
Poland's Energy Security Within European Union After February 24, 2022

Original article

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Abstract

Objectives: The objective of this paper is to analyse the evolution of Poland's energy security strategy within the European Union before and after 24 February 2022 and to identify key challenges and policy responses. The research hypothesis assumes that the Russian invasion of Ukraine has accelerated the transition of Poland and the EU towards greater energy independence and diversification.

Results: The findings indicate that Poland has achieved substantial progress in energy supply diversification, primarily through infrastructure investments such as the Baltic Pipe and the expansion of LNG terminals. The effectiveness of diversification measures remains dependent on the consistent implementation of PEP2040 and on institutional integration with EU energy policy frameworks.

Conclusions: The analysis confirms that the war in Ukraine has accelerated structural changes in Poland's energy security policy, including supply diversification, infrastructure expansion and a marked reduction of dependence on Russian energy resources. Long-term energy security remains conditional.

1. Introduction

Energy security constitutes a core component of both national and European Union public policies. The Russian invasion of Ukraine in February 2022 fundamentally disrupted existing energy supply chains and exposed structural weaknesses in the energy systems of EU Member States, particularly those heavily dependent on external suppliers (Le Coq & Paltseva, 2022). In this context, Poland was forced to rapidly redefine its energy security strategy within the broader EU framework.

The aim of this paper is to analyse the evolution of Poland's energy security policy before and after 24 February 2022, with particular emphasis on diversification of energy sources, changes in import dependency, infrastructure development, as well as alignment with European Union energy and climate mechanisms. The analysis is conducted in a comparative perspective, combining the national level (Poland) with the supranational level (European Union).

The hypothesis of the study assumes that the outbreak of the war in Ukraine has significantly accelerated Poland's process of diversification away from Russian energy supplies and strengthened the integration of Polish energy policy with EU-level instruments and strategic initiatives. This hypothesis implies that the war acted not merely as a disruptive external shock, but as a catalyst intensifying trends that had previously progressed at a slower pace.

Preparing the energy sector to operate under conditions of crisis requires long-term planning and sustained policy coordination (Kaczmarek, 2021, p. 178). Rising prices of energy resources, growing geopolitical instability and increasing interdependence between states, international organisations and transnational corporations have made energy security a key determinant of contemporary international relations. Despite efforts to develop a common EU energy policy, energy security remains strongly dependent on national decisions, particularly in crisis situations (Dupont & Oberthür, 2012, pp. 228-247). As a result, tensions persist between national sovereignty in energy policy and the objectives of collective action at the EU level. Eurostat data for the years 2018–2024 are used to analyse energy balances, import dependency and the structure of energy consumption (IEA, 2023).

The European Union represents one of the largest and most dynamic energy markets in the world, while at the same time remains structurally dependent on imported energy resources. Historical data indicate that this dependence has increased over time and is likely to remain high in the medium term. Consequently, the creation of an integrated internal energy market, based on solidarity among Member States and coordinated relations with external suppliers, has become a strategic priority. However, as noted by Misiągiewicz (2019), EU actions in this area have been fragmented, with Member States continuing to pursue largely individual strategies in line with the principle of subsidiarity. The Russian aggression against Ukraine significantly amplified the risks associated with this lack of coherence, turning energy dependence into a direct security threat for both the EU and its Member States, including Poland.

This study focuses on Poland's energy security, analysed against the background of European Union energy policy. To ensure analytical clarity, the article has been structured around the following research questions:

- How strong were Polish and European energy security strategies prior to 24 February 2022?
- What were the key characteristics of Polish and European energy security strategies before the outbreak of the war in Ukraine?
- How has the war in Ukraine affected energy security in Poland and the European Union?
- What are the main features of Polish and European energy security strategies after 24 February 2022?
- What measures are necessary to further strengthen Polish and European energy security under current conditions?

1. Theoretical background

The concept of energy security has no single, universally accepted definition. In general terms, energy security refers to the ability of a state to ensure uninterrupted access to energy resources sufficient to meet basic economic and social needs, including during crises or international conflicts (Klare, 2008). Kalicki and Goldwyn (2005) define energy security as the availability of reliable, continuous and affordable energy supplies without major disruptions.

