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Energy policy and economic security: a comparison of Europe and Asia

Abstract: The aim of this study is to analyze the impact of energy policy on economic security in European and Asian countries. The methodology includes a comparative analysis of energy policies across Europe and Asia, with a content analysis of legislative frameworks, statistical analysis of energy data, and case studies to assess the effectiveness of energy strategies in ensuring economic security. The key aspects of energy strategies, such as dependence on imported energy resources, the development of renewable energy, and energy efficiency, and how these factors influence economic stability, were compared. The study explores the experiences of European countries like Germany and France, Asian nations such as China and Japan, and Uzbekistan, which is actively improving its infrastructure. It was highlighted that the role of political decisions, investment in advanced technologies, and international cooperation plays in ensuring energy stability. Countries with diverse energy sources show greater resilience to economic crises and external political pressures compared to those with lower energy independence. The experiences of European, Asian countries, and Uzbekistan demonstrate that energy policy is a critical factor in economic security. Reliable and accessible energy sources are essential for stable economic growth. It was concluded that countries adopting innovative approaches in the energy sector, particularly through renewable energy development and energy-saving measures, can achieve

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long-term economic security. The results highlight the significance of adopting a strategic approach to energy policy as a crucial element in ensuring economic security in a globalized environment.

Keywords: strategy, resources, investments, energy efficiency, energy supply

Introduction

Energy policy in the context of a globalized economy is a key factor influencing not only the economic stability of individual countries but also their ability to adapt to shifting global market conditions. The impact of energy policy on economic security is particularly significant amidst energy crises, and climate change, as these factors exacerbate vulnerabilities in energy supply and economic stability. Comparing strategies in Europe and Asia provides insights into different approaches to achieving energy stability and long-term economic security. European countries traditionally focus on diversifying energy sources, advancing green technologies, and reducing emissions. In contrast, countries like China and India in Asia often prioritize rapid economic growth by relying on traditional energy resources such as coal and oil. Studying energy policies in the context of economic security reveals how nations address energy challenges and ensure economic stability on a global scale.

The link between energy policy and economic security, particularly in light of energy problems and climate change, is the scientific issue this study attempts to solve. Many nations still struggle to strike a balance between environmental goals and energy security, even in the face of growing global concerns about sustainability and energy independence (Torepashovna et al. 2022). The study looks at how various energy strategies, like using renewable energy and diversifying energy sources, affect a country's economic stability.

Research by Bigerna et al. (2023) emphasizes that energy security plays a central role in development and is shaped by strategies for diversifying energy sources and adopting innovative technologies. Key elements include the sustainable use of renewable resources and the adoption, which are widely implemented in European countries. On the other hand, Bocquillon and Maltby (2020) highlight Europe's energy policy focus on meeting growing energy demands, often requiring compromises between traditional and renewable energy sources.

Analysis by Mahmudul and Wahid (2020) shows that Asian countries aim to integrate environmentally friendly technologies and reduce carbon emissions. This approach not only enhances energy independence but also strengthens environmental security. Meanwhile, European strategies focus on expanding infrastructure and responding swiftly to global changes in energy demands, which necessitate substantial investment in traditional energy sources like coal and oil. Both regions are developing strategies to boost resilience against external economic and environmental challenges.

Studies on European energy policies by researchers such as Brodny and Tutak (2023) and Dolata (2022) highlight sustainable development, renewable energy integration, and carbon emission reduction as key goals. Achieving these objectives requires effective international coordination and active collaboration between the public and private sectors. Can and Korkmaz (2019) examine the connection between economic growth and the use of renewable energy, examining the effects of the transition to renewable energy on national economies. The authors highlight the significance of incorporating renewable energy sources into economic strategies for sustainable growth and offer empirical evidence of the beneficial effects of renewable energy adoption on long-term economic development.

Examining different models of energy security in these regions also underscores the importance of adapting energy strategies to global market changes. Fu et al. (2021) note that in Asia, energy security issues are closely tied to economic growth and maintaining global competitiveness. The region invests heavily in energy infrastructure, incorporating both traditional and new energy sources. Conversely, research by Dulian and Klochko (2023) points to Europe's shift toward long-term sustainability, emphasizing green technologies and innovative solutions as critical to securing economic stability.

The novelty of this study lies in its comparative approach to analyzing energy policy and economic security across both European and Asian countries, regions with distinct energy challenges and strategies. Through an analysis of the relationship among energy diversification, adoption of renewable energy, and economic resilience, this study provides fresh perspectives on how nations with different degrees of energy independence deal with the challenges posed by climate change and energy crises. The inclusion of Uzbekistan, a fast-developing country with a distinctive energy strategy, also brings a new viewpoint to the current discussion on energy policy and its effects on long-term economic stability.

The objective of this study was to analyze energy policy and economic security through a comparison of European and Asian approaches. The study set the following tasks:

1. Identify the main approaches to energy policy in Europe and Asia.
2. Compare energy security strategies adopted by countries in these regions.
3. Assess the effectiveness of energy strategies.

