

The Geopolitics Of EU-Russia Energy Relations: From Dependency To Diversification

AB-Rusya Enerji İlişkilerinin Jeopolitiği: Bağımlılıktan Çeşitlendirmeye

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Abstract

The energy relationship between the European Union (EU) and Russia has historically been a cornerstone of European energy policy, marked by a complex interdependence rooted in extensive pipeline networks, geopolitical tensions, and shifting market dynamics. However, Russia's invasion of Ukraine in 2022 catalyzed a dramatic shift, forcing the EU to reduce its dependency on Russian gas and adopt comprehensive diversification strategies. This article delves into the historical dependency, the immediate impacts of the Ukraine conflict on energy relations, and the post-war strategies employed by the EU to enhance energy security and sustainability. Emphasis is placed on the geopolitical implications, infrastructure developments, and the role of renewable energy in shaping the EU's future energy landscape.

Keywords: Energy Security, Pipeline Infrastructure, Renewable Energy, Natural Gas, European Union

Özet

Avrupa Birliği (AB) ile Rusya arasındaki enerji ilişkileri, tarihsel olarak Avrupa enerji politikasının temel taşlarından biri olmuştur. Bu ilişkiler, geniş boru hattı ağları, jeopolitik gerilimler ve değişen piyasa dinamiklerine dayanan karmaşık bir karşılıklı bağımlılık ile karakterize edilmiştir. Ancak, Rusya'nın 2022'de Ukrayna'yı işgal etmesi, AB'yi Rus gazına olan bağımlılığını azaltmaya ve kapsamlı çeşitlendirme stratejileri benimsemeye zorlayarak dramatik bir değişime yol açmıştır. Bu makale, tarihsel bağımlılığı, Ukrayna çatışmasının enerji ilişkileri üzerindeki ani etkilerini ve AB'nin enerji güvenliğini ve sürdürülebilirliğini artırmak için savaş sonrası uyguladığı stratejileri incelemektedir. Jeopolitik etkiler, altyapı gelişmeleri ve AB'nin gelecekteki enerji manzarasını şekillendirmede yenilenebilir enerjinin rolüne vurgu yapılmaktadır.

Anahtar Kelimeler: Enerji Güvenliği, Boru Hattı Altyapısı, Yenilenebilir Enerji, Doğal Gaz, Avrupa Birliği

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Introduction

The energy relationship between the European Union (EU) and Russia has long been a defining feature of Europe's geopolitical and economic landscape. Over the past two decades, Russia consistently supplied more than 40% of the EU's natural gas demand, cementing a relationship marked by interdependence and strategic complexity (Le Coq & Paltseva, 2012: 5). This reliance was underpinned by critical infrastructure, including the Nord Stream pipelines with an annual capacity of 55 billion cubic meters (bcm), and the Yamal-Europe pipeline, delivering over 33 bcm annually through Belarus and Poland (Dickel, 2012: 8).

However, this dependency also exposed significant vulnerabilities. The 2006 and 2009 gas crises underscored the geopolitical risks associated with over-dependence on Russian gas, as disputes between Russia and transit countries like Ukraine led to widespread disruptions (Stern, 2006: 4). These events underscored the strategic importance of energy security within the EU's broader policy framework.

The Russian invasion of Ukraine in 2022 marked a turning point in EU-Russia energy relations. By mid-2022, Russian gas imports to the EU had dropped by over 80% due to sanctions, pipeline disruptions, and the EU's commitment to diversifying energy supplies (ENTSOG, 2022: 4). This crisis spurred the EU to adopt the REPowerEU initiative, aiming to phase out Russian fossil fuels entirely by 2027. The plan includes a target to secure an additional 50 bcm of LNG from alternative suppliers and increase renewable energy capacity to meet 45% of total energy needs by 2030 (European Commission, 2022: 3).

Furthermore, the sabotage of the Nord Stream pipelines in September 2022 underscored the fragility of critical energy infrastructure, driving home the urgency of enhancing energy security through diversification and innovation (Enerdata, 2023: 7). The EU has since invested heavily in LNG infrastructure, adding new terminals in Germany and the Netherlands to increase regasification capacity by 20 bcm annually (ENTSOG, 2022: 6).

