

Pipelines of Power: Energy Security, Geopolitics, and Regional Resilience in a Fragmented Visegrad Region

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Abstract

Purpose - This study examines the determinants of natural gas supply strategies in the Visegrad countries between 1990 and the post-2022 energy crisis, focusing on the interaction between geographical proximity to Russia, inherited Soviet-era pipeline infrastructure, and domestic political-economic conditions.

Design/methodology/approach - Using a comparative case study design based on process tracing and contribution analysis, the paper identifies the causal mechanisms linking structural conditions to national energy policy outcomes in the Czech Republic, Slovakia, Hungary, and Poland.

Findings - The findings demonstrate that geographical proximity to Russia influences threat perception and diversification behavior, but its effects are conditional rather than deterministic. Likewise, inherited pipeline infrastructure creates path dependency and institutional inertia, yet these constraints can be mitigated through market liberalization, strategic investment, and integration into European energy networks. Poland most strongly confirms the role of threat perception in driving diversification, while the Czech Republic emerges as a deviant case due to early liberalization, institutional capacity, and advantageous access to Western infrastructure. Slovakia and Hungary illustrate more pragmatic and path-dependent trajectories shaped by domestic political priorities, transit interests, and state control over strategic sectors.

The study further shows that the post-February 2022 energy crisis and EU initiatives such as REPowerEU have significantly altered the relevance of traditional dependency variables. The expansion of LNG infrastructure, reverse-flow capacities, and regional interconnections has reduced the rigidity of pipeline-based dependence and increased the importance of market integration and policy-driven diversification. At the same time, climate policy, ESG commitments, and decarbonization objectives increasingly shape regional energy strategies alongside geopolitical considerations.

Originality - The paper contributes to the energy security literature by developing a conditional and multi-variable analytical framework that integrates geopolitical, economic, and institutional perspectives. It argues that energy dependence in Central Europe is best understood not as a fixed structural condition, but as a dynamic outcome shaped by policy choices, institutional capacity, market structures, and evolving European energy governance.

Keywords: Energy security; Geopolitics; Natural gas; Visegrad countries; Russia; Energy transition; REPowerEU

Paper type: Research Article

1. Introduction

This research seeks to analyze and understand the nature of relations between Russia and Visegrad countries through the prism of natural gas supplies over the past three decades. The region's close ties to Russia developed in the past and stayed to some extent even after the political transition. Even though the creation of the Visegrad Group in 1991 targeted the integration of the Euro-Atlantic institutions, which was successful, the seat in the Western institutions has not meant the loss of Russian influence in the Visegrad region. The research works with the idea that the Visegrad region is an intermediate geopolitical "corridor" between the West and Russia, not only in terms of geography but also in security, economics, and culture (Tsygankov, 2016). The region became a strategic area, and its geopolitical and geostrategic importance is increasing. In the post-transition era, Russia has adopted the Visegrad countries' soft power concept, understanding that the economic, socio-cultural, and institutional instruments are more capable in the present-day world than military power or direct political and economic pressure. The research tracks the framework of the global structure in which the Visegrad region and its natural gas supplies are explained. The bipolar world collapsed in 1989/1991. It was followed by the ideas of a unipolar world until 2001, when a shift toward the new structure happened. Another milestone occurred in 2004 when all four Visegrad countries joined the EU after a great recession caused by the world financial crisis in 2008. The final indicator happened with the 2015 agreement on the Nord Stream 2 project, which radically shuffled the cards in the gas supply game (Denková & Gotev, 2015).

The fact that the Visegrad region will continue to depend on fossil fuel imports in the future shapes the region's need to protect itself from disruptions of supplies. This is quite easy for most fuels. For example, oil can easily be transported and traded across the world because it is a globally traded commodity. Any country is not dependent on a single source of supply, and the purpose of the oil sector is, to some extent, limited by transit infrastructure and the structural dependency of users (Högselius, 2013). The nuclear fuel suppliers belong to a specific, highly diversified, and strictly regulated sector that is quite

limited in terms of the number of actors that can take part in it. In the former Communist region, nuclear energy was established with the help of the Soviet Union, and power plants in this region inherited Russian technologies. The fact is that the nuclear sector affects many more related industrial subsectors. Usually, the country that decides to use a certain supplier is most likely to stay with this supplier for decades. Moreover, the Euratom Supply Agency cares about the stable supply of uranium. However, natural gas is a more problematic fuel. Gas import infrastructure (pipelines, LNG terminals) is more expensive, and the new pipelines take decades to build. They also need the cooperation of all countries whose territories the route passes through, which is often difficult to reach. These factors affect gas producers and importers and their position on the market, as well as long-term gas supply contracts. It is difficult for the Visegrad countries to find alternative countries to Russia that can export cheap natural gas in large amounts. For example, oil, in comparison with gas, is available worldwide, and this makes gas much more securitized. Also, political instability in North Africa and the Middle East limits the group of potential suppliers. The International Energy Agency (IEA) expects high levels of dependence on Russian gas to continue until at least 2040 (Zeniewski, 2019). The above-mentioned facts are reasons why this research scope focuses primarily on natural gas supplies over all other fossil fuels.

The research is relevant and important for three main reasons: there has been a need for research on this topic, and it undertakes undertheorized International Relations theoretical views to influence international relations and energy security, as well as dealing with urgent and topical issues. In the Visegrad region, there has been a lack of research into the domestic attitudes of governments towards their reliance on Russian energy policy and their economic analyses, with the lack of an international relations approach. The importance of this research can be seen from the lack of literature in this area.

