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ENERGY SECURITY POLICY IN EUROPEAN UNION AND LITHUANIA

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Abstract. *Energy security remains a multifaceted and dynamic concept influenced by a variety of factors, including geopolitical developments, technological advances, and environmental considerations. The field continues to evolve, addressing new challenges and striving to balance competing objectives for a resilient and sustainable energy future. This article examines the concept and importance of energy security and analyses its status in the EU and Lithuania. It provides an overview of EU energy security policy, including the main guidelines and objectives. It discusses the EU's political strategy for energy security and EU legislation as an essential tool for ensuring energy security.*

The article highlights energy security problems in Lithuania, focusing on the most pressing issue facing the country today – disconnection from the Russian and Belarusian electricity system (BRELL ring) and the synchronization of Lithuania's electricity grid with that of continental Europe, Additionally, it addresses the challenges and future perspectives for energy security, emphasizing the impact of geopolitical challenges and climate change policies on the energy sector.

Keywords: *Energy security, European Union, energy policy, Lithuanian energy security.*

Introduction

According to the Cambridge Dictionary, the term "security" is associated with the protection of persons, buildings, or a state against threats such as crime or attacks by foreign countries.[1] More generally, the term security is associated with the absence of risk.[2]

Traditional approaches to state security usually focus on military, political, economic, social, and environmental threats.[3] However, in recent decades, due to rapid technological developments and globalization, the list of threats to state security has been extended. Classical security theories define what security is and what sectors of security are at stake. The importance of energy sectors can be noted here, disruptions to which may cause severe consequences to society and the functioning of the state. This may warrant the inclusion of this sector in discussions about state security. Modern threats to state security are very diverse, and can threaten several sectors at once (e.g., cyber threats) or be linked to different security sectors (e.g., energy security).

Energy security refers to a country's ability to secure the energy resources necessary to sustain its national power without undermining its foreign policy and economic, social, and environmental goals. It is crucial to state and human security and has become an increasingly significant concept. Energy has always been pivotal in the growth and development of civilizations. Still, its importance in the everyday functioning and progression of society has never been as pronounced as it is today. Energy underpins economic activities, healthcare

[1] The Cambridge Dictionary, available from: https://dictionary.cambridge.org/dictionary/english/security?q=Security, accessed on August, 2024.
[2] Baldwin, D. A. (2018). The concept of security. In *National and International Security*. Routledge.
[3] Stone, M. (2009). Security according to Buzan: A comprehensive security analysis. *Security discussion papers series, 1*.

services, and the general operations of modern society, with global demand surging at an unprecedented rate. To ensure the seamless operation of societies and safeguard their citizens from disruptions and shortages, it is crucial to meticulously monitor and manage energy resources, addressing potential risks with secure and efficient strategies.[4]

This article aims to present the diverse definitions, frameworks, and aspects of energy security, to discuss the main issues of energy security in the EU and Lithuania, and to provide an overview of EU energy security policy**.**

The concept and importance of energy security

Energy security has long been a central issue in energy policy discussions: "In the 21st as well as in the 20th century, energy security policies focused on reducing risks to energy services which are vital for the functioning of modern nations."[5]

Contemporary literature on energy security reveals a broad spectrum of definitions, both theoretical and applied. A review of various studies shows that energy security remains a multifaceted and frequently debated subject. There is no uniform agreement among academics regarding its definition or elements. This lack of consensus is typical in the social sciences where multiple interpretations often coexist.

As a result, the literature presents a range of diverse interpretations of energy security. Scholars often emphasize different aspects, sometimes in opposition to one another, transforming energy policy discourse into a battleground for defining energy security and determining the most applicable methodologies for various scenarios.[6]

It's generally accepted that energy security's interpretation varies with context and stakeholder perspectives. The myriad definitions of energy security are influenced by the global variations in energy infrastructure, economic landscapes, and governmental policies. This variability is justified for several reasons: energy systems are not uniform worldwide, each presenting unique security issues. Additionally, the scope of "energy security" often expands to encompass related policy issues like energy equity, environmental sustainability, and national energy autonomy. Therefore, the definitions crafted by theorists and practitioners alike are reflections of their specific circumstances and viewpoints. According to B. W. Ang, W. L. Choong and T. S. Ng, "the definition of energy security is contextual and dynamic in nature. The scope of energy security has also expanded, with a growing emphasis on dimensions such as environmental sustainability and energy efficiency."[7] Modern literature presents a variety of both conceptual and operational definitions of energy security. When reviewing individual publications, one can get the impression that energy security is a controversial concept, to say the least. There is no unanimity among authors with regard to the theoretical framework or the components of this notion. However, the issue of diversity of views is quite typical in social sciences and should not be taken negatively.

Current literature on energy policy provides a wide spectrum of definitions of energy security, which appear to explain the problem more precisely and comprehensively than

[4] Paravantis, J. A., & Kontoulis, N. (2020). Energy security and renewable energy: a geopolitical perspective. In *Renewable energy-resources, challenges and applications*. IntechOpen., p. 20

[5] Pachauri, S., & Cherp, A. (2011). Energy security and energy access: distinct and interconnected challenges. *Current Opinion in Environmental Sustainability*, *3*(4), 199-201.

