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Geography of Energy Sovereignty in Europe

Geografia suwerenności energetycznej w Europie

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Geography of Energy Sovereignty in Europe

Energy sovereignty within the European Union (EU) has been undergoing significant transformation due to the intersecting pressures of climate policy, market integration, and geopolitical instability. Although article 194(2) of the Treaty on the Functioning of the European Union affirms the authority of the member states to determine their energy mix, recent initiatives such as the Fit for 55 package, the REPowerEU Plan, and solidarity mechanisms for gas and electricity have increased EU's influence over national energy strategies. This paper examines the operation of sovereignty within this evolving framework of interdependence. Its authors contend that energy sovereignty in the EU has shifted from an absolute concept to a negotiated competence, mediated by legal, financial, and infrastructural interconnections.

Geografia suwerenności energetycznej w Europie

Suwerenność energetyczna w Unii Europejskiej przechodzi istotną transformację w wyniku nakładających się presji związanych z polityką klimatyczną, integracją rynku oraz niestabilnością geopolityczną. Chociaż art. 194 ust. 2 *Traktatu o funkcjonowaniu Unii Europejskiej* potwierdza uprawnienia państw członkowskich do określania własnego miksu energetycznego, ostatnie inicjatywy, takie jak pakiet Fit for 55, plan REPowerEU oraz mechanizmy solidarnościowe dla gazu i energii elektrycznej, zwiększyły wpływ UE na krajowe strategie energetyczne. Niniejszy artykuł analizuje funkcjonowanie suwerenności w tym ewoluującym systemie współzależności. Artykuł dowodzi, że suwerenność energetyczna w UE przeszła od klauzuli generalnej do kompetencji negocjowanej, kształtowanej przez powiązania prawne, finansowe i infrastrukturalne.

Introduction

Article 194(2) of the Treaty on the Functioning of the European Union (TFEU) states that a member state has a right to “determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply.”¹ This provision enshrines the principle of subsidiarity in EU energy law and protects national discretion in energy matters.

Recent developments in EU climate and energy governance are increasingly perceived as limiting the scope of national discretion. The formal recognition of energy sovereignty under article 194(2) TFEU is simultaneously challenged and re-shaped by the functional logic of EU integration, particularly where market harmonisation and decarbonisation goals intersect.²

These reforms expand EU financial and regulatory interdependence between supranational frameworks and national policies, such as support schemes for renewable energy. Consequently, national competences in energy support policy are increasingly shaped by EU-level objectives. This results in a *de facto*, and increasingly *de iure*, recalibration of the balance of powers outlined in article 194 TFEU.³

At the institutional level, the internal market framework, as structured by article 194(1) TFEU, has enabled regulatory bodies and operators to play a growing role in shaping energy governance. For example, the Clean Energy for All Europeans package assigns distribution system operators the role of neutral market facilitators, thereby requiring real-time balancing of supply and demand while integrating renewable energy. Although such actions

- 1 European Union, “Treaty on the Functioning of the European Union. Consolidated Version of the Treaty on the Functioning of the European Union,” *Official Journal of the European Union*, 26 October 2012.
- 2 Kaisa Huhta, “The Scope of State Sovereignty under article 194(2) TFEU and the Evolution of EU Competences in the Energy Sector,” *International and Comparative Law Quarterly* 70, No. 4 (2021): 991–1010, accessed 31 May 2026, <https://doi.org/10.1017/S0020589321000269>; Andreas Goldthau, and Nick Sitter, *A Liberal Actor in a Realist World: The European Union Regulatory State and the Global Political Economy of Energy* (Oxford: Oxford University Press, 2015).
- 3 Theodoros G. Iliopoulos, “The Role and Competence of the EU in the Area of Supportive Financing Policies for Renewable Energy Projects,” *European Papers* 9, No. 3 (2024): 1268–1295, accessed 31 May 2026, <https://doi.org/10.15166/2499-8249/809>.

promote coherence and competition, they also raise concerns over legitimacy, particularly when institutional transitions are not matched by adequate proportionality mechanisms.⁴ Laura Kaschny observes that these evolving responsibilities highlight the importance of the internal market guiding principle with regard to the clarification of responsibilities and reconciliation of transitional tensions, especially as decentralisation challenges legacy governance structures.

In particular, member states with distinctive energy profiles such as Poland with its coal legacy and nuclear ambitions; France with its reliance on and the leadership in nuclear leadership; Hungary with its bilateral energy ties to Russia; and Germany with its renewables-focused *Energiewende* have articulated divergent visions of how national sovereignty should be reconciled with European solidarity. This article examines these tensions by addressing two central questions: To what extent do EU-level energy-climate instruments reshape or constrain member states' sovereignty under Article 194(2) TFEU? Which governance models could plausibly reconcile solidarity with subsidiarity in the future?

