative fuel development (Eurostat, n. d. a).

3.3. EU energy policy shifts amid geopolitical crisis

According to Birol and von der Leyen (2024), Europe has significantly reduced its dependence on Russian energy, with the share of Russian fossil fuels in the EU's total energy supply dropping from 45% before the war to just 5% in 2023. The rapid expansion of alternative suppliers, such as Norway, the United States, and Qatar, has been a key driver of this shift. At the same time, the EU's transition towards renewable energy reached a major milestone in 2023 when, for the first time, electricity generated from wind exceeded that from natural gas.

Before Russia's invasion of Ukraine, 20% of the EU's energy came from Russian fossil fuels, whereas today, that figure has dropped to just 5%. Additionally, Russian gas imports have plummeted from 45% before the war to 15% in 2023. The shift has been supported by an increase in LNG imports from the United States and Qatar, with global LNG supply expected to rise by 50% in the second half of the decade. While this may lead to lower gas prices, the EU remains committed to its decarbonisation goals, aiming for near-zero methane emissions and further scaling up renewable energy, clean hydrogen, and energy efficiency (Birol & von der Leyen, 2024).

Despite its progress, Europe faces new challenges, including balancing energy security with affordability and sustainability. While LNG has become the EU's baseload gas supply, policymakers stress that cheaper gas should not slow the transition to a net-zero economy. Future efforts will focus on clean energy technologies and industry cooperation, as demonstrated by the Clean Transition Dialogues initiated by the European Commission. The EU's ability to navigate energy crises and restructure its market demonstrates a long-term commitment to energy sovereignty, sustainability, and economic resilience (Birol & von der Leyen, 2024).

Conclusions

The Russian invasion of Ukraine in 2022 marked a profound and transformative moment in the energy landscape of the European Union (EU), catalysing a shift away from dependency on Russian fossil fuels and fostering a renewed emphasis on energy sovereignty, diversification, and sustainability. Scholarly analyses underscore the multifaceted nature of this transformation, encompassing the dismantling of traditional energy interdependence with Russia, the emergence of alternative energy suppliers, the expedited transition towards greener energy sources, and the complexities of policy coordination among member states.

The findings affirm the dual hypothesis that the ongoing crisis has catalyzed significant policy changes aimed at enhancing energy security while simultaneously exposing the hindrances posed by national interests to the full integration of EU energy policy. Key results reveal a drastic reduction in natural gas imports from Russia, accompanied by a notable increase in LNG imports from alternative suppliers. Investment in renewable energy sources and hydrogen technology has accelerated, with historic milestones achieved, such as wind energy production surpassing that of natural gas for the first time. These results underscore the success of the EU's efforts to transition toward a more resilient energy framework.

This study thoroughly examines the evolution of EU energy security policy against the backdrop of geopolitical shifts stemming from the Russian-Ukrainian war. While it confirms that national interests continue to present challenges in achieving a unified energy security framework, it also highlights a strong public support for deeper cooperation and integration within the EU. Despite this support, member states frequently prioritize their short-term energy security needs over collective goals, underscoring the need for further efforts to navigate the complexities of national interests in pursuit of a cohesive energy strategy.

The research contributes to the existing literature by providing a comprehensive analysis of the systemic shifts in energy policy following the crisis. Notably, it identifies a significant move away from energy interdependence towards energy sovereignty and solidarity among EU member states. This transition highlights the necessity for a coordinated approach to energy security that balances national priorities with collective resilience. Additionally, the findings point to the enhanced emphasis on diversifying energy sources and the accelerated push for renewable energy, which are crucial for long-term sustainability.

Further, the study reveals additional, unplanned outcomes such as the relative decline of Russian fossil fuel imports, which decreased dramatically from 45% to 15% within a span of two years. This surprising trend underscores the EU's ability to adapt amidst crises, with a notable shift towards energy sources from the United States, Norway, and other reliable partners. The role of public sentiment, as evidenced by various surveys, indicates a growing consensus on the need for a unified Energy Union, despite the political fragmentation that currently inhibits this process.

Looking ahead, the research highlights several practical implications for policymakers. Investing in renewable energy infrastructure and developing new regulatory frameworks will be critical for ensuring energy security while transitioning towards a low-carbon economy. Future research should focus on exploring the potential of hydrogen and advanced renewable technologies in strengthening energy resilience, alongside further investigations into the economic impacts of energy policy shifts on EU member states.

In conclusion, this study not only sheds light on the present dynamics of EU energy security but also emphasises the need for ongoing evaluation and adjustments in policy frameworks to adapt to an evolving geopolitical landscape. The pursuit of energy sovereignty must be harmonised with sustainability efforts to achieve long-term energy security and stability within the EU.