[6] Ayoo, C. (2020). Towards Energy Security for the Twenty-First Century. IntechOpen. doi: 10.5772/intechopen.90872

[7] Ang, B. W., Choong, W. L., & Ng, T. S. (2015). Energy security: Definitions, dimensions and indexes. *Renewable and sustainable energy reviews*, *42*, 1078.

competing approaches. Hence, literature is overwhelmed by the diversity of perspectives for explaining energy security. Most authors dealing with the issue of energy security expose its different aspects while standing in opposition to competing concepts. As a result, literature that addresses the problems of energy policy is becoming a platform for debates on the essence of energy security and the applicability of its various approaches to individual situations.

The diversity in perceiving energy security is influenced by a considerable diversity in the global scale of energy systems, economic conditions and public policies implemented under different political systems. This diversity of conditions causes a great variety of risks to which energy systems are exposed. As a result of these conditions, the concepts of energy security adopted by individual authors reflect different contexts and perspectives assumed by their creators.

Energy security priorities and policies vary between countries. Different interpretations of energy security can also arise when the term is used by those who aim to elevate the importance of other policy agendas by framing them as issues of "energy security." These efforts underscore the importance of separating the discussion of energy security as a concept from normative and empirical debates about climate change mitigation, energy poverty reduction, and other energy policy goals, regardless of how valid these agendas may be.

Energy security refers to the relationship between a nation's security and its access to natural resources for energy consumption, distinct from household energy insecurity.[8] The importance of the security of energy sector can be underscored by the fact that "in the 21st century, one of the key drivers of most economies in countries throughout the world is energy."[9] The modern world depends on a vast energy supply to power everything from transportation to communication and healthcare systems. In the industrial world, producing one kilocalorie of food requires an investment of ten kilocalories of oil and gas energy. This energy is used in fertilizers, pesticides, packaging, transportation, and farm equipment. Energy is vital to a country's national security, as it fuels its economic engine.

Energy security is mainly a concern at the national level, while energy access issues are more prevalent at the household level. However, these two levels are interconnected. For instance, inadequate access to energy can drive governments to invest in additional infrastructure and secure fuel supplies, which may be seen as an extra burden on energy security. Conversely, disruptions in affordable energy access can threaten political and economic stability. As a result, both energy security and energy access are linked through complex financial, economic, and policy frameworks.

Access to affordable energy is crucial for the functioning of modern economies, yet the unequal distribution of energy resources across countries creates significant vulnerabilities. International energy relations have both facilitated globalization and contributed to energy security concerns and vulnerabilities.

Some authors describe energy security as the "reliable and adequate supply of energy at reasonable prices."[10] The concept of reliable and adequate supply is quite clear: it refers to an uninterrupted flow of energy that fully satisfies the demands of the global economy. However, the notion of reasonable prices is more complex, as it evolves over time and varies in perception

[8] Pranevičienė, B., & Vasiliauskienė, V. (2019). Hybrid threats to energy security: perspectives of international law. *Czech yearbook of public & private international law. Praha: Czech Society of International Law, 2019, vol. 10. ISBN 9788087488348.*

[9] Bilan, Y., Strielkowski, W., Karbach, R., & Mentel, G. (2017). Secure development of country and competitiveness issues: Case of Germany's energy security. *Journal of Security and Sustainability Issues*, 330.

[10] Bielecki, J. (2002). Energy security: is the wolf at the door?. *The quarterly review of economics and finance*, *42*(2), 237.

between energy producers and consumers. Generally speaking, it implies that prices are based on costs and are set by market dynamics.

Other authors discuss energy security in terms of the four A concepts: availability, accessibility, affordability, and acceptability.[11] The concept of the four As has become a foundational framework in contemporary energy security studies. Initially, the focus was primarily on two aspects: availability and affordability. Over time, accessibility and acceptability were incorporated into the broader discourse on energy security. The full framework of the four As seems to have been adapted from other fields, such as education.[12] healthcare, and human rights, where similar models were used.

However, in the context of energy security, the four As describe characteristics of energy systems rather than human values. While they are certainly connected to political, economic, and social priorities, the literature that draws on the four As framework does not explore these connections. This is more than just a formal oversight – it represents a significant gap, because without identifying the values that need protection and their relationship to energy systems, it becomes difficult to address the critical policy question: Which energy security systems should be protected? This issue is crucial for advancing energy security studies beyond the foundational insights of the last century. Earlier studies on energy security were based on a clear, albeit implicit, link between national values like political independence and territorial integrity and specific energy systems.

The four as also do not specifically address the threats to energy security. Public service policies, including those for energy, typically focus on achieving desired standards, such as expanding access to energy or healthcare, or on maintaining these standards through the most effective methods, like unbundling electricity generation and transmission to boost competitiveness. In contrast, energy security policies focus on safeguarding already established standards. Consequently, energy security concerns are largely driven by experiences of disruptions and perceptions of risks. For instance, classic energy security studies did not arise from the growth and evolution of energy systems but from disruptions to existing systems.

Recently, some authors have proposed insights regarding different aspects of the energy security concept, highlighting the low vulnerability of vital energy systems.[13] This approach paves the way for the detailed exploration of vulnerabilities as a combination of exposure to risks and resilience and for insights into the links between vital energy systems and critical social functions.