Energy security consists of two core dimensions. The first concerns the capacity of the energy system to meet demand under normal conditions. This includes continuity of supply, technical reliability, acceptable prices and compliance with environmental standards. The second dimension relates to the ability to maintain energy supply under adverse conditions. These include crises, natural disasters and international conflicts (Misiągiewicz, 2019). This dimension covers both the stability of imported energy supplies and the resilience of national energy infrastructure (Proninska, 2006).

From a national perspective, energy security depends on system flexibility. This includes the capacity to shift between energy sources and adapt supply structures in response to external shocks. From an international perspective, it requires risk assessment related to specific suppliers and transit routes (Misiągiewicz, 2019). In the European Union, diversification of energy sources and transport routes is treated as a central condition of long-term energy security (Szulecki et al., 2016).

Many authors identify diversification as the key operational element of energy security. In this approach, energy security is understood as a set of measures aimed at reducing dependence on a single external supplier. Stachowiak (2006) defines energy security as the ability of the national economy to ensure both current and long-term energy supply at socially acceptable prices while maintaining political independence. This definition directly links energy dependence with the risk of political pressure exerted by external suppliers.

At the EU level, energy security is defined as a situation in which the risk of fuel and energy supply disruptions remains limited. Full energy security allows national energy systems to operate without interruption even if supplies from one or more sources are reduced or cut off. Diversification of supply sources is therefore treated as a necessary condition of system stability. According to this approach, EU energy security rests on three pillars: increased use of domestic resources, development of alternative energy sources, and diversification of imported fuels (Paczkowska et al., 2008).

Geopolitical factors have played a decisive role in shaping European energy security. Russia's energy policy in the 2000s was increasingly perceived as an instrument of foreign policy pressure. Gas supply interruptions affecting Belarus and Ukraine confirmed the risk of using energy exports as a political tool. As a result, imports from Russia became a structural vulnerability for the EU. By 2007, Russian supplies had accounted for 27% of EU crude oil imports and 24% of natural gas imports. Several Member States showed extreme dependency. Germany covered 39% of its demand with Russian supplies. Slovakia, Bulgaria, and Finland were almost fully dependent on Russian gas (Paczkowska et al., 2008).

Attempts to reduce this dependency included diversification projects outside Russia's direct influence. These efforts focused on the Caspian region, the Caucasus and Central Asia. The most significant initiative was the Nabucco gas pipeline project, intended to deliver gas to Europe from Azerbaijan, Iran, Iraq and Egypt via Turkey and South-Eastern Europe (Baev & Øverland, 2010). Despite its strategic importance, the project was abandoned in 2013. According to Muszyńska and Mańk (2015), this failure exposed structural weaknesses of EU energy policy, including decision-making inertia, bureaucratic constraints, as well as the inability to reconcile divergent national interests. The abandonment of Nabucco delayed the reduction of EU dependence on Russian energy supplies.

Other diversification options identified in EU debates included liquefied natural gas imports from Qatar, Nigeria, Trinidad and Tobago, as well as the development of nuclear energy and renewable sources such as wind and hydropower (Paczkowska et al., 2008). These directions had formed the structural background of EU energy security policy prior to 2022 and remain relevant in the current security environment.

2. Energy Security of Poland before the War in Ukraine

Until the mid-2000s, diversification was not a priority in energy policy of the European Union. This changed after Russian gas supply interruptions to Belarus in 2004 and to Ukraine in 2006. These events exposed the vulnerability of EU states dependent on one external supplier. Russian energy policy became a geopolitical risk factor (Paczkowska et al., 2008). The EU reacted by initiating coordination efforts in energy policy. A key step was the European Commission's Green Paper of March 2006. The document defined energy security, competitiveness, and sustainability as strategic objectives (Humphrey et al., 2011; Umbach, 2010). Implementation remained fragmented. National policies prevailed. Post-2022 assessments confirm the scale of pre-war vulnerability (OSW, 2024).