REFERENCE / СПИСОК ВИКОРИСТАНИХ ДЖЕРЕЛ

Al-Saidi, M. (2023). White knight or partner of choice? The Ukraine war and the role of the Middle East in the energy security of Europe. *Energy Strategy Reviews*, (49), 101116. <https://doi.org/10.1016/j.esr.2023.101116>

Atamanenko, A., & Piddubnyi, V. (2023). The Impact of the russian-Ukrainian War on EU Energy Security. *Acta de Historia & Politica: Saeculum XXI*, Special Issue, 35–47. <https://dspace.chmnu.edu.ua/jspui/handle/123456789/1723>

Атаманенко, А., & Піддубний, В. (2023). Вплив російсько-української війни на енергетичну безпеку ЄС. *Acta de Historia & Politica: Saeculum XXI*, Спеціальний випуск, 35–47. <https://dspace.chmnu.edu.ua/jspui/handle/123456789/1723>

Banas, D., & Melnyk, T. (2024). The transformation of the European Union's energy sector. *Problemy Ekorozwoju*, 19(2), 293–308. <https://doi.org/10.35784/preko.6015>

Birol, F., & von der Leyen, U. (2024). *Europe has taken its energy destiny back into its own hands*. International Energy Agency. <https://www.iea.org/commentaries/europe-has-taken-its-energy-destiny-back-into-its-own-hands>

Borrell, J. (2022, March 14). *The war in Ukraine and its implications for the EU*. European Union External Action Service. https://eeas.europa.eu/headquarters/headquarters-homepage_en/112754

Brodny, J., & Tutak, M. (2023). Assessing the energy security of European Union countries from two perspectives – A new integrated approach based on MCDM methods. *Applied Energy*, (347), 121443. <https://doi.org/10.1016/j.apenergy.2023.121443>

Canuto, O. (2022). *War in Ukraine and risks of stagflation*. Policy Center for the New South. https://www.policycenter.ma/sites/default/files/2022-03/PB_18-22_Canuto_0.pdf

Ciucci, M. (2021). *Energy policy: General principles*. Fact Sheets on the European Union. The European Parliament. https://www.europarl.europa.eu/ftu/pdf/en/FTU_2.4.7.pdf

Closson, S. (2008). *Energy security of the European Union*. CSS Analyses in Security Policy, 3(36). ETH Zurich. https://www.files.ethz.ch/isn/56057/CSS_Analysen_36_e.pdf

European Commission. (2000, November 29). *Green Paper: Towards a European strategy for the security of energy supply (COM/2000/769 final)*. <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex:52000DC0769>

European Commission. (2002, June 26). *Final report on the Green Paper: Towards a European strategy for the security of energy supply*. <https://op.europa.eu/en/publication-detail/-/publication/04a1827d-3425-49eb-bdfe-f3bc48d1e724>

European Commission. (2007, November 20). *An energy policy for Europe*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A127067>

European Commission. (2014). *European energy security strategy* (COM/2014/0330 final). <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0330>

European Commission. (2015). *A framework strategy for a resilient energy union with a forward-looking climate change policy* (COM/2015/80 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:80:FIN>

European Commission. (2022). *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions* (COM/2022/108 final). REPowerEU: Joint European action for more affordable, secure and sustainable energy. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A108%3AFIN>

European Commission. (2022, March 25). *Statement by President von der Leyen with US President Biden*. https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_22_2043

European Commission. (2022, March 8). *REPowerEU: Joint European action for more affordable, secure and sustainable energy*. Press release of the European Commission. https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1511

European Parliament and Council of the European Union. (2010). Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC. *Official Journal of the European Union*, L 295, 1–22. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32010R0994>

European Parliament and Council of the European Union. (2017). *Regulation (EU) 2017/1938 of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010*. *Official Journal of the European Union*, L 280, 1–56. <http://data.europa.eu/eli/reg/2017/1938/oj>

European Parliament Committee on Foreign Affairs. (2007). *Towards a common European foreign policy on energy*. <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A6-2007-0312+0+DOC+XML+V0//EN>

Eurostat. (n. d. a). *Energy statistics – an overview*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview

Eurostat. (n. d. b). *Energy production and imports*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_production_and_imports

Ghantous, N. (2022, March 8). *Energy efficiency equals energy security*. *Energy Monitor*. <https://www.energymonitor.ai/tech/energy-efficiency/energy-efficiency-equals-energy-security>

Huhta, K. (2021). The scope of state sovereignty under article 194(2) TFEU and the evolution of EU competences in the energy sector. *International and Comparative Law Quarterly*, 70(4), 991–1010. <https://doi.org/10.1017/S0020589321000269>