The International Energy Agency proposed that energy security be defined as “reliable and affordable access to all fuels and energy sources.”[14] Thus, energy security is understood as the uninterrupted availability of energy sources at an affordable price. The International Energy Agency emphasizes two key dimensions of energy security:

1. Long-term Energy Security: This involves timely investments to supply energy in line with economic developments and environmental needs. It focuses on the sustainability of energy supply over an extended period, ensuring that the energy system can evolve to meet future demands.

[11] Cherp, A., & Jewell, J. (2014). The concept of energy security: Beyond the four As. *Energy policy*, *75*.
[12] Pranevičienė, B., & Pūraitė, A. (2010). Right to education in international legal documents. *Jurisprudencija*, *121*(3).
[13] Jewell, J., Cherp, A., & Riahi, K. (2014). Energy security under de-carbonization scenarios: An assessment framework and evaluation under different technology and policy choices. *Energy Policy*, *65*, 745.
[14] International Energy Agency: Energy security - Reliable, affordable access to all fuels and energy sources, Energy security – Topics – IEA (2022), available from : https://www.iea.org/topics/energy-security, accessed 6 August 2024.

2. Short-term Energy Security: This aspect addresses the ability of the energy system to react promptly to sudden changes in the supply-demand balance, such as disruptions caused by natural disasters, geopolitical conflicts, or market fluctuations.[15]

The International Energy Agency stresses that energy security is a dynamic concept, constantly evolving in response to changes in the energy landscape, technological advancements, and shifts in global and regional geopolitics.

The World Energy Council introduced the concept of the "energy trilemma,"[16] which refers to the challenge of balancing three critical and often competing objectives in energy policy and strategy:

1. **Energy Security**: Ensuring a reliable and stable supply of energy to meet current and future demands. This involves minimizing risks of supply disruptions, whether due to geopolitical tensions, natural disasters, or other factors.
2. **Energy Equity**: Providing affordable and accessible energy for all, ensuring that everyone has access to the energy needed for basic needs, economic activities, and social development. This aspect emphasizes the importance of fairness and inclusivity in energy access.
3. **Environmental Sustainability:** Reducing the environmental impact of energy production and consumption, particularly in terms of greenhouse gas emissions and other pollutants. This involves transitioning to cleaner, renewable energy sources and improving energy efficiency to mitigate climate change and preserve natural ecosystems.

Balancing these three elements is challenging because actions taken to improve one aspect can often negatively impact the others. For example, prioritizing energy security by relying heavily on fossil fuels may compromise environmental sustainability, while focusing on sustainability might increase costs and impact energy equity. The "energy trilemma" thus represents the complex trade-offs and decision-making required to achieve a balanced energy strategy that addresses all three objectives.

The World Energy Council has used the energy trilemma framework extensively in its reports and assessments to evaluate and guide national and global energy policies.[17, 18, 19, 20, 21] The World Energy Trilemma Index has been prepared annually since 2010 by the World Energy Council, and has become a widely recognized tool in the energy sector for understanding and addressing the trade-offs and synergies among these three critical objectives.

When the World Energy Trilemma framework was first devised some 15 years ago, energy security was focused on concerns about supply-side shocks, access to scarce resources, strategic reserves, energy efficiency, and exposure to commodity prices. The concept of energy security now extends to a variety of new challenges, including the prospect of demand-driven

[15] International Energy Agency: Energy security - Reliable, affordable access to all fuels and energy sources, Energy security – Topics – IEA (2022), available from : https://www.iea.org/topics/energy-security, accessed 6 August 2024

[16] The Dilemma over the Trilemma, World Energy Council, available from: https://www.worldenergy.org/news-views/entry/the-dilemma-over-the-trilemma, accessed 6 August 2024.

[17] World Energy Trilemma Report 2024: Evolving with Resilience and Justice, (https://www.worldenergy.org /assets/downloads/World_Energy_Trilemma_2024_Full_Report.pdf?v=1721938251); accessed 6 August 2024.

[18] World Energy Trilemma Index: 2022 Report, The World Energy Council, available from: https://www.world energy.org/publications/entry/world-energy-trilemma-index-2022, accessed 6 August 2024.

[19] World Energy Trilemma Index: 2021 Report, The World Energy Council, available from: https://www.world energy.org/publications/entry/world-energy-trilemma-index-2021, accessed 6 August 2024.

[20] World Energy Trilemma Index: 2020 Report, The World Energy Council available from: https://www.world energy.org/publications/entry/world-energy-trilemma-index-2020, accessed 7 August 2024.

[21] World Energy Trilemma Index: 2019 Report The World Energy Council, available from: https://www.world energy.org/publications/entry/world-energy-trilemma-index-2019, accessed 7 August 2024.

energy shocks, exemplified by Europe's decision to move away from Russian gas imports in response to Russia's invasion of Ukraine. The new world of disruption-as-usual includes extreme weather events and issues beyond traditional oil and gas dependencies, such as data and technologies, critical minerals and metals, and new kinds of asymmetric threats to both physical and digital infrastructures.