1. Materials and methods

The selection of Germany, France, China, Japan, and Uzbekistan for comparison is based on their diverse energy profiles, geopolitical and economic influence, and varied approaches to energy security. These countries represent a range of strategies, from a strong commitment to renewable energy in Germany and France, to a continued reliance on coal and gas in China and Uzbekistan, and Japan's focus on hydrogen and energy diversification. Their notable investments in energy infrastructure, such as renewable energy projects and nuclear energy, are

key to shaping their future energy security and economic resilience. Studying their policies offers valuable insights into how energy strategies impact national economic security, sustainability, and long-term development.

The study materials included essential legal frameworks, such as Germany's Renewable Energy Sources Act (EEG) (2023) and Energy Security Act (EnSiG) (1975), which provide the foundation for renewable energy development and increased energy independence. In France, the Energy and Climate Law (2019) was analyzed, focusing on carbon emission reductions and energy efficiency improvements. For China, China's new Energy Law (2024) and the Guiding Opinions on Vigorously Implementing the Renewable Energy Substitution Initiative, new renewable energy plan (Interesse 2024), were reviewed, highlighting strategic directions for increasing the share of renewables and modernizing infrastructure. In Japan, the Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities (2011) was examined for its role in the shift toward a more sustainable energy model, including expanding renewable energy use. In Uzbekistan, the Law of the Republic of Uzbekistan No. ZRU-539 "On the use of renewable energy sources" (2019) was studied, which addresses energy efficiency and the transition to environmentally friendly energy sources. These sources provided statistics and research findings that reflect the current challenges and achievements in the energy sectors of these countries. Additionally, empirical studies were reviewed to understand the practical application of legislation and its effects on national economies and energy systems.

The research methods included comparative analysis to identify similarities and differences in approaches to ensuring energy security across different countries. This method also evaluated the impact of these approaches on economic stability. The comparative analysis covered legal and economic tools used to address energy security challenges, such as expanding sources, advancing renewable, enhancing efficiency, and reducing dependency on external supplies.

To gain deeper insights into the effects of energy strategies, content analysis was used to examine the content of legislative acts, policy strategies, and regulatory documents. This method also explored changes in energy policies over time. Additionally, statistical analysis was employed to evaluate quantitative and qualitative indicators of energy strategy effectiveness and their impact on the resilience of national economies in the face of global challenges and changes.

2. Results

2.1. Key approaches to energy policy in Europe and Asia

Historical events have shaped the foundation of modern energy policy approaches in Europe and Asia, emphasizing energy security, technological development, and international cooperation.

In Europe, energy policy has been heavily influenced by the Industrial Revolution of the XVIII–XIX centuries when coal became the primary energy source. Later, in the XX century, the use of oil and natural gas expanded significantly, especially after World War II, aiding in the reconstruction of war-torn economies. The energy crisis of the 1970s marked a turning point, encouraging European countries to explore alternatives to oil imports and invest in sources of renewable energy (RES). In the 1990s, the adoption of the Kyoto Protocol further strengthened the environmental focus of the region's energy policies. In 2019, the European Union (EU) introduced the "Green Deal", a roadmap aimed at achieving carbon neutrality by 2050 (Bağlıtaş and Atik 2023).

In Asia, energy policy followed a different trajectory. The industrialization of the early XX century increased coal and oil consumption, driving economic growth in countries like Japan and China. Post-World War II, Japan focused on modernizing its energy systems, emphasizing the development of nuclear power as a cornerstone of its energy mix. By the late XX century, China prioritized expanding its coal industry, which played a pivotal role in its economic rise (Bağlıtaş and Atik 2023). However, with the onset of the XXI century, Asia faced challenges of rising environmental degradation. This led to substantial investments in renewable energy, with the emergence as a global leader in developing solar farms.

International cooperation has also been a critical aspect of policy in both regions. In Europe, the establishment of the European Energy Community in 2005 strengthened coordination among EU nations. In Asia, China's "Belt and Road Initiative" has played a significant role, with investments in energy frameworks across countries, including renewable energy projects (Bağlıtaş and Atik 2023). These historical developments reflect both differences and similarities in how Europe and Asia address energy security, sustainability, and innovation.

Approaches to energy policy in Europe and Asia differ based on geopolitical, economic, and environmental factors that shape each region's strategy (Gonand et al. 2024). These disparities are especially noticeable when addressing global challenges, increasing demand, and the quest for energy security. In Europe, energy policy is strongly oriented toward sustainable development and reducing carbon emissions (Kuznetsov et al. 2004; Lyubchyk et al. 2015). European nations are actively integrating biomass into their energy systems. The EU's strategy emphasises building a low-carbon economy by decreasing dependence on fossil fuels and enhancing efficiency (Table 1).

Europe is striving to diversify its energy sources and supply routes (Dai et al. 2025). This includes increasing investments in nuclear energy and expanding infrastructure for importing energy, particularly through pipelines and liquefied natural gas (LNG) terminals (Hartvig et al. 2024). Another key aspect of European energy policy is the development of interconnections, which help integrate energy systems across countries and enable more efficient energy use.