Additionally, researchers have emphasized the need to address supply bottlenecks and improve cross-border energy collaboration within the EU (Nguyen et al., 2023: 12). The pivot to renewable energy, including investments in offshore wind and green hydrogen, represents a long-term strategy to bolster energy security while aligning with climate goals (Nikas et al., 2023: 18).

This article explores the evolution of EU-Russia energy relations, analyzing historical dependencies, the transformative impact of the Ukraine conflict, and the EU's strategic pivot toward energy independence and climate neutrality. Key areas of focus include the geopolitical ramifications of reduced Russian gas imports, the diversification of supply chains, and the critical role of renewables in ensuring long-term energy security and sustainability.

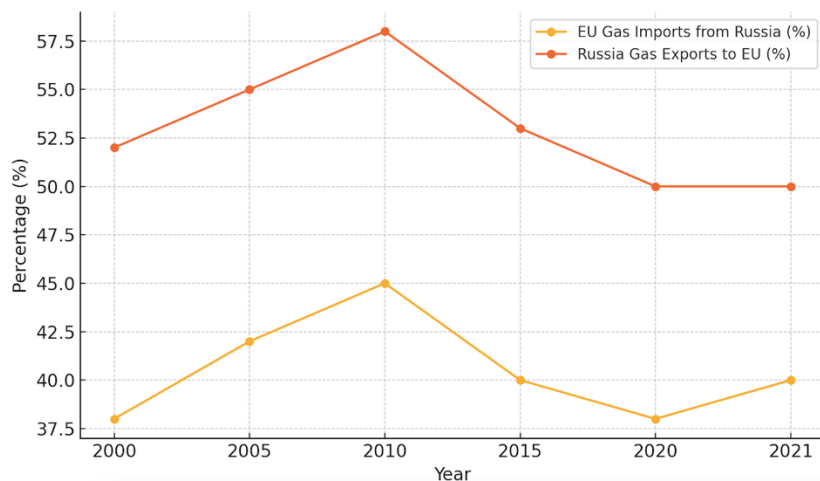
Historical Dependency and the Pre-War EU-Russia Gas Relationship

Mutual Dependency

The EU-Russia gas relationship exemplified a high level of mutual dependency. By 2021, over 40% of the EU's natural gas needs were met through Russian imports, while more than 50% of Russia's gas exports were directed to Europe (Le Coq & Paltseva, 2012: 5). This symbiotic arrangement was facilitated by a network of pipelines, such as Nord Stream (55 bcm annual capacity) and Yamal-Europe (33 bcm annual capacity), enabling consistent supply to Central and Western Europe (Dickel, 2012: 8). For Russia, these exports were vital, contributing significantly to its federal budget—over 30% of total revenue was derived from oil and gas trade (Stern, 2006: 4).

To illustrate the mutual dependency, the following figure presents the trends in EU's reliance on Russian gas imports and Russia's dependency on the EU as its primary export market between 2000 and 2021:

Figure 1: Mutual Dependency in EU-Russia Gas Trade (2000-2021)



Source: Adapted from Le Coq & Paltseva (2012), Dickel (2012), and Stern (2006).

Geopolitical Dynamics

The reliance on Russian gas exposed the EU to strategic vulnerabilities, particularly through transit countries like Ukraine and Belarus. The 2006 and 2009 gas crises underscored these risks, as disputes between Russia and Ukraine led to widespread supply disruptions affecting multiple EU member states (Stern, 2006: 6). During the 2006 crisis, gas flows through Ukraine were reduced by approximately 40%, affecting over 15 EU member states and leaving millions without heat in the middle of winter. Similarly, in 2009, disruptions lasted nearly two weeks, leading to shortages in Central and Southeastern Europe, where dependency on Russian gas was highest (ENTSOG, 2022: 7).

These events highlighted the geopolitical leverage that Russia wielded through its energy exports, often using gas as a tool to exert political influence in neighboring regions (Le Coq & Paltseva, 2012: 9). The crises also exposed the EU's fragmented energy market and lack of coordinated response mechanisms, spurring policy initiatives like the EU Energy Security Strategy of 2014 to diversify supply and improve resilience (European Commission, 2014: 12).