Key issues of energy security in the EU and Lithuania

Countries have varying energy security goals based on their position in the energy market: producer and exporter nations focus on securing stable demand for their resources; consumer nations typically prioritize diversifying their energy sources to reduce dependence and enhance security; and transit states seek to capitalize on their strategic role as intermediaries, linking producers and exporters with their markets.[22] For consumer and transit countries, ensuring a stable supply of energy is crucial, while for producer and exporter countries, securing consistent demand is likely just as vital as maintaining a reliable supply.[23]

When it comes to European and Lithuanian energy security, it is important to recognize that their distinct characteristics are shaped by the geographic, political, and economic context. Dependence on external energy supplies should be stressed in terms of European and Lithuanian energy security.

Europe heavily relies on imported energy, particularly natural gas and oil, from outside the continent. Russia has historically been a major supplier, making Europe vulnerable to geopolitical tensions and supply disruptions. In 2021, the EU imported over 40% of its natural gas, 27% of its oil, and 46% of its coal from Russia, highlighting a critical reliance on a single supplier for energy needs.[24] This dependence has prompted strategic shifts, especially after the 2022 Russian invasion of Ukraine, which further exposed the risks of such reliance. "Russia's unjustified military aggression against Ukraine and its weaponisation of gas supplies have provoked an unprecedented energy crisis for the European Union. They have caused a sharp rise in energy prices and brought hardship for Europeans."[25] The EU has since implemented measures under the REPowerEU plan[26] to reduce its dependency on Russian fossil fuels, aiming for complete independence well before the end of the decade. This includes diversifying gas supplies, increasing LNG imports, and accelerating the transition to renewable energy sources.

The energy security of Europe and Lithuania is deeply intertwined with geopolitical issues, particularly with regard to Russia. The European response to crises such as the Russia-Ukraine war highlights the continent's vulnerability and the importance of diversifying energy sources and enhancing resilience against potential supply shocks. Following the invasion of Ukraine, European nations, heavily reliant on Russian oil and gas, responded by using less gas, securing extra supply at higher prices, temporarily increasing coal-fueled power generation, introducing binding EU-wide targets to fill gas storage, and bringing online record amounts of

[22] Luft, G., & Korin, A. (2009). Energy security: In the eyes of the beholder. *Energy security challenges for the 21st century: A reference handbook*, 6.
[23] Johansson, B. (2013). A broadened typology on energy and security. *Energy*, *53*.
[24] In focus: Reducing the EU's dependence on imported fossil fuels, European Commission, available from: https://commission.europa.eu/news/focus-reducing-eus-dependence-imported-fossil-fuels-2022-04-20_en, accessed 6 August 2024.
[25] EU Action to address the energy crisis, available from: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/eu-action-address-energy-crisis_en, accessed 6 August 2024.
[26] The REPowerEU plan, European Commission, available from: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en, accessed 6 August 2024.

renewable energy, as well as introducing obligatory energy-saving measures. While the spike in energy prices led to a cost-of-living crisis in many parts of Europe and other parts of the world, Europe's interconnected electricity markets ensured secure electricity supplies. A combination of demand-side measures, along with actions to quickly secure liquefied natural gas (LNG) supplies, resulted in Europe securing 95% gas storage by Q4 2022.[27]

The Russia-Ukraine war has intensified the focus on gas storage, while the surge in renewable energy adoption necessitates expanded storage capacity to synchronize generation with demand, both in the short term and for seasonal shifts. This intricate balancing act requires grid investment and digitalization as well as new measurements and indicators of system stability. The integration of diverse energy sources, which requires large-scale, adaptable, and integrated energy storage, underscores the significance of policies promoting advanced grid infrastructure and smart technologies to safeguard system stability. Electricity market reforms, while seen primarily as responses to the need for energy equity, are also introducing time-based tariffs to support the balancing act for grid reliability.

Overall, the European energy security is defined by the continent's efforts to balance the need for reliable, affordable energy with the imperative to reduce carbon emissions and the challenges posed by geopolitical dependencies

As regards Lithuania's energy security peculiarities, it is noted that in addition to the energy security threats common to the EU as a whole, Lithuania has specific challenges in this area.

Since 1983, when the Ignalina Nuclear Power Plant and the Kruonis pumped storage power plant started operating in Lithuania, Lithuania has become a member of the so-called BRELL system,[28] named after the first letters of the names of the participating countries: Belarus, Russia, Estonia, Latvia, and Lithuania.

When the Baltic States regained their independence in 1990, they also took over the electricity infrastructure in their territories. However, the management of this infrastructure continued to be run from Moscow. As the Baltic States sought EU and NATO membership, it was important for Russia to maintain their dependence, at least in the energy sector. This led to the BRELL Treaty, which provided for a common management structure and working regulations for the five participating countries' energy networks.

From 1990 to 2001, the Lithuanian electricity sector, although de facto integrated into the Russian energy system, was formally legally independent. Under the BRELL Treaty, which was signed in 2001, it became not only technically, but also legally obliged to comply with the decisions of the Russian dispatch center in Moscow.[29] The BRELL agreement set up technical rules defining the participation in the transmission system, and agreement is automatically renewed every year absent a notice of withdrawal from one of the parties by August, six months before expiration.

One of the key strategic objectives in the energy sector of Lithuania is the synchronization of Lithuania's electricity grid with that of continental Europe, disconnecting it from the Russian

[27] World Energy Trilemma Report 2024: Evolving with Resilience and Justice, available from: https://www.worldenergy.org/assets/downloads/World_Energy_Trilemma_2024_Full_Report.pdf?v=1721938251, accessed 6 August 2024.