While the vast amount of literature would reflect that there already exists a strong theoretical underpinning to the subject, the opposite is, in fact, true. Some authors, such as Yergin (2006), do undertake a geopolitical viewpoint; however, these are fully descriptive and do not present a tendency into what variables one needs to look at to analyze and understand energy security in foreign policy. From the wider perspective, we know little about the behavior of energy-dependent importing countries worldwide, mainly the way domestic conditions and elite observation affect their responses to sectoral dependency. The analytical framework introduced here could be of benefit when applied to other cases within this understudied group of countries and other countries in transition from the former Soviet sphere of influence.

Already observed differences in natural gas supplies between identical Visegrad countries are the cause of the puzzle that leads to this research. In search of the explanation of why there have been such clear differences between otherwise similar countries, a deeper historical investigation of how policy choices were made in the context of power transition is needed. At the time when officials, formerly in positions of power, and newly empowered actors faced a new reality together with new opportunities of having access to material resources and information, many of them chose new options to support the rise of their influence and power.

Following the fact that the Visegrad countries differ from each other in terms of energy, the research question is: Why do some Visegrad countries under comparable conditions make different choices in natural gas prioritization and supply source diversification? There are two possible reasons for this motivation: security and price. After the transition, the Visegrad countries had more important security issues to deal with, and natural gas supplies were not a priority. For example, the dissolution of Czechoslovakia, the financial crisis in Russia, and the war in Yugoslavia and Kosovo kept gas prices low, and supplies were not under visible threat. The first warning sign was raised during the 2006 natural gas supply crisis, and after the second one in 2009, when the gas crisis happened again and had a serious effect on the Visegrad countries. This was a big switch in the decision-making of Visegrad leaders as they turned towards a strong securitization and sped up gas diversification. Considering the fact that the Visegrad countries pay higher prices for Russian natural gas than Western countries, the Visegrad leaders should put more effort into cooperation to negotiate fair gas prices. However, currently, this is not the case due to many reasons that prevent this from happening.

In the literature, energy security has been introduced as an absolute aim that all countries alike strive to maximize; otherwise, it causes a reduction in their welfare or sovereignty (Johnson, 2016). As the current developments in Europe show, similar countries are differently ready to face uncertain energy security situations. What can explain differences in the level of natural gas prioritization and diversification? The most common explanation of differences in the prioritization of natural gas is based on fundamentals, expecting that economically wealthy countries will ascribe a lower priority to gas supplies than countries with smaller domestic resources. Nevertheless, this fundamental explanation does not provide an answer to why we observed such striking differences in gas prioritization and diversification among relatively similar countries in the Visegrad region. To control the effects of external conditions and isolate the effects of fundamentals, I look at the four in terms of gas supplies, structurally the most similar cases. Russian influence in these four Visegrad countries primarily aimed at dominating strategic sectors of their economy, which is the natural gas supplies. This justifies the selection of gas supplies in this research.

1.1. *Research Objective and Methodology*

This research employs process tracing and contribution analysis to examine causal relationships between structural variables and national energy policy outcomes in the Visegrad countries. Process tracing is applied to identify sequences of key events, including the 2006 and 2009 gas crises, EU accession, and the 2022 Russian invasion of Ukraine, and to map corresponding national policy responses. These responses are then systematically linked to independent variables, namely geographical proximity to Russia and inherited pipeline infrastructure.

Contribution analysis is used to assess the relative importance of these variables while accounting for intervening economic factors such as import dependency, market liberalization, infrastructure capacity, and access to alternative suppliers. The Visegrad countries are selected as the most similar systems design, sharing historical legacies and EU membership, while exhibiting variation in energy strategies. This combined approach enables the identification of causal mechanisms rather than simple correlations.

1.2. *First Hypothesis: Geographic proximity to Russia increases the likelihood of sustained dependence on Russian natural gas*

The geographical proximity in this context is not simply understood as sharing or not sharing a land or maritime border, but it is divided into 3 categories: (1) sharing a border with Russia's core territory, (2) sharing a border with any Russian territory and having one tier of countries between self and the core Russian territory, (3) having two tiers of countries between self and the core Russian territory (where the core is Russia without Kaliningrad, and Kaliningrad is considered as Russia's non-core territory).

The Visegrad countries with geographical proximity in the first category, sharing a land or maritime border with Russia's core territory, resulting in greater threat perception, than the Visegrad countries which have one or two tiers between themselves and the core Russian territory. The countries in the first category are more resistant to influence and are more actively searching for alternative suppliers. For these countries that share borders with Russia, the perception of a Russian threat is ubiquitous, with new fervor added to it by a series of events, from Russian intervention in Georgia (2008) to the Smolensk Air Crash in 2010 and the Crimean Annexation in 2014. Such countries have foreign policies focusing on improving cooperation among states that share a similar perception. In contrast, countries in the second and third categories, which do not share a border with Russia's core territory, tend to choose fewer pragmatic relations with Russia. However, in these countries, we see an explicit break in Western responses to Russia.

1.3. *Second Hypothesis: Existing Pipeline Infrastructure*

The presence of inherited Soviet-era pipeline infrastructure in the Visegrad countries reduces incentives to actively pursue alternative suppliers, as existing connections provide a convenient and historically embedded supply route. This structural convenience has contributed to the dominance of Russia as the primary gas supplier, reinforcing market concentration and limiting competitive pricing dynamics. As a result, long-term contracts have often been less favorable, contributing to comparatively higher energy costs.