In contrast, Asia faces unique energy policy challenges driven by rapid economic growth, high population density, and enormous energy demands. For many Asian countries, especially China, India, and Southeast Asian nations, energy security remains a top priority. Most countries in the region continue to rely on traditional sources, while renewable adoption is still gaining momentum.

Table 1. Key approaches to energy policy in Europe and Asia

Tabela 1. Kluczowe podejścia do polityki energetycznej w Europie i Azji

Criterion	Europe	Asia
Main energy policy goals	Sustainable development, carbon emissions reduction, carbon neutrality	Energy security, meeting growing energy demand
Primary energy sources	Renewable energy (wind, solar, biomass), nuclear energy	Fossil fuels (coal, oil, gas), expanding RES
Dependence on coal	Efforts to reduce coal usage	High dependence on coal, especially in China and India
Key initiatives	European Green Deal, Paris Agreement	Development of solar and wind energy in China, transition to RES
Technological priorities	Integrating RES, improving energy efficiency, cross-border interconnections	Advancing technologies for coal and gas extraction, creating new energy supply routes
International cooperation	Active collaboration within the EU and through international agreements	Formation of international energy alliances, diversification of energy supply sources
Challenges	Achieving carbon neutrality, high cost of RES	High carbon emissions, need for modernization of energy infrastructure
Future and strategy	Transition to carbon neutrality by 2050, growth of RES and energy efficiency	Increasing the share of RES, advancing technologies, improving energy infrastructure for security and sustainability

Source: compiled by the authors based on Hancock and Wollersheim (2021), Hall and Kanaan (2021).

China, the world's largest energy consumer, is actively developing renewable sources and is a global leader in solar panel manufacturing (Le and Nguyen 2019). However, it remains the largest coal consumer, complicating efforts to achieve carbon neutrality. India, meanwhile, struggles with energy shortages to meet its growing demand, further deepening its reliance on coal. Similarly, Southeast Asian nations, such as Indonesia and Vietnam, heavily depend on coal in their energy mix, despite growing efforts to transition to renewables.

Another critical aspect of Asia's energy policy is the construction and enhancement of infrastructure for extracting and transporting resources like oil and gas. Countries in the region are focused on diversifying supply routes and improving energy independence by developing new transport pathways and establishing international energy alliances.

The key approaches to energy policy in Europe and Asia differ significantly. Europe focuses on sustainable development, integrating sources. In contrast, Asia continues to rely heavily on traditional energy sources while also working on diversifying supplies and adopting new technologies to enhance energy security.

2.2. Energy security strategies in different countries

Energy security strategies are a vital element of a country's development, as energy powers economies, infrastructure, and social systems (LaBelle 2023). Below, explore the approaches implemented in Germany, France, China, Japan, and Uzbekistan, showcasing various models of energy security that reflect economic, geopolitical, and environmental considerations (Table 2).

Table 2. Energy security strategies in Germany, France, China, Japan, and Uzbekistan

Tabela 2. Strategie bezpieczeństwa energetycznego w Niemczech, Francji, Chinach, Japonii i Uzbekistanie

Criterion	Germany	France	China	Japan	Uzbekistan
1	2	3	4	5	6
Main goals	Phase-out of nuclear energy, achieving carbon neutrality, expanding RES	Maintain a high share of nuclear energy, reduce carbon emissions	Ensure energy security, support industrial growth, reduce import dependency	Reduce reliance on fossil fuels, improve energy efficiency	Achieve energy independence, increase renewable energy share
Energy sources	RES (wind, solar), gas, coal, phasing out nuclear energy	Nuclear energy (70% of production), develop RES, reduce coal use	Fossil fuels (coal, oil, gas), RES (solar, wind), hydropower	Gas, oil, RES, nuclear energy, hydrogen technologies	Gas, coal, hydropower, solar, and wind energy
Key initiatives	"Energy Transition" program (Energiewende), coal phase-out by 2038	Increase investment in nuclear energy, implement emissions reduction programs	"Belt and Road" initiative (new energy corridors), decarbonization programs	"Green Growth" program, diversify energy sources, develop RES and hydrogen energy	"Uzbekistan Energy Strategy", attract foreign investments in energy
Technological focus	Develop and integrate RES, modernize energy systems, build smart grids	Advanced nuclear reactors, improve energy efficiency, support green technologies	Carbon capture technologies, RES deployment, nuclear technology investments	Hydrogen energy development, increase RES share, build high-efficiency gas plants	Develop RES, modernize outdated energy infrastructure, build new solar plants
International cooperation	Active participation in climate agreements (e.g., Paris Agreement), energy collaboration within the EU	Leadership in international environmental initiatives, partnerships with developing countries	Join international alliances, export RES technologies, expand global influence	Integration with global markets, participation in climate initiatives	Cooperate with international organizations and regional partners, expand energy partnerships