[28] Sekmokas. A, Politinė BRELL sutartis (2020), available from: https://www.lrt.lt/naujienos/pozicija/679/1196957/arvydas-sekmokas-politine-brellsutartis?gad_source=1&gclid=Cj0KCQjwzva1BhD3ARIsADQuPnXytpBF44rP6HMOpBa31r1-lr_AncRRfV83eiOsv7aiwHibBh8PAFkaAlh1EALw_wcB, accessed 1 August 2024.

[29] Juozaitis, J, Baltic States' Synchronisation with Continental European Network: Navigating the Hybrid Threat Landscape, NATO Energy Security Centre of Excellence Report (2021), available from: https://www.enseccoe.org/publications/baltic-states-synchronisation-with-continental-european-network-navigating-the-hybrid-threat-landscape/, accessed 6 August 2024.

and Belarusian electricity systems (the BRELL ring). This project would ensure greater energy security and stability and reduce geopolitical dependence.

The first steps towards independence from BRELL were taken in Lithuania in 2007, when the Baltic countries adopted a strategic project to connect to the Continental European grid. In June 2018, guidelines for the synchronization of the national electricity grids with the European grid were signed between the Baltic States and the European Commission (EC) and Poland.[30]

Figure 1. The BRELL power ring
Source: Kauno diena, 2022[31]

Lithuania, Estonia, and Latvia planned to disconnect from the Russian BRELL system in 2025, because BRELL has repeatedly become a tool of Moscow's political power throughout its history. However, in 2022, in response to rising geopolitical risks in the region, Lithuania accelerated its efforts to disconnect its electricity network from the BRELL system and urged Latvia and Estonia to advance their synchronization timelines. Although Latvia and Estonia declined Lithuania's proposed deadline of the first half of 2024, a compromise was reached to complete the project by February 2024.[32]

In 2014, the energy situation changed with the construction of electricity interconnections to Sweden and Poland. Lithuania had the opportunity to withdraw from the Russian electricity

[30] Political Roadmap on the synchronisation of the Baltic States1 electricity networks with the Continental European Network via Poland, available from: https://energy.ec.europa.eu/system/files/2019-10/c_ 2018 _4050_en_annexe_acte_autonome_nlw2_p_v2_0.pdf, accessed 12 August 2024.
[31] Matutis. V, Baltijos jūra išlaisvino nuo priklausomybės. Kauno diena, (2022), available from: https://m.kauno .diena.lt/naujienos/klaipeda/miesto-pulsas/baltijos-jura-islaisvino-nuo-priklausomybes-1085645, accessed 10 August 2024.
[32] Baltijos šalys oficialiai pranešė apie pasitraukimą iš Rusijos elektros sistemos, Verslo žinios (2024), available from: https://www.vz.lt/pramone/energetika/2024/07/16/baltijos-saliu-operatoriai-rengiasi-pranesti-apie-pasitraukima-is-brell, accessed 20 July 2024.

system and synchronize with continental Europe. At the same time, commercial opportunities were created, both for importing and exporting electricity from the EU.

On 22 April 2023, Lithuania conducted an isolated system test and temporarily disconnected from BRELL.[33] After the successful test, Lithuania put pressure on Latvia and Estonia to accelerate synchronization with the continental European grid.

Baltic desynchronization from the IPS/UPS system and synchronization with the Continental Europe Network (CEN) have been considered a strategic priority for EU energy policy since 2013, leading to the inclusion of some of the necessary grid infrastructure reinforcements into the list of Projects of Common Interest (PCIs) eligible for EU funding.[34] "The desynchronisation of the Baltic States' electricity grid from these systems and the synchronisation with the continental European network (CEN) is an essential political priority for the achievement of the Energy Union."[35] The relevant grid reinforcements were included in the third EU list of Projects of Common Interest (PCIs) adopted by the Commission on 23 November 2017.[36] PCIs are intended to help the EU achieve its energy policy and climate objectives: affordable, secure and sustainable energy for all citizens.

The European Commission is actively working to ensure significant advancements in the synchronization process, providing support to the Baltic States to fulfill this strategic goal. It focuses on rolling out critical energy projects that will connect these states more closely with European grids, thereby resolving the issues contributing to the energy isolation in this region. This goal was once again stated by the European Commission on 23 November 2017 in its Communication "on strengthening Europe's energy networks."[37]

It should be noted that the energy security of Europe and Lithuania is not only related to the production, supply, and distribution of electricity, but also to the sources and routes of gas supply. "A key part of ensuring secure and affordable supplies of energy to Europeans involves diversifying supply routes. This includes identifying and building new routes that decrease the dependence of European Union countries on a single supplier of natural gas and other energy resources."[38]

Although Lithuania has less than 100 kilometers of sea frontage, this area has more energy independence than the rest of the country thanks to the Būtingė terminal on the Baltic Sea. The Būtingė oil terminal, with a buoy at sea, was launched at the beginning of Lithuania's independence. Construction was long and difficult, but time has shown that it was worth it.