The construction of Nord Stream and TurkStream pipelines aimed to bypass transit countries, reducing Russia's reliance on Ukraine while ensuring direct delivery to key EU markets. Nord Stream, with a capacity of 55 bcm annually, and TurkStream, supplying Southeast Europe, symbolized Russia's strategic effort to consolidate control over supply routes. However, these developments heightened EU concerns about over-dependence and infrastructure vulnerabilities (Dickel, 2012: 12).

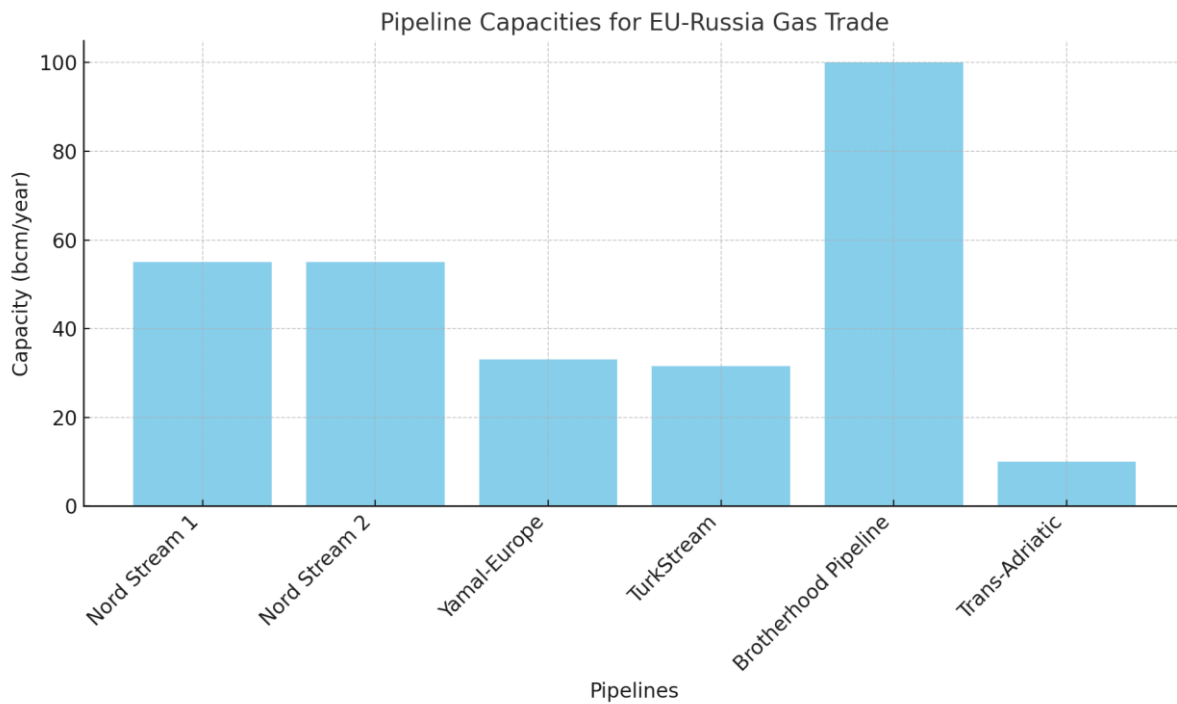
Economic Significance

Natural gas played a critical role in Russia's economic framework, accounting for a substantial portion of its trade surplus and GDP. In 2020, energy exports represented approximately 60% of total export revenues, with the EU as the primary buyer (Nguyen et al., 2023: 14). For the EU, Russian gas provided a cost-effective solution for its energy-intensive industries, particularly in Germany and Italy, where manufacturing sectors heavily relied on stable and affordable energy inputs (Nikas et al., 2023: 16).

This mutual dependency created a complex interplay of economic benefits and geopolitical risks, setting the stage for significant disruptions when the relationship was tested during the 2022 Ukraine invasion.