1	2	3	4	5	6
Key challenges	High costs of transitioning to RES, gas supply instability	Challenges in modernizing nuclear plants, insufficient RES investments	Dependence on coal, high carbon emissions, need for substantial investments	Limited natural resources, heavy reliance on imports	High energy losses in the grid, dependency on imported technologies
Future strategy	Achieve carbon neutrality by 2045, accelerate RES development	Expand nuclear capacity, develop green energy	Increase RES share, reduce carbon emissions, establish new energy routes	Invest in RES, improve energy efficiency, boost hydrogen energy	Reduce coal and gas dependency, attract RES investments, improve energy efficiency
Regulations	Renewable Energy Act (EEG), Energy Security Act (EnSiG)	Energy Modernisation Act (Loi Énergie-Climat), Atomic Energy Agency regulations	Energy Law of China, strategic energy development plan	New Energy Act (Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities), Hydrogen Society program	"Electricity Law", "Uzbekenergo" program

Source: compiled by the authors based on Marhold (2023), Liu et al. (2019), Luñez-Jimenez and De Blasio (2022).

Germany focuses on transitioning to carbon neutrality by actively adopting RES, coal, and nuclear power. Under the "Energiewende" program, the country aims to phase out coal entirely by 2038 and nuclear energy by 2022. Germany is integrating RES into its national energy system while advancing energy storage technologies and "smart" grids. The Renewable Energy Sources Act (EEG) (2023) and the Energy Security Act (EnSiG) (1975) provide the legal framework for these initiatives.

France, in contrast, prioritizes nuclear energy, which accounts for around 70% of its electricity generation. Key policy goals include reducing carbon emissions, maintaining nuclear energy's role, and promoting RES development. France is investing significantly in modernizing nuclear power plants with advanced technologies to enhance their safety and efficiency (Bacherikov et al. 2024). The Energy and Climate Law (2019) establishes legislative guidelines for transitioning to a sustainable energy system.

China, the world's producer, focuses on ensuring energy security and meeting its growing energy demands. Coal, oil, and gas remain primary energy sources, although the country is rapidly developing solar and wind power. Through the Belt and Road Initiative, China is creating new energy supply routes and investing in carbon capture and RES technologies (Lyu 2019). The Energy Law of the People's Republic of China (2024) governs the strategic planning and implementation of national energy programs. Japan faces challenges due to limited natural

resources and a high dependence on energy imports. The country emphasizes diversifying energy sources, including developing hydrogen technologies and renewable energy. The Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities (2011) outlines policies to support green energy, including subsidies and tax incentives.

Uzbekistan focuses on achieving energy independence, modernizing its infrastructure, and increasing the share of RES (Yakubova 2025). While coal, gas, and hydropower are the primary energy sources, the country is actively developing plants. The "Uzbekistan Energy Strategy" program aims to minimize energy losses and attract investments into the energy sector. The Electricity Law outlines initiatives for modernizing the energy system and promoting foreign investment.

Europe's primary focus is on transitioning to carbon neutrality, decarbonization, and adopting green technologies, while Asian countries prioritize energy security and meeting growing demand (Mišík 2022). Despite differing approaches, all countries recognize the importance of diversifying energy resources, adopting innovative technologies, and fostering international collaboration to achieve sustainable development. Key parameters include energy sources, production volumes, dependence on imports, and investments in renewable energy (Table 3).

Table 3. Statistical data from empirical research

Tabela 3. Dane statystyczne z badań empirycznych

Parameters	Germany	France	China	Japan	Uzbekistan
Share of RES in energy balance (2023)	46%	25%	15%	22%	13%
Main energy sources	Solar, wind energy	Nuclear energy, RES	Coal, RES	Natural gas, RES	Gas, coal, RES
Energy import dependency	67%	45%	15%	88%	35%
CO_2 emissions per capita (tons)	8.4	4.6	7.4	9.5	4.2
Investment in RES (2023)	USD 38 billion	USD 7 billion	USD 125 billion	USD 17 billion	USD 2 billion
Share of coal in energy production	30%	5%	58%	26%	42%
Carbon neutrality target	By 2045	By 2050	By 2060	By 2050	No clear target
Strategic projects	Offshore wind energy development	Nuclear power expansion	Investment in solar stations	Hydrogen technologies	Increase in gas production

Source: compiled by the authors based on: Renewable Energy Sources Act (EEG) (2023), Energy Security Act (EnSiG) (1975), Energy and Climate Law (2019), China's new Energy Law (2024), Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities (2011), Law of the Republic of Uzbekistan No. ZRU-539 "On the use of renewable energy sources" (2019).

The main energy security strategies of countries reflect their unique approaches to meeting current and future energy needs. Germany focuses on phasing out nuclear energy and developing RES. As of the end of 2023, 46% of the country's energy balance is provided by RES, which demonstrates significant progress, though the country remains dependent on energy imports. Germany invested USD 38 billion in modernizing energy grids and building new solar parks (Renewable Energy Sources Act (EEG) 2023).