[33] Po istorinio bandymo: rusai šantažo kortos nebeturi, bet yra kita problema, 15min (2023), available from: https://www.15min.lt/verslas/naujiena/energetika/po-istorinio-bandymo-rusai-santazo-kortos-nebeturi-bet-yra-kita-problema-664-2043100, accessed 16 July 2024.

[34] European solidarity on Energy: Synchronization of the Baltic States' electricity network with the European system strengthens security of supply" (2018), available from: https://ec.europa.eu/commission/press corner/detail/de/MEMO_18_4285, accessed 16 July 2024.

[35] European solidarity on Energy: Synchronisation of the Baltic States' electricity network with the European system strengthens security of supply, European Commission, available from: https://ec.europa.eu/commission /presscorner/detail/en/IP_18_4284, accessed 8 August 2024.

[36] Commission Delegated Regulation (EU) 2018/540 of 23 November 2017 amending Regulation (EU) No 347/2013 of the European Parliament and of the Council as regards the Union list of projects of common interest, available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R0540, accessed 6 August 2024.

[37] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Communication on strengthening Europe's energy networks, available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2017:718:FIN, accessed 10 August 2024.

[38] Diversification of gas supply cources and routes, European Commission, available from: https://energy.ec. europa.eu/topics/energy-security/diversification-gas-supply-sources-and-routes_en, accessed 6 August 2024.

Nothing much has changed in Western Europe's relations with Russia over the decades. In recent years, the Russians have been explaining that there are technical problems with the Nord Stream 1 pipeline in connection with the supply of gas to Germany. Lithuania has built the Būtingė oil terminal with a buoy at sea, and can successfully ship oil from anywhere in the world to the refinery near Mažeikiai.

Another symbol of Lithuania's independence from Russia is the liquefied natural gas terminal in Klaipėda. Like the Būtingė oil terminal, it was built over a long period of time, with much debate in both Klaipėda and Vilnius. The location of the terminal has its drawbacks, because it is not at the front of the port – not in front of the port gates, as is usual in many countries – but at the very end of the port.

There have been many suggestions that ships going to the Klaipėda LNG terminal will restrict shipping and create additional obstacles. Although the Klaipėda LNG terminal has been operating at full capacity for some time now, there have been no major obstacles to the passage of gas carriers through the port. The importance of the Klaipėda LNG terminal has become particularly apparent in this period of Russia's war in Ukraine.

In summary, the strategic objectives of both Europe and Lithuania in the energy sector are to increase energy independence. Lithuania is actively seeking to reduce its dependence on imported energy, especially from Russia. Strategic projects implemented in recent years, such as the LNG terminal in Klaipėda and electricity interconnections with Sweden (NordBalt) and Poland (LitPol Link), have helped to diversify the country's sources of energy supply and to increase energy independence.

The Harmony Link electricity cable across the Baltic Sea from Poland to Lithuania still needs to be built to enable the Baltic countries to move away from their last remnant of energy dependence on Russia. This would create a new Baltic electricity ring through Poland to Western Europe.

The Baltic Sea route needed for this cable has already been explored. The Harmony Link cable will run from the Zarnowiec electricity substation in Poland to Šventoji, where the line will then run overland to Darbėnai. A 330 kV electricity switching station will be installed there. It will be connected via Bitėnai to the Kruonis Hydroelectric Power Plant, Klaipėda and Latvia's Grobin. [39]

The Darbėnai electricity distribution station will also be connected to wind farms planned for the Baltic Sea in the future. This would essentially mean that Lithuania's electricity supply, which for decades has been based at the Ignalina nuclear power plant, will move to the Baltic Sea when it is closed.

The working documents for the construction of the electricity switchyard in Darbėnai are currently being finalised. "Litgrid, which is carrying out the project together with the Poles, has launched a tender for the expert examination of the technical documents for the construction of the Darbėnai switchyard."[40]

Given the geopolitical situation, in particular Russian aggression in Ukraine, Lithuania continuously strives to increase its energy resilience and preparedness for potential supply disruptions. This includes not only strengthening infrastructure, but also stockpiling strategic energy resources and international cooperation with EU partners.

[39] Pryšmantas V., Polish-Lithuanian power cable to be built alongside Rail Baltica tracks – minister, https://www.lrt.lt/en/news-in-english/19/2159251/polish-lithuanian-power-cable-to-be-built-alongside-rail-baltica-tracks-minister, accessed 6 August 2024.

[40] Litgrid": Darbėnuose pradedama statyti 330 kV skirstykla, https://www.delfi.lt/verslas/energetika/litgrid-darbenuose-pradedama-statyti-330-kv-skirstykla-93650643, accessed 6 August 2024.