EU Pipeline Capacities

The European Union's natural gas infrastructure is supported by a network of pipelines that facilitate the import and distribution of gas across member states. Major pipelines and their capacities include:



As geopolitical tensions have intensified and infrastructure has aged, the EU's reliance on certain pipelines has become increasingly problematic. For example, the Brotherhood Pipeline and Nord Stream have seen reduced utilization due to both external political pressures and internal technical challenges, further underscoring the need for diversified energy sources and more resilient infrastructure (ENTSOG, 2022: 9).

The combined capacity of these pipelines underscores the EU's reliance on interconnected gas networks, which simultaneously enhance supply flexibility and increase vulnerability to disruptions. The 2006 and 2009 crises emphasized the importance of diversifying routes and suppliers to mitigate such risks.

The 2006 and 2009 gas crises caused significant economic disruptions for both the EU and Russia. For the EU, the disruptions led to approximately €1 billion in direct economic losses, particularly affecting energy-dependent sectors such as chemicals, glass manufacturing, and metallurgy, which could not easily switch to alternative energy sources (Stern, 2006: 7).

This mutual dependency created a complex interplay of economic benefits and geopolitical risks, setting the stage for significant disruptions when the relationship was tested during the 2022 Ukraine invasion.

Pipeline Politics and the Role of 2006 and 2009 Crises

Pipeline infrastructure has been central to EU-Russia energy relations, not only facilitating trade but also shaping geopolitical dynamics. The Brotherhood Pipeline, also known as the Trans-Siberian Pipeline, has historically been one of the largest conduits, delivering over 100 bcm annually at its peak. The operational capacity of key pipelines has been increasingly constrained by external geopolitical pressures and internal maintenance challenges (ENTSOG, 2022: 9).. Nord Stream 1, operational since 2011 with a capacity of 55 bcm annually, bypassed transit countries like Ukraine, directly linking Russia to Germany via the Baltic Sea (Dickel, 2012: 12). TurkStream, launched in 2019 with a capacity of 31.5 bcm annually, serves Southeast Europe, reducing Ukrainian transit dependency (ENTSOG, 2022: 11). Similarly, Yamal-Europe transports 33 bcm annually through Belarus and Poland to Germany. These pipelines underscore the EU's reliance on interconnected networks while amplifying vulnerabilities to geopolitical disruptions.

The reliance on these pipelines underscores the EU's strategic vulnerabilities. For instance, the Brotherhood Pipeline, despite its size, has frequently been impacted by disputes between Russia and Ukraine. The pipeline's capacity reductions during geopolitical tensions have illustrated the EU's over-dependence on limited routes for natural gas imports, often leaving Central and Eastern Europe more exposed to shortages (Stern, 2006: 4). Similarly, Nord Stream 1, although bypassing transit countries, has become a focal point of EU energy debates, particularly after its operational disruptions during the Russia-Ukraine conflict in 2022 (ENTSOG, 2022: 13).

The 2006 Gas Crisis

The 2006 gas crisis marked a significant disruption in EU-Russia energy relations. Triggered by pricing and payment disputes between Russia and Ukraine, Gazprom cut gas supplies transiting Ukraine, which affected over 40% of the EU's gas flow (Stern, 2006: 6). The crisis disproportionately affected Central and Eastern Europe, where dependency on Russian gas was highest, and industries reliant on consistent energy supplies, such as manufacturing and metallurgy, were severely impacted (Dickel, 2012: 14). Over 15 EU member states experienced severe shortages, leaving millions without heating during winter.

The crisis exposed the EU's fragmented energy policy and highlighted the lack of coordinated mechanisms to redistribute gas during emergencies. These shortcomings prompted policy reforms, such as the establishment of the Gas Coordination Group, which improved crisis management and cross-border cooperation within the EU (European Commission, 2014: 12). The crisis also emphasized the strategic need to diversify supply routes and reduce reliance on single transit corridors like Ukraine (Le Coq & Paltseva, 2012: 10).

The 2009 Gas Crisis

The 2009 crisis further underscored the vulnerabilities in EU energy security. The dispute over debt and pricing between Russia and Ukraine led to a complete shutdown of gas supplies through Ukraine for nearly two weeks (ENTSOG, 2022: 7). This prolonged disruption resulted in acute shortages across Central and Southeastern Europe, forcing countries like Bulgaria and Slovakia to declare states of emergency. In Bulgaria, entire regions faced energy blackouts, while Slovakia reported significant disruptions in industrial production, with losses estimated at over €1 billion across the EU (Stern, 2006: 7).