At the same time, the energy mix in the Visegrad region has historically been less diversified than in Western Europe, increasing vulnerability to supply disruptions affecting a single dominant energy source. This risk is further amplified by the rigidity of pipeline-based import systems, which are less adaptable than liquefied natural gas (LNG) alternatives. Limited integration with Western European energy infrastructure has historically constrained diversification efforts, while insufficient access to alternative supply routes and storage capacity has heightened exposure to external shocks. Consequently, disruptions to pipeline flows can have significant economic and security implications for import-dependent states in the region.

This study builds on the concept of energy security as the reliable and affordable supply of energy resources under stable political and economic conditions. While traditional approaches emphasize geopolitical dependence and supply vulnerability, recent scholarship highlights the role of market structures, institutional frameworks, and diversification strategies in shaping outcomes. This paper contributes to the literature by arguing that structural factors such as geographic proximity and legacy infrastructure are not deterministic but are mediated by economic capacity, policy choices, and integration into European energy markets. By combining geopolitical and economic perspectives, the study develops a conditional framework for understanding energy dependence in Central Europe.

2. Czech Republic

The economic transformation of the Czech Republic proceeded relatively smoothly; however, the restructuring of the energy sector advanced more gradually and cautiously. Initially, privatization was primarily perceived as a mechanism to attract foreign capital (McMaster, 2006), technological expertise, and market access, although state intervention increased in later stages, influencing the process (Machková, 1994). Compared to other Visegrad countries, the Czech energy sector exhibited relatively low politicization of Russian presence and influence. Nevertheless, specific issues emerged as sensitive in public discourse, particularly in connection with formative events such as the construction of infrastructure projects or sector-specific facilities. Public and political debates reflected broader trends in Czech-Russian relations since the 1990s, being shaped by ideological orientations, the personal interests of key actors, and the overall political-security context of bilateral relations (Kratochvíl, 2004). As the Czech Republic experienced a relatively successful transformation and became the first in the region to diversify its energy import structure, critical political and public debates on energy-related issues remained comparatively limited (Dyba & Svejnar, 1994).

From a methodological perspective, this analysis applies process tracing to identify causal mechanisms linking theoretical expectations to empirical outcomes. The steps include: (1) specifying theoretical hypotheses regarding the relationship between geography, infrastructure, and energy dependency; (2) identifying observable implications of these hypotheses in the Czech case; (3) tracing decision-making processes, policy developments, and infrastructure investments over time; and (4) evaluating whether these empirical observations confirm, disconfirm, or refine the theoretical expectations. Complementing this, contribution analysis is used to assess the extent to which specific factors, such as domestic market structure, institutional capacity, and external partnerships, contributed to the observed deviation from the hypotheses, without assuming a single causal driver. This combined approach strengthens the methodological link between theory and evidence by systematically comparing expected and observed outcomes.

From the outset, Czech efforts to secure new gas supplies were marked by a pronounced emphasis on diversification. This finding contradicts the first hypothesis, which posits that countries geographically distant from Russia, and thus with a lower perception of threat, would exhibit less resistance to Russian influence and reduced initiative in seeking alternative suppliers. The Czech strategy was instead motivated by the unpredictability of Russian deliveries and growing security concerns, particularly in the context of the country's aspirations to join NATO. These concerns were compounded by protracted negotiations with Gazprom regarding supply agreements and pricing. Although Russian deliveries accounted for approximately 80 percent of annual consumption during the 2000s, diversification initiatives, such as the 1997 agreement between Transgas and Norway, enhanced national flexibility and represented the most significant diversification measure in the Visegrad region at the time (Gróf et al., 2024). For Norway, this agreement offered an advantageous entry point into the regional gas market (Brunclík, 2016).

The Czech deviation from the hypotheses can be further explained by domestic economic and institutional conditions. The country benefited from a relatively liberalized and financially stable market structure, a strong industrial base, and early integration into Western European markets. Additionally, the presence of experienced state-owned energy firms and regulatory institutions enabled more strategic planning and reduced vulnerability to external shocks. These factors provided both the capital capacity and institutional autonomy to pursue diversification, despite inherited Soviet-era infrastructure. Consequently, the Czech case demonstrates that domestic capability and market structure can outweigh geographic proximity in shaping energy policy decisions.

Subsequent infrastructure developments, including the Gazela pipeline inaugurated in 2013, further reinforced the Czech Republic's position as a key transit country for Nord Stream 1 supplies (Vlček, 2010). Additionally, geographic proximity to Germany and Austria facilitated diversification efforts and integration into broader European energy markets (Kořan, 2010). Accordingly, the second hypothesis, which assumes that post-Soviet pipeline infrastructure would limit diversification initiatives, is not supported in the Czech case, as officials actively pursued alternative suppliers despite the existing infrastructure (Holzer et al., 2020).

During the 1990s, Russian gas supplies reached substantial volumes, stabilizing the domestic market until the early 2000s. By 2006, Russian contracts covered approximately 8 bcm per year, supplemented by 3 bcm from Norwegian sources, yielding a total import capacity exceeding annual domestic consumption. Gas disputes between 2006 and 2009 had minimal impact on supply. The Czech government also deliberately avoided channeling exports through a single company, thereby mitigating risks associated with non-transparent trade. The limited prioritization of natural gas within national energy policy can be attributed to the Czech preference for domestic energy sources (Gotev, 2015). From 1993 onward, natural gas constituted a minor component of the energy mix, with the government favoring lignite coal and nuclear power. The 2015 national energy strategy reinforced this orientation, maintaining only a 15 percent share of gas in electricity generation (Ministerstvo průmyslu a obchodu, 2015).