IEA. (2022). *History: From oil security to steering the world toward secure and sustainable energy transitions*. International Energy Agency. <https://www.iea.org/about/history>

IEA. (2022, March 3). *A 10-Point Plan to Reduce the European Union's Reliance on russian Natural Gas*. <https://iea.blob.core.windows.net/assets/1af70a5f-9059-47b4-a2dd-1b479918f3cb/A10-PointPlanToReduceTheEuropeanUnionsRelianceonrussianNaturalGas.pdf>

LaBelle, M. C. (2024). Breaking the era of energy interdependence in Europe: A multidimensional reframing of energy security, sovereignty, and solidarity. *Energy Strategy Reviews*, (52), 101314. <https://doi.org/10.1016/j.esr.2024.101314>

Liu, J. L., Fu, J., Wong, S. S., & Bashir, S. (2023). Energy security and sustainability for the European Union after/during the Ukraine crisis: A perspective. *Energy & Fuels*, 37(5). <https://doi.org/10.1021/acs.energyfuels.2c02556>

Mazaraki, A., & Melnyk, T. (2024). Energy security: new challenges and global trends. *Scientia fructuosa*, 3(155), 4–22. [https://doi.org/10.31617/1.2024\(155\)01](https://doi.org/10.31617/1.2024(155)01)

Мазаракі, А., & Мельник, Т. (2024). Енергетична безпека: нові виклики та світові тренди. *Scientia fructuosa*, 155(3), 4–22. [https://doi.org/10.31617/1.2024\(155\)01](https://doi.org/10.31617/1.2024(155)01)

Mišík, M. (2022). The EU needs to improve its external energy security. *Energy Policy*, (165), 112930. <https://doi.org/10.1016/j.enpol.2022.112930>

Mišík, M., & Nosko, A. (2023). Each one for themselves: Exploring the energy security paradox of the European Union. *Energy Research & Social Science*, (99), 103074. <https://doi.org/10.1016/j.erss.2023.103074>

Nicoli, F., van der Duin, D., & Burgoon, B. (2023). Which energy security union? An experiment on public preferences for energy union alternatives in five Western European countries. *Energy Policy*, (183), 113734. <https://doi.org/10.1016/j.enpol.2023.113734>

Osička, J., & Černoch, F. (2022). European energy politics after Ukraine: The road ahead. *Energy Research & Social Science*, (91), 102757. <https://doi.org/10.1016/j.erss.2022.102757>

Prisecaru, P. (2022). The war in Ukraine and the overhaul of EU energy security. *Global Economic Observer*, 10(1). http://www.globeco.ro/wp-content/uploads/vol/GEO_Vol_10_No_1.pdf#page=16

Redeker, N. (2022). *Same shock, different effects: EU member states' exposure to the economic consequences of putin's war. Policy brief.* Hertie School, Jacques Delors Center. https://www.delorscentre.eu/fileadmin/2_Research/1_About_our_research/2_Research_centres/6_Jacques_Delors_Centre/Publications/20220307_Economic_Consequences_Ukraine_Redeker.pdf

Sadowska, E. (2022). The impact of the russian-Ukrainian war on the European Union's energy security. *Energy Policy Studies*, 2(10), 41–52. <https://doi.org/10.62316/SJDE2421>

Streimikiene, D., Siksnyte-Butkiene, I., & Lekavicius, V. (2023). Energy diversification and security in the EU: Comparative assessment in different EU regions. *Economies*, 11(3), 83. <https://doi.org/10.3390/economies11030083>

Tichý, L., & Dubský, Z. (2024). The EU energy security relations with russia until the Ukraine war. *Energy Strategy Reviews*, (52), 101313. <https://doi.org/10.1016/j.esr.2024.101313>

Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community. (2007). *Official Journal of the European Union*, (306), 1–271. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12007L%2FTXT>

Yakoviyk, I. V., & Tselikh, M. P. (2023). Energy security of the European Union in the context of russian aggression against Ukraine. *Problems of Legality*, (160), 170. <https://doi.org/10.21564/2414-990X.160.274518>

Zubko, T. (2024). International cooperation in the energy sector. *Foreign trade: economics, finance, law*, 135(4), 25–37. [https://doi.org/10.31617/3.2024\(135\)02](https://doi.org/10.31617/3.2024(135)02)

Зубко, Т. (2024). Міжнародне співробітництво в енергетичній сфері. *Зовнішня торгівля: економіка, фінанси, право*, 135(4), 25–37. [https://doi.org/10.31617/3.2024\(135\)02](https://doi.org/10.31617/3.2024(135)02)

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