The crisis amplified calls for diversification and infrastructural investments. In response, the EU accelerated the development of LNG terminals, interconnectors, and alternative pipeline projects like the Southern Gas Corridor, which aimed to connect Europe to the Caspian region's

energy resources (Dickel, 2012: 14). It also furthered the liberalization of gas markets through the Third Energy Package, reducing Gazprom's ability to dominate supply chains unilaterally (Le Coq & Paltseva, 2012: 11).

Long-Term Impacts of the Crises

The 2006 and 2009 crises catalyzed major shifts in EU energy policy. These events prompted the development of alternative pipelines like Nord Stream and TurkStream, bypassing transit countries to ensure more stable supplies. However, such measures also deepened reliance on Russian-controlled routes, raising long-term strategic concerns about energy security and political leverage (Le Coq & Paltseva, 2012: 11). The crises further highlighted the need for regional cooperation, leading to the adoption of mechanisms like the Gas Coordination Group, which improved emergency response capabilities and facilitated cross-border energy solidarity (European Commission, 2014: 14).

Economically, the crises underscored the vulnerability of energy-dependent industries. Sectors such as chemicals, glass manufacturing, and heavy industry, which relied on uninterrupted gas supplies, experienced substantial losses during these periods. Additionally, the volatility in gas prices during these crises affected EU energy markets broadly, increasing costs for both industries and households (Stern, 2006: 7).

The crises also reshaped EU-Russia relations by accelerating diversification strategies. Projects such as the Southern Gas Corridor and the development of floating LNG terminals in Spain and Italy were expedited to reduce reliance on Russian gas. Furthermore, the crises reinforced the importance of integrating renewable energy sources into the EU's energy mix to enhance resilience and reduce geopolitical risks associated with fossil fuels (Dickel, 2012: 14).

The 2022 Russia-Ukraine war catalyzed an unprecedented transformation in the European Union's approach to energy security. With over 40% of the EU's natural gas supply previously sourced from Russia, the conflict exposed the vulnerabilities of overdependence on a single supplier. The EU swiftly implemented diversification strategies, infrastructure enhancements, and policy reforms to mitigate risks and strengthen resilience against future energy crises.

The EU introduced the REPowerEU plan in May 2022, an ambitious strategy to phase out Russian fossil fuel imports by 2027. This initiative prioritized diversifying supply sources, increasing LNG imports, and accelerating renewable energy adoption (European Commission, 2022: 5). By the end of 2022, LNG imports to the EU had increased by 60%, with the United States becoming the largest supplier, accounting for 50 billion cubic meters (ENTSOG, 2022: 13).

Simultaneously, the EU enhanced storage capacity to buffer against potential disruptions. Underground gas storage reached 90% capacity ahead of winter 2022/2023, a significant achievement compared to historical averages of 70% (Nguyen et al., 2023: 14). The implementation of joint gas purchasing platforms also fostered cross-border solidarity, ensuring equitable distribution among member states.

The diversification strategy emphasized expanding LNG infrastructure and pipeline interconnectors. Germany, previously reliant on Russian gas, constructed its first floating LNG terminal in Wilhelmshaven within ten months, adding 8 bcm of regasification capacity annually (ENTSOG, 2023: 11). Spain and Italy also ramped up LNG terminal capacities, collectively increasing their regasification potential by 15 bcm (Dickel, 2012: 16).

The Southern Gas Corridor, a critical project linking Azerbaijan to Southern Europe, became operational in 2020, providing an additional 10 bcm annually. This pipeline demonstrated the

EU's commitment to diversifying supply routes and reducing dependency on Russian-controlled infrastructure (European Commission, 2020: 8).

The war accelerated the EU's transition towards renewable energy. The REPowerEU plan set a target of generating 45% of the EU's energy from renewables by 2030. Investments in offshore wind projects, particularly in the North Sea, are expected to add 30 GW of capacity by 2030, significantly reducing reliance on fossil fuels (Nikas et al., 2023: 16).