In a broader perspective, Czech energy policy cannot be understood solely through the lens of fossil fuel security. Increasingly, energy strategies in the Visegrad region are shaped by climate change mitigation goals, ESG commitments, and EU-level regulatory frameworks. The historical diversification of gas supplies has indirectly contributed to current decarbonization

efforts by strengthening energy security and enabling a more flexible transition toward renewables. In this sense, earlier policy choices have facilitated alignment with contemporary sustainability objectives, rather than contradicting them. Finally, the post-February 2022 energy crisis and the EU's REPowerEU strategy have reshaped the original hypotheses. The assumption that geographic distance determines vulnerability has been partially redefined by the expansion of LNG infrastructure and alternative supply routes, which reduce dependence on traditional pipeline networks. Similarly, existing infrastructure is no longer a constraint in the same way, as reverse flows, LNG terminals, and market integration allow for greater adaptability. Therefore, the Czech case illustrates how evolving geopolitical and infrastructural conditions require a reinterpretation of earlier theoretical assumptions regarding proximity and dependency.

3. Slovakia

Slovakia's relations with Russia have historically constituted a significant component of its foreign policy. Compared to the early years following Slovak independence, the country has experienced notable developments in its orientation toward Russia (Bútorá & Bútorová, 1993). Initial expectations that Slovakia would fully align its foreign policy with Russian interests were moderated by 1998 (Baylis, 1998), when the country began to pursue integration with the European Union and NATO institutions (Wolchik, 1997). Nevertheless, several Slovak politicians, primarily from national-conservative and center-left parties, continued to frame Russia as a strategic partner or "big brother." Public opinion in Slovakia, however, remains sensitive to issues related to Russia, and bilateral relations continue to provoke domestic debate, though not to the intensity observed during the Mečiar administration (1994–1998).

From a methodological perspective, this case study employs process tracing to examine the causal mechanisms linking theoretical expectations to observed outcomes. The steps include: (1) specifying hypotheses concerning the relationship between geographic proximity, infrastructure legacy, and energy dependency; (2) identifying observable implications of these hypotheses in Slovak policy behavior; (3) tracing key political decisions, institutional changes, and supply developments over time; and (4) evaluating whether empirical evidence confirms or challenges the hypotheses. In parallel, **contribution** analysis is applied to assess the relative importance of explanatory factors such as political leadership, domestic governance structures, and transit-country status, allowing for a nuanced interpretation of Slovakia's deviation or alignment with theoretical expectations.

Despite Slovakia's geographic distance from the core Russian territory, the country's foreign policy scope has evolved. The Mečiar governments were characterized by a Russo-centric perception of the post-Soviet space, with limited attention to Ukraine; this stance has since shifted toward a more differentiated regional approach, supporting the first hypothesis (Zeniewski, 2019). However, the Slovak case also highlights how domestic political and institutional factors can override geographic assumptions. Centralized decision-making structures, weak regulatory independence in the 1990s, and close ties between political elites and energy-sector actors limited diversification incentives. The country's reliance on established Soviet-era contracts and transit revenues provided both economic stability and political inertia, reducing the urgency for structural change.

Domestic perceptions of threat further influenced policy. Low levels of public concern regarding Russia facilitated interaction between Slovak officials and Russian counterparts, some of whom subsequently entered the business sector. Given Russia's significant role in shaping Slovakia's energy dependence and security, the absence of widespread threat perception limited the impetus for prioritizing energy security measures, in contrast to developments in the Czech Republic (Naegele, 1997). At the same time, Slovakia's structural advantage as a major transit country for Russian gas generated both economic benefits and institutional path dependency, reinforcing continued cooperation with Gazprom.

Following independence, energy policy was strongly influenced by Mečiar's administration, particularly in terms of privatization and political-business networks. Under Dzurinda's government, priorities shifted toward fulfilling NATO and EU accession requirements, leaving energy security as a secondary concern, partly due to financial constraints related to reform implementation (Miklós, 2010). From an economic perspective, Slovakia's limited capital resources and dependence on transit revenues constrained its ability to invest in diversification infrastructure during the 1990s. Unlike the Czech Republic, Slovakia lacked both the financial flexibility and early strategic investment capacity to pursue alternative supply routes. As a result, domestic market structures and fiscal constraints reinforced continued reliance on Russian imports.

Slovakia's position as a key transit corridor for Russian gas contributed to a perception of stability, which discouraged proactive measures to enhance energy security. The country played a largely passive role in discussions concerning the Southern European Corridor, in contrast to the more active policies of the Czech Republic, Poland, and Hungary. This reflects a combination of institutional inertia and a lack of strategic diversification planning. Accordingly, the second hypothesis, which assumes that post-Soviet pipeline infrastructure constrains diversification, appears supported in the Slovak case, as existing infrastructure strongly shaped policy options and limited early diversification efforts.