An overview of EU energy security policy

In May 2007, the European Council developed a coordinated energy and environment policy, which stressed the challenges in energy sector:

"Energy is essential for Europe to function. But the days of cheap energy for Europe seem to be over. The challenges of climate change, increasing import dependence and higher energy prices are faced by all European Union members. Moreover the interdependence of European Union Member States in energy, as in many other areas, is increasing – a power failure in one country has immediate effects in others. Europe needs to act now, together, to deliver sustainable, secure and competitive energy. In doing so the European Union would return to its roots. In 1952 with the Coal and Steel Treaty and 1957 with the Euratom Treaty, the founding Member States saw the need for a common approach to energy. Energy markets and geopolitical considerations have changed significantly since then. But the need for European Union action is stronger than ever. Without this, the European Union's objectives in other areas, including the Lisbon Strategy for growth and jobs and the Millennium Development Goals, will also be more difficult to achieve. A new European Energy Policy needs to be ambitious, competitive and long-term – and to the benefit of all Europeans."[41]

In 2009, the Treaty of Lisbon[42] introduced a new legal basis for shared competencies in the field of energy and climate. Since then, the EU has been entitled to take measures to ensure the security of energy supplies by diversifying routes and suppliers (particularly given the historically high dependence on Russia). This action also aims to reduce market dominance and supplier concentration and keep energy affordable for European consumers by reforming, liberalizing and integrating gas and electricity markets. The EU's understanding of energy security is primarily supply-centered and quintessentially market-orientated. Along with energy supply reliability and affordability, environmental sustainability has been more recently added as a third pillar, which is also in line with global trends.

In 2014, the EU Energy Security Strategy was issued.[43] This strategy was developed in response to the Ukraine crisis and aims to reduce dependence on external energy suppliers, diversify energy sources, and increase energy efficiency across the EU. The reasons behind the Energy Security Strategy were as follows:

"The EU imports 53% of the energy it consumes. Energy import dependency relates to crude oil (almost 90%), to natural gas (66%), and to a lesser extent to solid fuels (42%) as well as nuclear fuel (40%). Energy security of supply concerns every Member State, even if some are more vulnerable than others. This is valid in particular for less integrated and connected regions such as the Baltic and Eastern Europe. The most pressing energy security of supply issue is the strong dependence from a single external supplier. This is particularly true for gas, but also applies to electricity: Six Member States depend from Russia as single external supplier for their entire gas imports and three of them use natural gas for more than a quarter of their total energy needs. In 2013 energy supplies from Russia accounted for 39% of EU natural gas imports or 27% of EU gas consumption; Russia exported 71 % of its gas to Europe with the

[41] Communication from the Commission to the European Council and the European Parliament: An Energy Policy for Europe, 2007, available from: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0001:FIN:EN:PDF, accessed 6 August 2024.

[42] Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007, available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A12007L%2FTXT, accessed 6 August 2024.

[43] Communication from the Commission to the European Parliament and the Council European Energy Security Strategy, available from: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52014DC0330), accessed 6 August 2024.

largest volumes to Germany and Italy; for electricity, three Member States (Estonia, Latvia and Lithuania) are dependent on one external operator for the operation and balancing of their electricity network."[44]

The 2015 Energy Union Package is the most comprehensive attempt to define objectives and an instrument for a holistic approach to energy security.[45] It asserts that the objective of a resilient Energy Union, with a strong emphasis on ambitious climate policy, is to provide EU consumers, including households and businesses, with energy that is secure, sustainable, competitive, and affordable.[46] The core of the EU's energy policy is built on a triangle of supply security (reliability), sustainability (climate), and competitiveness (affordability), with the EU viewing these elements as mutually reinforcing. However, by treating all these goals as equally important, the EU has struggled to set clear priorities and effectively address the trade-off between climate objectives and supply security.

In 2019, the EU revamped its energy policy framework to facilitate the transition from fossil fuels to cleaner energy sources, with the specific aim of meeting its commitments under the Paris Agreement[47] to reduce greenhouse gas emissions.[48] The European Green Deal adopted by the European Commission in 2019 must be mentioned here.[49] While primarily focused on sustainability, the Green Deal also includes measures that enhance energy security by promoting renewable energy, reducing dependency on fossil fuels, and improving energy efficiency.

In 2019, Regulation 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC[50] was adopted with the aim of laying "down rules for cooperation between Member States with a view to preventing, preparing for, and managing electricity crises in a spirit of solidarity and transparency and in full regard for the requirements of a competitive internal market for electricity"[51].

Recent years have seen significant changes driven by EU energy policy, marked by a substantial reduction in the use of the most polluting fuels as consumption has increasingly shifted toward natural gas and renewables. Although the EU's renewable energy production has

[44] Ibid.
[45] Strambo, C., & Nilsson, M. (2018). The Energy Union: a coherent policy package?. In *Handbook of the International Political Economy of Energy and Natural Resources*. Edward Elgar Publishing.
[46] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:80:FIN, accessed 6 August 2024.
[47] The Paris agreement, United Nations, available from: https://unfccc.int/process-and-meetings/the-paris-agreement, accessed 10 August 2024.
[48] Clean energy for all Europeans package, European Commission, available from: https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en, accessed 12 August 2024.
[49] The European Green Deal, available from: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en, accessed 7 July 2024.
[50] Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC, available from: https://eur-lex.europa.eu/eli/reg/2019/941/oj), accessed 16 July 2024.
[51] Regulation - 2019/941 - EN - EUR-Lex. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.158.01.0001.01.ENG&toc=OJ:L:2019:158:TOC

grown significantly, gas production has decreased, resulting in a greater dependence on gas imports.[52]

The sharp rise in energy prices and heightened volatility in recent years have already sparked calls to reduce our reliance on energy imports. Russia's invasion of Ukraine has intensified this discussion, leading to significant strategic policy shifts within the EU .