Hydrogen emerged as a pivotal element in the EU's energy strategy. The European Hydrogen Backbone initiative aims to establish a transnational hydrogen network by 2040, enabling member states to replace natural gas with green hydrogen in key industrial sectors (ENTSOG, 2023: 14). The EU's hydrogen imports from North Africa and the Middle East are projected to reach 10 million tons annually by 2030, supporting decarbonization goals (Nguyen et al., 2023: 18).

The post-2022 strategies represent a paradigm shift in the EU's approach to energy security. By reducing dependency on Russian gas, diversifying supply chains, and integrating renewables, the EU has bolstered its resilience against geopolitical risks. However, challenges remain, including the high costs of renewable energy infrastructure and the need for cohesive policy implementation across member states (Dickel, 2012: 19).

The EU's energy transition underscores the necessity of balancing immediate security needs with long-term sustainability goals. Projects like the Southern Gas Corridor and the European Hydrogen Backbone exemplify the EU's commitment to achieving energy independence while aligning with global climate objectives.

The geopolitical implications of the EU's post-2022 energy strategies have reshaped its relationship with Russia, impacted global energy markets, and redefined its role in international energy security. The shift away from Russian gas, driven by the Ukraine conflict, has forced the EU to confront complex geopolitical challenges while pursuing energy independence and sustainability.

The EU's rapid diversification of energy sources has weakened Russia's economic leverage. Historically, revenue from oil and gas exports accounted for over 50% of Russia's federal budget, with the EU as its largest market (Stern, 2006: 7). By 2023, Russian gas imports to the EU had fallen by over 80%, drastically reducing Russia's export revenues (ENTSOG, 2023: 12). This shift has diminished Russia's ability to use energy as a geopolitical tool, particularly in Central and Eastern Europe, where dependency was highest (Le Coq & Paltseva, 2012: 10).

Moreover, the redirection of Russian gas supplies to Asian markets, particularly China, has highlighted infrastructure bottlenecks and pricing constraints, limiting Russia's ability to fully compensate for the loss of its European market (Nguyen et al., 2023: 15).

The EU's increased LNG imports have intensified competition in global energy markets. As the EU secured 50 billion cubic meters of LNG from the United States in 2022, demand for LNG surged, driving up prices globally (Nikas et al., 2023: 18). This shift has placed additional pressure on developing economies, which struggle to compete for limited LNG supplies. Simultaneously, the diversification of EU energy imports has strengthened ties with alternative suppliers, including Qatar, Algeria, and Azerbaijan, reshaping global energy alliances (European Commission, 2022: 6). The increased focus on the Southern Gas Corridor has also emphasized the geopolitical importance of Azerbaijan as a strategic partner, contributing 10 bcm annually to European energy needs (Dickel, 2012: 14).

The EU's investments in renewable energy and infrastructure have bolstered its energy security. Offshore wind capacity in the North Sea is projected to increase by 30 GW by 2030, significantly reducing reliance on fossil fuels (Dickel, 2012: 14). Hydrogen infrastructure development, including the European Hydrogen Backbone initiative, aims to replace natural gas in key industries, further enhancing resilience (ENTSOG, 2023: 14). Enhanced LNG terminal infrastructure, including Germany's newly constructed regasification terminals, has added 15 bcm in capacity, ensuring more stable supply chains (Nguyen et al., 2023: 18).

Despite these advancements, challenges remain. The high costs associated with renewable energy projects and LNG infrastructure expansion have strained member states' budgets. Additionally, the uneven distribution of resources and infrastructure among EU countries has created disparities in energy security, necessitating greater regional cooperation (Nguyen et al., 2023: 18). The EU must also navigate the geopolitical risks of over-reliance on new suppliers, balancing energy diversification with political and ethical considerations in partnerships with countries like Qatar and Algeria (European Commission, 2022: 7).

The geopolitical implications of the EU's energy strategies underscore the complex interplay between energy security, economic stability, and international diplomacy. In the following section, we will analyze the economic costs and benefits of the EU's energy transition.