From 1993 onward, Slovakia's natural gas policy was characterized by a generally passive approach, largely because existing Soviet-era supply contracts met domestic demand. Diversification of supply was not prioritized by successive governments,

including those of Mečiar, Moravčík, and Dzurinda, consistent with the second hypothesis. Gas volumes remained relatively stable throughout the 1990s, and new long-term contracts were not actively negotiated until 1998. During the Mečiar period, Slovakia's policies can be described as favorable to Russian interests; the country functioned as a reliable bilateral partner and intermediary for Gazprom, facilitating gas transit to Austria and Germany and establishing itself as a principal regional ally for Russia during the decade.

Subsequent developments indicate a gradual diversification of supply. By 2010, Slovakia had secured alternative natural gas sources, amounting to 1.38 bcm per year from suppliers such as GDF Suez, E.ON, and VNG. Discussions regarding dependence on Russian gas and strategies for mitigation intensified in 2009. Despite the withdrawal of an arbitration case in 2010 seeking compensation for prior supply interruptions, SPP continued negotiations with Gazprom to secure favorable pricing and contractual terms. The 2014 supply cutoff further underscored Slovakia's vulnerability and reinforced its commitment to strengthening energy security.

In the context of contemporary developments, Slovakia's historical dependency must also be understood in relation to EU climate policy, ESG commitments, and energy transition goals. The shift away from single-supplier dependence aligns with broader European efforts to decarbonize and diversify energy sources. While natural gas has historically played a stabilizing role, current policy frameworks emphasize renewable energy integration and reduced fossil fuel dependency. Slovakia's transition thus reflects not only security considerations but also alignment with long-term sustainability objectives.

Furthermore, the post-February 2022 energy crisis and the EU's REPowerEU strategy have significantly reshaped the theoretical assumptions underlying the original hypotheses. The role of geographic proximity has been partially redefined by the development of LNG infrastructure, reverse-flow capabilities, and diversified supply chains. Similarly, existing pipeline infrastructure, once a binding constraint, is now increasingly flexible due to market integration and infrastructural adaptation. Slovakia's experience illustrates how evolving geopolitical conditions and EU-level policy responses can alter the explanatory power of traditional variables such as proximity and infrastructure, requiring a re-evaluation of earlier theoretical expectations.

4. Hungary

Hungary has experienced a complex but strategically consistent trajectory in its energy policy and security since 1990. In the early years of transition, the country embraced privatization and liberalization in line with international economic expectations. However, after 2010, under the Fidesz government, Hungary made a deliberate shift toward reasserting stronger state control over the energy sector, ensuring that critical infrastructure and pricing policies prioritized Hungarian households and the national economy.

From a methodological perspective, this case study applies process tracing to examine the causal mechanisms linking theoretical expectations to empirical outcomes. The analytical steps include: (1) defining hypotheses regarding the effects of geographic proximity, infrastructure, and market structure on energy dependency; (2) identifying observable implications of these hypotheses in Hungary's policy evolution; (3) tracing key political, institutional, and market developments across time; and (4) assessing whether these developments confirm or challenge the hypotheses. Complementing this, contribution analysis is used to evaluate the relative importance of factors such as domestic market concentration, political stability, and state capacity, allowing for a nuanced understanding of Hungary's deviation from or alignment with theoretical expectations. The policies of the 1990s secured annual demand for natural gas, but liberalization placed pressure on domestic actors. MOL was required to sell imported gas at regulated prices, limiting its revenue and reducing its investment capacity in infrastructure and production. This reveals an important structural factor: Hungary's partially liberalized yet state-influenced market, which constrained private investment while maintaining state involvement in strategic sectors. These developments highlighted supply risks in the early 2000s. Concerns were also raised about foreign ownership, particularly Russian investment through Gazprom, during the privatization period. Governments across the political spectrum, Antall, Horn, and later Orbán, adopted different approaches, but the consistent objective was to protect Hungarian sovereignty while ensuring adequate supply.

Hungary's deviation from both theoretical hypotheses can be explained by its unique domestic market structure, political economy, and infrastructure advantages. Unlike other Visegrad countries, Hungary benefited from relatively dense interconnections and transit infrastructure, as well as a highly centralized energy governance model. These factors enabled a more flexible and controlled energy strategy. Additionally, Hungary's relatively strong fiscal position and the presence of a dominant national energy company (MOL) provided the capital and institutional capacity to negotiate favorable contracts and manage external dependencies effectively. This combination of state capacity, market concentration, and strategic flexibility allowed Hungary to pursue a pragmatic rather than reactive energy policy.

The return of the MSZP government in 2002 coincided with closer political and energy ties with Russia. During this period, intermediary companies such as Emfesz, Centrex, and RusUkrEnergo entered the Hungarian market, reflecting broader regional patterns of energy intermediation and reinforcing ties with Gazprom. Hungary's engagement with Russia as its

primary energy supplier was therefore not simply dependency, but a form of pragmatic interdependence, balancing security of supply with affordability and geopolitical flexibility. This aligns with Hungary's consistent "Hungary First" approach, which prioritizes national interests while maintaining selective openness to external partners.

From the outset, Hungary also actively pursued diversification. Early investments such as the HAG pipeline to Austria and contracts with Ruhrgas and Gaz de France demonstrate an effort to reduce overreliance on Russian supplies. The HAG pipeline, completed under Horn's government, enhanced Western integration, while subsequent diversification initiatives aimed to expand supply options beyond Russia. This strategy supports the first hypothesis only partially, as Hungary's proximity to alternative EU markets enabled diversification, but domestic political and economic considerations ultimately played a more decisive role than geographic distance.