Before 24 February 2022, Poland's energy system had depended on imported fossil fuels. Coal had accounted for 46%, oil for 29% and natural gas for 17% of total energy consumption. Renewable sources had accounted for 8% (Eurostat, 2023). Import dependency exceeded the EU average. Russian supplies had dominated Poland's import structure. Oil imported from Russia had covered 63% of imports. Russian gas had covered 55% and hard coal had covered 72% (GUS, 2023). This dependency had created a structural security risk. Supply concentration had increased exposure to political pressure. Polish strategic documents adopted before 2022 had acknowledged this risk. The Energy Policy of Poland until 2040 and the Strategy for Responsible Development had identified diversification and infrastructure development as priorities. Planned actions had included LNG expansion, gas interconnections, as well as gradual changes in the energy mix. Nevertheless, the implementation was slow and the coordination with EU frameworks remained limited.

Post-2022 assessments confirm the scale of pre-war vulnerability. Eurostat data for 2018–2022 show persistent fossil fuel import dependency despite growth in renewable capacity (Eurostat, 2023; Eurostat, 2024). Analytical reports indicate that diversification measures implemented before the war did not eliminate exposure to supply shocks (IEA, 2023). Independent analyses reach similar conclusions. Reports published after 2022 highlight that Poland entered the war period with high sensitivity to external disruptions and geopolitical pressure (OSW, 2024). EU-level assessments identify the same structural weaknesses across several Member States (European Commission, 2023).

3. Energy Security of Poland after the Outbreak of the War in Ukraine

Russian aggression against Ukraine fundamentally altered the energy security landscape of Poland and the European Union. Energy security gained strategic priority. Reducing dependence on Russian supplies and accelerating diversification became urgent policy objectives. Long-term assumptions based on cheap Russian gas collapsed after February 2022. The war destabilised existing energy strategies across Europe. Energy transition plans required revision. Climate neutrality targets had to be aligned with security constraints, thus geographic diversification of supply directions became a necessity rather than an option (SmogLab, 2022).

Before the war, Poland remained highly dependent on Russian energy imports. This dependency constituted both an economic burden and a strategic vulnerability. Dependence on Russian supplies limited political autonomy and increased exposure to external pressure (Boussena & Locatelli, 2017). In 2020, Russian gas accounted for 55% of Polish gas imports, equivalent to 9.6 billion m³ out of nearly 18 billion m³. Russian oil covered 65% of crude oil imports, amounting to approximately 16.4 million tonnes. Russian hard coal accounted for 75% of imports, exceeding 9 million tonnes. Financial transfers linked to energy imports reinforced this dependency. In 2020 alone, Poland paid Russia approximately PLN 18 billion for gas, PLN 31 billion for oil and PLN 4 billion for coal. Total payments reached PLN 53 billion. This amount was comparable to the annual budget of the Polish Ministry of National Defence (Fijak, 2022; Jędrak, 2022).

Eliminating imports of Russian coal, oil and gas involved significant economic costs. These costs were widely assessed as unavoidable. The withdrawal from Russian supplies served three objectives: strengthening energy security, reducing Russia's economic capacity and supporting climate and air quality goals (Jędrak, 2022). Energy revenues constituted a major source of Russia's economic and military potential. Continued purchases of Russian fuels undermined both Ukrainian security and European strategic interests. At the EU level, REPowerEU measures had reduced imports of Russian energy by approximately 90% by the end of 2024 (European Commission, 2023).

Gas dependency represented the most acute vulnerability. Poland's annual gas demand amounted to approximately 20.6 billion m³. Imports covered nearly 18 billion m³. Russian supplies accounted for almost half of this volume. This structure created a critical security gap. The response was infrastructural and immediate. The Baltic Pipe gas pipeline was launched in autumn 2022. The pipeline enabled direct gas imports from the Norwegian Continental Shelf via Denmark and the Baltic Sea. Full capacity of 10 billion m³ per year had been achieved by the end of 2022. The expiration of the Yamal contract coincided with the operationalisation of the pipeline (Fijak, 2022).