In contrast, France emphasizes the use of nuclear energy, which accounts for 70% of its energy balance, while actively increasing the share of RES (Energy and Climate Law 2019). This strategy allows France to not only stabilize its domestic market but also export electricity. In 2023, USD 7 billion was invested in solar farms.

China stands out for its focus on energy security and the modernization of the coal industry, as well as its active development of RES. Despite the dominance of coal in its energy balance (58%), the country has achieved remarkable progress in constructing some of the largest wind farms globally. China invested a record USD 125 billion in renewable energy, solidifying its position (Interesse 2024). Japan, on the other hand, focuses on diversifying energy sources, with an emphasis on natural gas and hydrogen technologies (Act on Special Measures Concerning… 2011). Japan's energy dependence remains high (88%), but the country is actively investing USD 17 billion in the development of hydrogen technologies and RES projects.

Uzbekistan plans to boost its domestic gas production and establish solar power plants, with the goal of having 13% of its energy mix come from RES. The country remains heavily reliant on gas and coal, with USD 2 billion invested in the development of RES. Germany and France's strategies within Europe focus on achieving carbon neutrality, accompanied by significant investments in renewable and nuclear energy. In Asia, the approaches vary significantly: China and Uzbekistan continue to rely on coal and gas, while Japan is betting on hydrogen technologies.

Common trends include increased investment in RES, a reduction in dependence on traditional energy sources, and a focus on sustainable development (Sherpard et al. 2022). To improve outcomes, it is recommended to intensify international cooperation for technology transfer, attract private capital to RES projects, and develop long-term carbon-neutrality strategies for countries with high CO_2 emissions.

Significant ecological factors, including the effects on biodiversity, soil and water pollution, and the state of local ecosystems, cannot be ignored in a thorough examination of energy policy and its consequences for economic security (Fedoniuk et al. 2024). The energy policies of countries, especially those that mostly rely on conventional energy sources like coal, oil, and natural gas, are strongly correlated with these environmental factors. Fossil fuel extraction, transportation, and use frequently lead to habitat loss, decreased biodiversity, and negative impacts on regional wildlife and plants (Buzhyn 2023). Extensive energy projects, like hydroelectric dams, mining, and oil drilling, have the potential to upset fragile ecosystems, displacing species and destroying natural habitats (Medvedieva et al. 2024). Additionally, by restricting species migration and lowering genetic diversity, these activities contribute to ecosystem fragmentation, which can make these ecosystems less resilient to changes in the environment.

Apart from their effects on biodiversity, energy policies have the potential to worsen pollution of water and soil. Dangerous substances, including Sulphur dioxide, nitrogen oxides, and particulate matter, are released during the burning of fossil fuels like coal and oil (Nechaieva et al. 2025). These pollutants can contaminate water supplies and deteriorate the quality of soil. Acidification of water bodies due to pollution can harm aquatic life and decrease the amount of clean water available for agricultural and human use. Long-term environmental harm can also result from the introduction of hazardous chemicals and heavy metals into nearby soil and water systems through runoff from industrial energy operations like coal mines and oil extraction sites (Savchuk 2023). These contaminants pose serious health dangers to both humans and wildlife because they can build up in the food chain.

Energy policies also have an impact on the state of local ecosystems, especially when they put economic expansion ahead of environmental preservation. Pollination, water purification, soil fertility, and other ecosystem services that are essential to agricultural productivity and human well-being might be jeopardized by the destruction of ecosystems brought on by energy production (Kunitskiy et al. 1988; Prokopov et al. 1989). Deforestation for energy, frequently associated with hydropower or biofuel production, worsens soil erosion, messes with water cycles, and reduces the ability to sequester carbon (Skliar et al. 2024). These impacts can make it more difficult to maintain economic security by undermining long-term agricultural productivity and adding to the larger problems caused by climate change. Given the connection between environmental health and economic resilience, every energy policy that seeks to promote economic stability must also include a thorough evaluation of its ecological impact.

Although economic and energy security outcomes are frequently the main criteria used to evaluate energy policy, ecological effects must also be taken into account for a more thorough and long-term evaluation. The long-term sustainability of energy methods is limited by their inadequate consideration of the detrimental environmental effects of these tactics, including pollution, ecosystem deterioration, and biodiversity loss. Integrating ecological factors into decision-making processes is essential as nations move towards more sustainable energy systems in order to protect future generations' economic stability and environmental integrity.

2.3. The effectiveness of energy strategies in ensuring national security

The effectiveness of energy strategies plays a crucial role in ensuring the economic security of states, as the stability of the economy is directly dependent on the reliability of the energy supply. In the context of countries like Germany, France, China, Japan, and Uzbekistan, each with its own unique approach to energy policy, different models can be observed that affect economic security (Table 4).