Hungary's political system has provided stability, which has translated into continuity in energy policy across governments. Whether under right-leaning (MDF, Fidesz) or left-leaning (MSZP) administrations, core objectives remained consistent: ensuring security of supply, maintaining affordability, and protecting national interests. Under the Antall-led coalition, diversification efforts were initiated through Western partnerships. Under Horn, further infrastructure and contracts were developed, while the MSZP-SZDSZ coalition maintained strong ties with Russia through Panrusgas and long-term supply agreements. This continuity highlights how institutional stability and policy path dependency shaped Hungary's long-term strategy.

The Fidesz government of 1998 adopted a cautious stance toward Russian investments, ensuring that MOL remained protected during privatization (Lomax, 1999). During the 2000s, successive governments supported infrastructure projects aimed at diversification, including potential Caspian and Middle Eastern gas sources. Although different administrations varied in rhetoric, they consistently prioritized pragmatic engagement over ideological alignment. This is evident in Hungary's shifting position on projects such as South Stream, where Orbán reversed earlier opposition in favor of the project following the failure of Nabucco (Simon, 2012).

Hungary stands out in the Visegrad region as the only country to have avoided direct arbitration cases with Gazprom. It successfully renegotiated key agreements, including the Panrusgas contract in 2015, removing intermediary privileges and strengthening state control. Additionally, Hungary secured favorable pricing through negotiations with Gazprom subsidiaries and strengthened interconnection capacities, ensuring security of supply during crises (Hegedűs, 2016). By 2020, Hungary had eliminated restrictive "take-or-pay" clauses and consolidated its control over long-term contracts, demonstrating a high level of institutional and contractual resilience.

From an economic perspective, Hungary's approach reflects its ability to balance energy security, affordability, and sovereignty within a constrained market environment. Unlike the Czech Republic, Hungary relied more heavily on centralized control and long-term partnerships rather than rapid diversification. Its strategic use of intermediaries and negotiated agreements allowed it to stabilize supply while maintaining flexibility. This demonstrates how market structure and governance capacity can substitute for diversification in certain contexts.

In the context of modern developments, Hungary's historical reliance on natural gas must also be interpreted considering climate policy, ESG commitments, and EU decarbonization targets. While gas has historically served as a bridge fuel, Hungary's current energy strategy increasingly reflects the EU's climate agenda, including renewable energy expansion and emissions reduction targets. However, Hungary's continued reliance on long-term gas contracts illustrates the tension between energy security and sustainability goals, highlighting a gradual rather than abrupt transition.

Finally, the post-February 2022 energy crisis and the EU's REPowerEU strategy have reshaped the relevance of the original hypotheses. The role of geographic proximity has become less deterministic due to the expansion of LNG infrastructure, reverse-flow pipelines, and diversified supply chains. At the same time, Hungary's existing infrastructure and contractual arrangements have reinforced its ability to adapt to these changes without fundamentally altering its strategy. This suggests that while external shocks and EU-level policy initiatives redefine the variables of proximity and infrastructure, Hungary's long-standing emphasis on sovereignty, affordability, and pragmatism remains central to its energy policy trajectory.

5. Poland

Among the four Visegrad countries, the first hypothesis is most clearly supported in the case of Poland, primarily due to its shared border with Russian territory. Poland's geographical proximity to Russia contributed to a heightened perception of threat relative to the other Visegrad states, rendering the country more resistant to Russian influence and more proactive in seeking alternative energy suppliers. Although Russian actions never directly threatened Polish energy security, natural gas remained a salient issue on the national political agenda. Following the transformation in the early 1990s, Poland gained independence, yet its natural gas infrastructure and resources, inherited from the Soviet period, retained the potential for strategic leverage by Russia. Nonetheless, the legacy of a relatively stable Polish–Russian energy relationship persisted in subsequent years, particularly during the gas crises of 2006–2014, when bilateral relations displayed periods of both tension and pragmatic cooperation.

From a methodological standpoint, this case applies process tracing to identify the causal mechanisms linking theoretical expectations to empirical outcomes. The analytical steps include: (1) specifying hypotheses regarding how geographic proximity and infrastructure influence energy dependency and diversification; (2) identifying observable implications in Poland's policy choices; (3) tracing key political decisions, infrastructure investments, and external shocks over time; and (4) assessing whether empirical evidence supports, refutes, or refines the hypotheses. In parallel, contribution analysis is used to evaluate the relative importance of domestic political leadership, institutional capacity, and geopolitical constraints in shaping Poland's energy strategy, allowing for a more nuanced interpretation of causality.

Poland's political stance has often been assertive in both rhetoric and policy, including support for sanctions against Russia and the reinforcement of NATO presence in eastern territories. However, energy security was not uniformly prioritized across all administrations. For instance, the SLD governments led by Oleksy and Cimoszewicz in the early 1990s, as well as later SLD administrations under Miller and Belka, exhibited comparatively limited focus on energy security (Wojtasik, 2014). This variation highlights the importance of domestic political orientation and leadership priorities in shaping energy policy outcomes, alongside structural factors such as geography.

Poland's deviation from the second hypothesis, despite the presence of Soviet-era pipeline infrastructure, can be explained by a combination of institutional capacity, strategic culture, and early investment in diversification. Unlike Slovakia or Hungary, Poland actively prioritized energy security as a core component of national sovereignty, enabling early mobilization of resources and policy coordination. Additionally, Poland's relatively large domestic market and access to financial and EU support enhanced its capacity to invest in infrastructure projects and long-term diversification strategies. These factors reduced the constraining effect of existing Soviet infrastructure and enabled a forward-looking approach to energy policy.