Infrastructure expansion was complemented by LNG capacity growth. The Świnoujście LNG terminal was expanded to 8.3 bcm. These investments covered domestic gas demand, including demand growth margins. At the EU level, REPowerEU measures had reduced imports of Russian energy by approximately 90% by the end of 2024. Strategic coordination intensified. Cooperation with Norway, Germany and Lithuania expanded under the National Energy and Climate Plan and REPowerEU frameworks. The war has accelerated structural change in energy policy of the European Union. Diversification gained priority. Support for renewable energy increased. Security considerations began to dominate energy planning. The invasion of Ukraine acted as a catalyst for systemic shifts in EU energy security strategy (Le Coq & Paltseva, 2022).

4. The Role and Importance of Sustainable Sources and Nuclear Energy in the Present Situation

After 2022, the energy mix in Poland and the European Union has become a core element of energy security policy. The war in Ukraine has shifted priorities. Cost optimisation has lost importance, while system stability, resilience and supply security have gained priority. These changes support the research hypothesis. The war has accelerated structural adjustments and strengthened alignment with EU energy frameworks.

Renewable energy has expanded rapidly after 2022, with wind and solar energy dominating new capacity. Short construction time mattered while investment costs declined. The share of renewables in electricity generation have increased in Poland and across the EU (Eurostat, 2024). Fossil fuel demand has decreased, limiting the exposure to external supply shocks. Nevertheless, renewable energy remains structurally limited since its output depends on weather. Seasonal variability persists. Storage capacity remains insufficient at system scale. Renewables alone do not ensure supply continuity during crises.

Nuclear energy compensates for these limitations. It provides stable and controllable generation. Baseload supply remains independent of weather and fuel import volatility. Lifecycle analyses confirm low greenhouse gas emissions across construction, operation, and decommissioning phases. Nuclear power functions as a system-stabilising component of the post-2022 energy mix (IEA, 2023). After the outbreak of the war, nuclear energy gained strategic relevance. It was treated as a substitute for coal and gas generation. This role supports diversification and reduces reliance on imported fuels. The Polish Nuclear Power Programme became a security priority. Implementation accelerated due to geopolitical risk. At the EU level, nuclear energy was incorporated into post-2022 energy and sustainability frameworks. Regulatory recognition reduced investment uncertainty. Policy coherence improved. Consistency between national strategies and EU security objectives increased (European Commission, 2023). This confirms the research hypothesis on intensified integration after 2022.

The post-2022 energy mix is based on complementarity. Renewables reduce emissions and diversify supply. Nuclear power ensures stability and continuity. Together, they limit dependence on imported fuels and geopolitical pressure. The transition follows a security-driven logic rather than a purely climate-oriented model. The combined development of renewables and nuclear energy addresses vulnerabilities revealed by the war in Ukraine. Economic efficiency is no longer the sole criterion. Resilience, controllability and strategic autonomy define energy policy after 2022. These outcomes directly support the research hypothesis (Sovacool et al., 2023).

Conclusions

The hypothesis of the research has been confirmed. The Russian invasion of Ukraine has acted as a decisive accelerator of changes in Poland's energy security policy. After February 2022 diversification processes have intensified and integration with European Union energy mechanisms increased. The launch of the Baltic Pipe and the expansion of LNG capacity eliminated dependence on Russian gas supplies. These infrastructure investments have significantly improved supply security. They reduced exposure to geopolitical pressure and strengthened Poland's position within the EU energy system. Structural challenges however remain. Long-term energy security depends on continued investment in renewable and nuclear energy. Grid capacity and system flexibility require further development. Financing constraints limit the pace of transformation. These factors represent the main barriers to sustained energy security gains.

At the EU level, REPowerEU has provided a coherent framework for diversification and demand reduction. National policies aligned more closely with EU objectives after 2022. This confirms that the war strengthened policy convergence between Poland and the European Union. Future research should focus on implementation outcomes. Particular attention should be given to the effectiveness of REPowerEU instruments and the execution of the Energy Policy of Poland until 2040. Grid modernisation and financing mechanisms require detailed

evaluation. These areas will determine the durability of post-2022 energy security improvements.

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