Germany, with its ambitious strategy to transition to renewable energy, known as "Energiewende" (Energy Revolution), aims to reduce dependence on fossil fuels and lower

Table 4. Effectiveness of energy strategies in the context of ensuring economic security of states

Tabela 4. Skuteczność strategii energetycznych w kontekście zapewnienia bezpieczeństwa ekonomicznego państw

Country	Key elements of energy strategy	Advantages	Challenges and risks	Impact on economic security
Germany	Transition to RES (Energiewende)	Diversification	Issues with ensuring energy supply stability	Increases environmental security
	Reducing reliance	Job creation in the RES	Dependence on external gas supplies	Potential risks to economic stability due to gas supply instability
France	Use of nuclear energy as the main energy source	Energy independence	Risks to the safety of nuclear facilities	Ensures energy stability
	Support for renewable energy sources	Stability and availability of energy for industry	Problems with nuclear waste disposal	High long-term risks for safety in case of nuclear plant accidents
China	Development of RES	World leader in solar and wind energy production	Dependence on foreign trade in energy resources	Promotes long-term economic security by increasing energy independence
	Reducing dependence oil, gas imports	Reduced carbon emissions	Environmental risks from large-scale energy infrastructure projects	Protects against external threats
Japan	Development of renewable energy after the Fukushima disaster	Reduced carbon emissions	Natural resource shortage	Reduces vulnerability to global energy crises
	Reducing dependence on nuclear energy	Development of new technologies in the energy sector	Dependence on energy imports	Economic security depends on external energy supply
Uzbekistan	Development of RES (especially solar)	Resilience to external economic shocks	Issues with modernising old infrastructure	Improves economic external energy sources, promoting renewable development
	Diversification sources	Potential savings on energy imports	Dependence on coal and gas	

Source: compiled by the authors based on Öge (2021), Pistikou et al. (2023).

carbon emissions (Pogoretskyy and Talus 2020). In the context of the global climate crisis, this becomes a key element of economic security, enabling Germany to diversify energy sources and reduce environmental risks. However, in recent years, Germany has faced challenges with the instability of natural gas supplies and energy efficiency issues, which threaten the stability of its energy system.

France, on the other hand, focuses on nuclear energy, which makes up a significant portion of its energy consumption. Nuclear energy provides France with relatively stable and independent

energy sources, minimizing reliance on external supplies. However, this strategy is accompanied by long-term risks related to the safety of nuclear plants, the disposal of nuclear waste, and public opinion on the safety of this type of energy. Despite these challenges, France continues to support this model, arguing that it helps ensure economic security by providing stable and affordable energy to industry and households.

China, as the largest energy consumer in the world, actively develops both traditional and renewable energy sources. China's strategy is aimed at achieving energy independence and reducing environmental impact. In recent decades, China has been actively investing in infrastructure to reduce carbon emissions. China's economic security largely depends on its ability to maintain this balance and protect its energy infrastructure from external threats and natural disasters.

Japan, after the Fukushima nuclear disaster in 2011, revised its energy strategy. While the country still uses nuclear energy, its role has been significantly reduced, and attention has shifted to developing renewable energy sources and improving energy efficiency. Japan faces a shortage of natural resources, making it dependent on energy imports, which affects its economic security (Gavkalova et al. 2024). At the same time, Japan is actively developing new technologies for creating sustainable energy systems, which enhances its long-term economic security.

Uzbekistan, developing its economy in the context of limited natural resources, is focused on modernizing its energy infrastructure and developing renewable energy sources. Uzbekistan's strategy aims sources and decrease reliance on imported resources. One key aspect is the development of solar energy, which is crucial for ensuring the country's economic security. However, Uzbekistan continues to invest in the gas and coal industries, making it vulnerable to external economic and political factors, such as fluctuations in global energy markets.

The effectiveness of energy strategies in ensuring economic security in these countries depends on the ability to balance internal needs with global economic and environmental challenges. Each country has its strengths and weaknesses, and the success of its energy strategy is determined by its ability to adapt to changing external conditions and minimize risks related to energy dependence and environmental threats.

3. Discussion

Analyzing the energy strategies of Germany, France, China, Japan, and Uzbekistan reveals that integrating energy security into each country's overall economic strategy has a profound impact on its stability and competitiveness. European countries such as Germany and France are actively developing renewable energy sources and improving energy efficiency, which helps reduce dependence on external energy suppliers. In China and Japan, strategically important investments are being made in energy infrastructure and clean, contributing to energy security to

the stability of their economies. Although Uzbekistan is just beginning its energy reforms, it is already implementing initiatives to modernize its energy sector, which is crucial for maintaining economic stability in the country.

The results of this study on energy policy and its impact on economic security in Europe and Asia align with the conclusions presented in Siddi's (2019) work, especially context of analyzing the external energy policy. In particular, also concluded that the EU's strategies aimed at diversifying energy sources and reducing dependency face significant political and economic challenges. As the author notes, the EU's approach to energy security has proven to be not only ineffective but also politically motivated, which complicates the implementation of long-term and stable energy strategies. This study confirms that despite the EU's efforts to develop alternative energy sources, these efforts do not always yield the desired results and face numerous obstacles, including geopolitical risks and internal socio-economic issues that limit the successful implementation of strategies.