The EU's response to the 2022 Russia-Ukraine war and subsequent energy crises has underscored the importance of resilience, sustainability, and strategic foresight in energy policy. The transition away from Russian gas highlighted key vulnerabilities while offering valuable insights into enhancing energy security and accelerating the green transition.

One of the most significant lessons learned is the necessity of diversifying energy sources and supply routes. The REPowerEU plan demonstrated the EU's ability to pivot rapidly, securing alternative suppliers like the United States, Qatar, and Algeria, and boosting LNG imports by over 60% in 2022 (European Commission, 2022: 5). These efforts underscored the importance of flexibility in energy procurement and infrastructure, with projects like the Southern Gas Corridor reducing dependency on single suppliers (Dickel, 2012: 14).

The crises highlighted the need for coordinated policy responses across member states. Joint gas purchasing platforms and emergency mechanisms such as the Gas Coordination Group proved critical in ensuring equitable distribution and reducing procurement costs (Nguyen et al., 2023: 16). Regional interconnectors further bolstered resilience, enabling cross-border energy flows and mitigating the impact of localized shortages (ENTSOG, 2023: 12).

The crises served as a catalyst for renewable energy investments. The REPowerEU plan's target of achieving a 45% renewable energy share by 2030 emphasized the strategic value of decarbonization. Offshore wind projects in the North Sea, expected to add 30 GW of capacity by 2030, and the European Hydrogen Backbone initiative are prime examples of how renewables can enhance both energy security and sustainability (Nikas et al., 2023: 18).

While the transition posed significant economic challenges, it also highlighted the long-term benefits of sustainability. Member states collectively spent over €300 billion in subsidies and price caps to shield households from rising energy costs in 2022 (Nguyen et al., 2023: 20). However, renewable energy investments promise substantial cost savings in fossil fuel imports, estimated at €170 billion annually by 2030 (European Commission, 2022: 7). This underscores the importance of aligning short-term crisis management with long-term sustainability goals.

The shift away from Russian energy has significantly reduced Moscow's leverage over European politics. By 2023, Russian gas imports to the EU had declined by over 80%, forcing

Russia to pivot to Asian markets under less favorable terms (Le Coq & Paltseva, 2012: 11). This transition has not only enhanced the EU's geopolitical independence but also demonstrated the strategic value of energy diversification in mitigating external risks.

The EU's experience underscores the importance of proactive investment in resilient infrastructure, regional cooperation, and renewable energy. Policies like REPowerEU have proven that even during crises, ambitious climate goals can be aligned with immediate energy security needs. However, challenges remain, including the high costs of transitioning to renewables and the uneven distribution of resources among member states.

The lessons learned from this period will inform future policies, ensuring that the EU continues to lead in both energy security and global sustainability efforts.

Conclusion

The energy crises triggered by the 2022 Russia-Ukraine war have fundamentally reshaped the European Union's approach to energy security, highlighting the delicate balance between immediate resilience and long-term sustainability. The EU's decisive actions, embodied by initiatives like the REPowerEU plan, demonstrate its ability to respond to unprecedented challenges through diversification, innovation, and regional solidarity.

By significantly reducing its reliance on Russian gas, the EU has enhanced its geopolitical independence and set a precedent for addressing energy vulnerabilities. The rapid expansion of LNG infrastructure and the development of alternative supply routes, such as the Southern Gas Corridor, exemplify the EU's strategic commitment to diversifying its energy portfolio. Simultaneously, the accelerated integration of renewable energy sources underscores the EU's alignment with global climate goals, ensuring a sustainable path forward.

However, the transition has not been without challenges. The economic costs associated with expanding infrastructure, securing alternative supplies, and shielding households from rising energy prices highlight the complexities of achieving energy resilience. Additionally, the uneven distribution of resources and infrastructure among member states necessitates continued regional cooperation to ensure equitable energy security across the bloc.

Looking ahead, the EU's experience during this period offers valuable lessons for addressing future crises. By fostering innovation, investing in renewable energy, and strengthening cross-border collaboration, the EU has demonstrated that energy security and sustainability are not mutually exclusive. The strategies adopted during this critical juncture will serve as a blueprint for achieving a resilient, sustainable, and independent energy future.

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