Despite this infrastructure legacy, Polish officials actively pursued diversification of supply. In 1992, Poland secured alternative natural gas supplies from the North Sea via Denmark. Subsequently, in 1996, PGNiG and Norway's Statoil concluded agreements establishing both small and large-scale supply contracts, including an eight-year agreement that enhanced supply stability. By 2005, Poland initiated plans to construct an LNG terminal in Świnoujście, which later became a cornerstone of its diversification strategy. This terminal enabled Poland to access global LNG markets, significantly reducing its dependence on Russian gas.

In parallel, Poland expanded its network of interconnections with neighboring countries, including the Czech Republic, Slovakia, Lithuania, Ukraine, Denmark, and Germany. These developments not only increased supply flexibility but also strengthened Poland's role as a regional energy hub. From an economic perspective, these investments were supported by EU funding mechanisms and access to capital markets, demonstrating how external financial support can reinforce national energy strategies and accelerate diversification.

In the context of broader regional trends, Poland's energy policy has evolved alongside increasing emphasis on energy security, climate policy, and ESG commitments. While natural gas continues to play a transitional role, Poland has increasingly invested in renewable energy and energy efficiency measures in line with EU climate targets. The historical emphasis on diversification has thus contributed not only to energy security but also to long-term sustainability goals, illustrating the convergence of security and environmental policy objectives.

Finally, the post-February 2022 energy crisis and the EU's REPowerEU strategy have further reinforced Poland's long-standing approach. The role of geographic proximity has been partially redefined by the expansion of LNG infrastructure, pipeline interconnections, and alternative supply routes. Poland's early investment in the Świnoujście LNG terminal and its Baltic Pipe project has positioned it as a leader in regional diversification. These developments demonstrate how Poland's strategy anticipated and adapted to shifts in the European energy landscape, reducing vulnerability to external shocks.

Overall, the Polish case provides strong support for the first hypothesis, while simultaneously challenging the second. It illustrates that although infrastructure and geography are important, domestic political priorities, institutional capacity, and strategic investment decisions play a decisive role in shaping energy outcomes. Poland's proactive diversification strategy, combined with its geopolitical position and access to financial resources, enabled it to transform structural constraints into opportunities for enhanced energy security and regional leadership.

6. Conclusion

This study demonstrates that while geographical proximity to Russia and inherited pipeline infrastructure remain important determinants of energy dependence, their effects are conditional rather than deterministic. Economic capacity, market liberalization, political priorities, and access to alternative infrastructure significantly mediate national outcomes. The Czech Republic illustrates how early institutional reform, favorable geographic positioning, and strong market integration can reduce structural vulnerability, partially challenging conventional assumptions about path dependency. Poland, by contrast, confirms the strong influence of threat perception in shaping proactive diversification strategies. Slovakia and Hungary demonstrate more path-dependent and infrastructurally constrained patterns, though both cases also reveal important instances of adaptation and strategic flexibility.

The findings contribute to energy security literature by integrating geopolitical and economic perspectives into a unified analytical framework. They suggest that energy dependence should be understood as a dynamic outcome shaped by policy choices, institutional capacity, and market conditions rather than fixed structural constraints.

Post-2022 developments further reinforce this conclusion. The expansion of LNG infrastructure and the implementation of EU-level strategies such as REPowerEU have reduced the rigidity of pipeline-based dependency and increased supply flexibility. As a result, energy security in Europe is increasingly shaped by global market integration and policy-driven diversification. However, the degree to which countries can benefit from these changes still depends on their domestic capacities, infrastructure readiness, and strategic positioning.

From a policy perspective, the results highlight the importance of continued investment in diversification, market integration, and sustainable energy transitions. In the long term, decarbonization and ESG-driven strategies are likely to further diminish the role of fossil fuel dependencies in shaping geopolitical vulnerability, although the pace and form of this transition will vary across countries.

6.1 Results

In this research, the Visegrad region is conceptualized as an intermediate geopolitical “corridor” between the West and Russia, not only in geographical terms but also across security, economic, and political dimensions. Its strategic relevance stems from its dual role as both a transit zone and a consumption region within European energy networks. The analysis applies a structured framework to explain variation in natural gas supply strategies across the Visegrad countries, focusing on the interaction between geographical proximity, inherited infrastructure, and mediating economic and policy variables. The findings indicate that while structural conditions shape initial trajectories, national responses diverge significantly depending on institutional capacity, market structures, and strategic decision-making.

6.2 Geographical Proximity

Among the four Visegrad countries, Poland most clearly supports the first hypothesis, owing to its shared border with Russian territory. Geographic proximity heightened Poland’s perception of threat relative to the other Visegrad states, fostering greater resilience to Russian influence and prompting active efforts to secure alternative gas supplies. Natural gas remained a salient issue in national policy, reflected in both diversification initiatives and broader geopolitical positioning, including support for sanctions and NATO reinforcement. However, the prioritization of energy security varied across political administrations, indicating that proximity alone does not fully determine policy outcomes.

In contrast, the Czech Republic represents a deviant case that challenges the first hypothesis. Despite lacking direct geographical proximity to Russia, the country pursued early and proactive diversification strategies. This outcome is best explained by a combination of early market liberalization, favorable geographic positioning near Western European markets, and access to alternative infrastructure. Rather than low threat perception leading to passivity, Czech policy was shaped by forward-looking economic and institutional considerations, particularly in the context of NATO and EU accession.