Vošta (2023) emphasizes the key role of international energy trade in ensuring the resilience of energy security. The author argues that despite the EU's active efforts, significant challenges remain due to geopolitical risks and the volatility of global energy markets. The research confirms that countries in Europe, such as Germany and France, despite successful initiatives in renewable energy, remain vulnerable due to political instability and external economic factors. Similarly, in Asia, as the author notes, the development of energy infrastructure, particularly in China and Japan, requires substantial investments and a strategic approach to ensure long-term stability.

Zehir et al. (2023) analyze the European Union's energy supply strategies through the lens of social network analysis. The authors emphasize the importance of a strategic energy trade supply, arguing that energy security requires diversity in energy sources and international coordination. The results of their study confirm that in Europe, the strategy of diversifying energy supplies helps to significantly reduce dependence on external sources. However, this strategy faces several challenges related to political instability and changing geopolitical conditions. Similar issues are observed in Asia, where countries like China and Japan are confronted with the need to diversify their energy sources in the face of high risks associated with dependence on traditional energy carriers. As noted in the research by Zehir et al. (2023), Asian countries are actively developing projects aimed at expanding energy infrastructure, as well as implementing new technologies and renewable energy sources, which is a key factor for their economic stability.

The findings of the study on the impact of energy policy security Europe and Asia slightly differ from the conclusions presented by Phan et al. (2021). The author argues that uncertainty in economic policy is closely tied to financial stability and significantly affects energy resource markets. According to the analysis, economic uncertainty in energy policy leads to increased volatility in financial markets, reduced investor confidence, and general economic risks. However, the results show that in both Europe and Asia, the impact of uncertainty in energy policy on financial stability is not always so pronounced. Specifically, in Europe, despite significant changes in energy policy, transition to RES, and the diversification of supplies, did not find clear signs that uncertainty leads to persistent economic crises or a significant decline in financial stability. On the contrary, EU countries, despite challenges in energy security, have been able to

maintain their financial stability through long-term strategies and effective integration of new energy sources into the economy.

Qin et al. (2020) study highlights the asymmetric effects of geopolitical risks, which significantly impact the returns and volatility of energy markets, especially in unstable market conditions. Geopolitical instability causes significant price fluctuations in energy resources, which can be particularly noticeable in countries heavily dependent on energy imports (Ibraimov et al. 2025). However, the research found that, unlike the asymmetric effects of geopolitical risks presented by the author, the influence of energy policy on economic security in Europe and Asia was not always as pronounced. Specifically, in Europe, despite geopolitical instability, EU countries were able to develop strategies to diversify energy supplies and transition to renewable energy sources, reducing the impact of geopolitical risks on energy markets and enhancing energy security.

Rühl (2022) focuses on the consequences of energy sanctions for the global economy, dividing them into mandatory and unilateral sanctions. He emphasizes that unilateral sanctions have a stronger impact on target countries, disrupting economic stability and worsening international relations, while mandatory sanctions generally have a more limited effect. The results of the study show a somewhat different picture, especially in the context of comparing Europe and Asia. Concluded that in the European Union, despite the possible negative effects of energy sanctions, these measures caused relatively less damage to economic stability than Rühl predicted. Specifically, due to the high level of energy source diversification and well-developed infrastructure for transitioning to renewable energy, European countries were able to minimize the impact of sanctions on the economy and maintain energy security.

Soliman and Nasir (2019) concluded that effective energy policies aimed at reducing emissions are closely tied to carbon emission prices and impact the stability of economic systems in Europe. The conducted study also confirms the importance of this connection, especially in the context of energy policy and economic security in Europe and Asia. In Europe, where the implementation of emissions trading mechanisms significantly influenced the regulation of carbon prices, positive results in terms of economic stability can be observed. The EU's energy policy, combined with emissions trading, not only contributes to reducing stimulates innovation in RES, thereby strengthening economic security.

Suh and Yang (2021) concluded that global uncertainty and economic-political uncertainty have different consequences for corporate investment activity. Our research confirms that energy policy in Europe and Asia, as part of the global economic strategy, influences economic security and the investment attractiveness of regions. The EU's energy policy, aimed at reducing carbon emissions and accelerating the transition to renewable energy sources, creates significant challenges for investment (Tarasiuk et al. 2025). This aligns with the authors' conclusions that investments under uncertainty depend on policies designed to overcome these challenges. The findings of the study align with those of Zhang et al. (2021). The authors' comprehensive approach to measuring and improving regional energy security, which includes both quantitative and qualitative methods. The conducted research confirms that a similarly balanced approach is important in the context of energy policy and economic security for both Europe and Asia.

The study highlights the importance of effectively integrating energy policy into the strategy of ensuring economic security in both Europe and Asia. Energy policies in these regions differ due to variations in economic conditions, resource availability, and political situations. In Europe, energy efficiency and sustainable development have long been key elements of economic security, with a recent trend toward reducing dependence on traditional energy sources (Adamchuk et al. 2016).