In 2021, the EU sourced over 40% of its natural gas, 27% of its oil, and 46% of its coal from Russia. Energy imports constituted 62% of the EU's total imports from Russia, amounting to €99 billion. Although this marks a significant decrease from 2011, when energy accounted for nearly 77% of EU imports from Russia (valued at €148 billion), the EU is intensifying efforts to reduce its reliance on Russian energy.[53]

To enhance energy security, Europe has focused on diversifying its energy sources and supply routes[54]: this includes increasing imports from different countries, investing in liquefied natural gas (LNG) infrastructure, and developing renewable energy sources to reduce reliance on fossil fuels.

In 2022, the European Commission introduced the REPowerEU plan,[55] which outlines strategies to drastically cut Russian gas imports from the 2021 level of 155 billion cubic meters (bcm) by the end of the year, and to achieve full independence from Russian fossil fuels well before the end of the decade. The plan focuses on diversifying energy supplies, reducing demand, and significantly increasing the production of renewable energy within the EU. [56]

To summarize, the EU has developed a comprehensive energy security policy focused on ensuring stable, sustainable, and affordable energy supply for its member states. The main aspects of the EU's energy security policy are:

1. Diversification of energy sources and supply routes, which means the reducing of dependence on a single supplier or route by diversifying its energy sources and supply routes.
2. Integration of energy markets,[57] which means the creation an integrated and interconnected energy market among its Member States. This integration enhances resilience by allowing for the free flow of energy across borders, ensuring that no single country is overly dependent on one supply source.
3. Transition to renewable energy, which means reducing dependence on imported fossil fuels and enhancing energy independence.
4. Energy efficiency initiatives, which means reducing energy consumption through efficiency measures and lowering overall demand for energy, which in turn enhances security by reducing the need for imports.
5. Preparedness and resilience, which means the implementation of EU frameworks like the Security of Gas Supply Regulation to ensure that Member States are prepared to manage

[52] In focus: Reducing the EU's dependence on imported fossil fuels (2022), Brussels, available from: https://commission.europa.eu/news/focus-reducing-eus-dependence-imported-fossil-fuels-2022-04-20_en, accessed 13 July 2024.
[53] Ibid
[54] Diversification of gas supply sources and routes, European Commission, available from: https://energy.ec.europa.eu/topics/energy-security/diversification-gas-supply-sources-and-routes_en, accessed 10 July 2024.
[55] 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 REPowerEU Plan, available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN&qid=1653033742483, accessed August 2024.
[56] REPowerEU, Affordable, secure and sustainable energy for Europe, European commission, available from: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en, accessed August 2024.
[57] Electricity market design, European Commission, available from: https://energy.ec.europa.eu/topics/markets-and-consumers/electricity-market-design_en, accessed 10 July 2024.

energy supply disruptions. This regulation requires actions such as maintaining minimum gas storage levels and promoting regional cooperation to effectively address crises.

Conclusions

Energy security remains a fundamental issue in energy policy discussions, characterized by a wide range of definitions and interpretations that reflect the complex and dynamic nature of the concept. The lack of consensus among scholars and policymakers highlights the multifaceted challenges of energy security, which is influenced by diverse energy systems, economic conditions, and political environments across the globe.

Recent literature emphasizes the evolving understanding of energy security, incorporating broader dimensions such as environmental sustainability, energy efficiency, and energy equity. These new perspectives underscore the interconnectedness of energy security with other critical issues like climate change, energy poverty, and geopolitical stability.

The concept of energy security has expanded beyond traditional concerns about the uninterrupted supply of energy at reasonable prices to include considerations of resilience, adaptability, and the ability to manage risks and vulnerabilities in an increasingly complex global energy landscape. This shift is evident in frameworks like the "four As" of energy security – availability, accessibility, affordability, and acceptability – as well as the "energy trilemma," which balances energy security, equity, and environmental sustainability.

Energy security in Europe and Lithuania is heavily influenced by geographic, political, and economic factors. Europe's reliance on external energy supplies, particularly from Russia, has exposed vulnerabilities, prompting strategic shifts. The 2022 Russian invasion of Ukraine highlighted the risks associated with dependence on a single supplier and accelerated efforts to diversify energy sources and reduce reliance on Russian fossil fuels through initiatives like the REPowerEU plan.

Europe's response to recent energy crises, including the surge in renewable energy adoption and increased energy storage capacities, underscores the need for advanced grid infrastructure and smart technologies. The interconnected nature of European electricity markets has helped secure supplies, but ongoing efforts are needed to balance energy security with environmental goals and geopolitical challenges.

Lithuania has made significant strides towards energy independence, notably by seeking to disconnect from the BRELL energy ring and synchronize its electricity grid with continental Europe. Projects like the Klaipėda LNG terminal and electricity interconnections with Sweden and Poland have diversified Lithuania's energy sources and reduced its dependency on Russian energy. The planned Harmony Link cable represents a further step towards reducing energy reliance on Russia and integrating the Baltic States into the European energy network.

Overall, both Europe and Lithuania are actively pursuing strategies to enhance energy security, reduce dependence on specific suppliers, and integrate more diverse and sustainable energy sources. These efforts reflect a broader trend towards achieving greater energy resilience in response to evolving geopolitical and economic challenges.

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