Slovakia and Hungary, while not directly bordering Russia, demonstrate more nuanced patterns. In Slovakia, early foreign policy orientations reflected limited prioritization of energy security, consistent with lower perceived threat and strong reliance on existing supply structures. However, this position evolved over time, particularly after critical supply disruptions, indicating a conditional alignment with the first hypothesis. Hungary, by contrast, demonstrates that the absence of direct geographical proximity enabled a flexible and pragmatic “open–close” strategy, balancing engagement with Russia and diversification efforts. Rather than reducing threat perception, Hungary’s policy was driven primarily by domestic priorities such as affordability, sovereignty, and state control. Overall, the findings suggest that geographical proximity influences threat perception, but its effects are strongly mediated by political and economic factors.

6.3 Existing Pipeline Infrastructure

The second hypothesis posits that inherited Soviet-era pipeline infrastructure reduces incentives to actively pursue alternative suppliers due to the convenience and reliability of established supply routes. The findings provide only partial and highly differentiated support for this hypothesis across the Visegrad region.

In Poland, the hypothesis is clearly rejected. Despite the presence of Soviet-era infrastructure, Polish authorities actively pursued diversification from the early 1990s onward. Initiatives such as agreements with Norway, interconnections with

neighboring countries, and the development of the LNG terminal in Świnoujście demonstrate that strong threat perception, strategic policy choices, and access to external financing can override infrastructural constraints.

Similarly, the Czech Republic does not conform to the second hypothesis. Despite inheriting pipeline infrastructure, the country actively diversified its gas supply, facilitated by geographic proximity to Western markets and early liberalization reforms. The deliberate avoidance of single-supplier dependency and the relatively minor role of natural gas in the energy mix reduced the constraining effects of infrastructure. This further reinforces the argument that infrastructure alone is not determinative.

By contrast, Slovakia more closely aligns with the second hypothesis. In the post-independence period, existing pipeline connections and long-term supply arrangements reduced incentives for diversification. Political leadership did not prioritize alternative supply routes, reflecting both structural convenience and economic benefits associated with transit revenues. Only after external shocks, particularly the 2009 gas crisis, did Slovakia significantly adjust its strategy, investing in reverse-flow capabilities and regional interconnections. This illustrates how infrastructure can shape policy inertia, but also how crisis events can alter its influence.

Hungary also provides partial support for the second hypothesis, but with important qualifications. The continued reliance on established pipeline systems, combined with long-term contractual arrangements and strong state involvement in the energy sector, reduced incentives to pursue rapid diversification. However, unlike Slovakia, Hungary simultaneously maintained a high degree of strategic flexibility, renegotiating contracts and strengthening interconnections. This demonstrates that infrastructure may constrain policy but does not necessarily eliminate agency.

Overall, the findings indicate that while inherited pipeline infrastructure tends to discourage diversification, its effects are highly contingent on threat perception, economic capacity, and policy choices. In cases where these mediating factors are strong, countries can overcome structural constraints.

6.4 *The Visegrad Region's Gas Market After February 2022*

The Russian invasion of Ukraine in February 2022 marked a critical turning point in European energy policy, significantly altering the structural conditions underpinning natural gas supply in the Visegrad region. The crisis accelerated the restructuring of energy supply chains, reducing the relevance of traditional pipeline dependency and increasing the importance of diversification and market flexibility.

European responses, including the International Energy Agency's action plan and the European Commission's REPowerEU strategy, have focused on reducing dependence on Russian gas, expanding LNG capacity, and strengthening energy resilience. These measures have weakened the rigidity associated with pipeline-based systems and enhanced access to global gas markets. However, they have also introduced new challenges, including higher energy prices, increased volatility, and fiscal pressures on governments.

Liquefied natural gas has emerged as a key alternative to Russian pipeline supplies, although at significantly higher cost. While market conditions have stabilized relative to the initial shock, long-term uncertainty remains linked to global demand, supply constraints, and external factors such as weather and Asian market dynamics.

Despite these changes, structural legacies continue to shape regional dynamics. Russia remains an important supplier in certain segments, and existing infrastructure constraints still limit the full integration of alternative supply routes. The development of the North–South gas corridor represents a critical step toward improving regional connectivity and diversification. EU-supported infrastructure investments have enhanced the bargaining position of Visegrad countries, though gaps in interconnection capacity persist.

Country responses vary significantly. Poland has emerged as the most proactive actor, leveraging LNG infrastructure, global partnerships, and its LNG terminal to decouple from Russian supply, effectively confirming the first hypothesis while transcending the second. The Czech Republic continues to benefit from its early diversification and strong integration into Western markets, further reinforcing its deviation from infrastructure constraints. Slovakia, in contrast, has accelerated diversification primarily in response to crisis pressures, partially confirming both hypotheses under new conditions. Hungary maintains a pragmatic and state-controlled strategy, adapting to new conditions while preserving elements of its earlier model, thus demonstrating continuity rather than transformation.

In the long term, the post-2022 environment underscores a broader transformation: energy security in the Visegrad region is increasingly shaped by policy-driven diversification, global market integration, and infrastructure modernization, rather than by fixed geographical and historical constraints alone.

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Conflict of Interest

The author declares no conflict of interest. All analyses and interpretations presented in this study were conducted objectively, without any personal or financial interests that could influence the reported results.

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