Similar processes, despite differences in approaches and levels of development, are also taking place in Asia, where energy security strategies are being actively developed. Unlike Europe, Asia faces a higher dependence on energy imports, especially in countries like Japan and China, which requires them to develop more flexible and effective mechanisms for ensuring energy security. China, for example, is actively developing domestic energy production, including investments in nuclear and solar energy, and is implementing innovative technologies.

Conclusions

In Europe, there is a noticeable shift towards adopting more sustainable and eco-friendly energy solutions, policies, and approaches aimed at reducing environmental impact and enhancing energy efficiency. This not only reduces the negative environmental impact but also lowers dependence on external energy supplies. Countries like Germany and France are actively developing renewable energy sources, which strengthens their energy security and reduces vulnerability to external economic and political risks.

In Europe, special attention is paid to integrating renewable energy sources into existing energy infrastructure. The creation of "smart" energy systems and the active implementation of energy storage technologies help minimize dependence on unstable external supplies and increase flexibility in managing energy resources. This combination of sustainability and innovation enables the European Union to not only achieve its climate goals but also create jobs in green technologies, which positively impacts the overall economy.

In contrast, the situation in Asia presents distinct characteristics. Although countries in the region, such as China, Uzbekistan, and Japan, are actively modernizing their energy infrastructure, they still maintain a high dependence on energy imports, which creates additional challenges for ensuring economic security. China, for example, is actively developing its own energy capacity and implementing innovative renewable energy technologies, but faces issues related to the need to diversify energy supplies and reduce carbon emissions.

Japan, after the Fukushima nuclear disaster in 2011, significantly revised its energy policy, focusing on safety and diversification of energy sources. Despite the country's active development of renewable energy technologies, its continued reliance on imports of oil and natural gas poses substantial risks to the economy, including vulnerability to price fluctuations, supply disruptions, and geopolitical tensions, which can undermine economic stability and growth. Uzbekistan, on

the other hand, faces the need to improve its energy infrastructure and find sustainable energy sources to meet growing demands while reducing environmental impact.

Thus, despite shared goals for energy security, the approaches to solving this issue vary significantly between Europe and Asia. In Europe, the focus is on sustainable development and reducing the carbon footprint, while in Asia, the primary task remains the modernization of energy infrastructure and ensuring energy independence. These differences are driven by political and economic factors, differences in technological development levels, and the geopolitical situation. In Europe, sustainability and ecology take center stage, while in Asia, the pursuit of energy security is often linked to the need to regulate external dependence on energy resources.

In the future, the integration of innovative technologies and sustainable management of energy resources will become the main factors determining the strategy for ensuring economic security in both regions. Countries in both Europe and Asia will strive to create flexible and resilient energy systems that can meet the needs of both environmental safety and economic stability.

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Abror Olimov

Polityka energetyczna i bezpieczeństwo ekonomiczne: porównanie Europy i Azji

Streszczenie

Celem niniejszego badania jest analiza wpływu polityki energetycznej na bezpieczeństwo ekonomiczne w krajach europejskich i azjatyckich. Metodologia obejmuje analizę porównawczą polityk energetycznych w Europie i Azji, wraz z analizą treści ram prawnych, analizą statystyczną danych energetycznych oraz studiami przypadków w celu oceny skuteczności strategii energetycznych w zapewnianiu bezpieczeństwa gospodarczego. Porównano kluczowe aspekty strategii energetycznych, takie jak zależność od importowanych zasobów energetycznych, rozwój energii odnawialnej i efektywność energetyczna, oraz przeanalizowano, w jaki sposób czynniki te wpływają na stabilność gospodarczą. W badaniu przeanalizowano doświadczenia krajów europejskich, takich jak Niemcy i Francja, krajów azjatyckich, takich jak Chiny i Japonia, oraz Uzbekistanu, który aktywnie poprawia swoją infrastrukturę. Podkreślono rolę decyzji politycznych, inwestycji w zaawansowane technologie i współpracy międzynarodowej w zapewnieniu stabilności energetycznej. Kraje o zróżnicowanych źródłach energii wykazują większą odporność na kryzysy gospodarcze i zewnętrzne naciski polityczne w porównaniu z tymi o niższej niezależności energetycznej. Doświadczenia krajów europejskich, azjatyckich i Uzbekistanu pokazują, że polityka energetyczna jest kluczowym czynnikiem bezpieczeństwa gospodarczego. Niezawodne i dostępne źródła energii są niezbędne do stabilnego wzrostu gospodarczego. Stwierdzono, że kraje przyjmujące innowacyjne podejście w sektorze energetycznym, w szczególności poprzez rozwój energii odnawialnej i środki oszczędzania energii, mogą osiągnąć długoterminowe bezpieczeństwo gospodarcze. Wyniki podkreślają znaczenie przyjęcia strategicznego podejścia do polityki energetycznej jako kluczowego elementu zapewnienia bezpieczeństwa gospodarczego w zglobalizowanym środowisku.

Słowa kluczowe: strategia, zasoby, inwestycje, efektywność energetyczna, dostawy energii