In this way, the paper contributes to contemporary debates in EU constitutional law, energy governance, and theories of European integration and multi-level governance, including federalist, neo-functionalist, and Putnam's two-level game approaches – by developing a typology of legal and strategic tensions between integrationist logic and sovereign prerogatives in the European energy transition.⁵

EU legal and institutional instruments reshaping national energy sovereignty

The EU's climate agenda has moved beyond environmental ambition to become a *de facto* architecture for the recentralisation of energy competences. The second EU Emissions Trading system (ETS2), the Carbon Border Adjustment Mechanism (CBAM), and the Joint European Action for

4 Laura Kaschny, "Energy Justice and the Principles of Article 194(1) TFEU Governing EU Energy Policy," *Transnational Environmental Law* 12, No. 2 (2023): 270–294, accessed 31 May 2026, <https://doi.org/10.1017/S2047102523000110>.

5 Robert D. Putnam, "Diplomacy and Domestic Politics: The Logic of Two-Level Games," *International Organization* 42, No. 3 (1988): 427–460.

more affordable, secure and sustainable energy (REPowerEU) mechanisms do not merely facilitate climate mitigation. They reconfigure the legal geography of sovereignty in the energy domain. While Article 194(2) TFEU safeguards the right of the member states to determine their energy mix, recent developments show a steady growth of EU competences through climate and market legislation.⁶

One of the central pillars of this expansion is the Emissions Trading System (ETS), which has been progressively broadened under the Fit for 55 package.⁷ The creation of ETS2 for buildings and road transport extends EU-level carbon pricing to sectors historically regulated at the national level. Complementing this internal instrument is CBAM, which requires importers of carbon-intensive goods to purchase certificates reflecting the carbon price that would have been paid had the products been manufactured under the EU's ETS. By aligning external trade with EU climate objectives, CBAM not only mitigates carbon leakage but also imposes a uniform regulatory model that limits the space for member states to design alternative approaches.⁸

In the fiscal domain, the REPowerEU plan, embedded in the Recovery and Resilience Facility (RRF), links access to EU funding with the implementation of reforms and investments aligned with decarbonisation and energy diversification. This conditionality introduces an indirect but powerful mechanism of influence for the European Commission over national energy strategies, as financial support is tied to the fulfilment of EU-level priorities.⁹

Institutionally, the Agency for the Cooperation of Energy Regulators (ACER) has become central in monitoring cross-border electricity and gas

6 Huhta, "The Scope."

7 European Commission, *Fit for 55: Delivering the EU's 2030 Climate Target on the Way to Climate Neutrality. Communication from the Commission* (Brussels: 2021).

8 European Union, "Regulation (EU) 2023/956 of the European Parliament and of the Council of May 10, 2023, Establishing a Carbon Border Adjustment Mechanism," *Official Journal of the European Union* L 130 (2023): 52–104, accessed 31 May 2026, <https://eur-lex.europa.eu/eli/reg/2023/956/oj/eng>.

9 European Commission, *REPowerEU Plan, Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions* (Brussels: 2022), accessed 31 May 2026, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022DC0230>.

markets. Its binding decisions on capacity allocation and cross-border infrastructure create a framework within which national regulators must operate, reducing their unilateral discretion. Similarly, the European Network of Transmission System Operators for Electricity (ENTSO-E), through its Ten-Year Network Development Plan (TYNDP), directly shapes infrastructure choices by defining priority projects eligible for EU support.

The REMIT Regulation (Regulation No. 1227/2011) further illustrates the EU's reach into national systems by imposing obligations of transparency and prohibiting insider trading in wholesale energy markets.¹⁰ While designed to safeguard fairness, these obligations apply directly to market actors within member states and exemplify the supranationalisation of regulatory standards in the energy field. This does not formally remove sovereignty under article 194(2) TFEU. It recalibrates the balance between national discretion and supranational authority in practical governance.

Although the article focuses primarily on EU energy law and governance, selected references to NATO that are used are justified by the growing convergence between energy security and collective security. Since the 2016 Warsaw Summit, the 2021 Brussels Summit, and especially the 2022 NATO's Strategic Concept, resilience of critical infrastructure, energy security, cybersecurity, and societal preparedness have become increasingly integrated into NATO's understanding of security.¹¹ Consequently, the notion of an *Energy NATO* is analysed not as a proposal for institutional transfer to NATO structures, but as a conceptual benchmark for assessing the degree of solidarity and mutual assistance that may emerge within EU energy governance.

10 European Union, "Regulation (EU) No. 1227/2011 of the European Parliament and of the Council of October 25, 2011, on Wholesale Energy Market Integrity and Transparency," *Official Journal of the European Union* L 326 (2011): 1–16, accessed 31 May 2026, <http://data.europa.eu/eli/reg/2011/1227/oj>.

11 North Atlantic Treaty Organization, *Warsaw Summit Communiqué* (2016), accessed 31 May 2026, <https://www.nato.int/en/about-us/official-texts-and-resources/official-texts/2016/07/09/warsaw-summit-communication>; North Atlantic Treaty Organization, *Brussels Summit Communiqué* (2021), accessed 31 May 2026, <https://www.nato.int/en/about-us/official-texts-and-resources/official-texts/2021/06/14/brussels-summit-communication>; North Atlantic Treaty Organization, *NATO 2022 Strategic Concept* (2022), accessed 31 May 2026, <https://www.nato.int/content/dam/nato/webready/documents/publications-and-reports/strategic-concepts/2022/290622-strategic-concept.pdf>.

National strategies and European constraints

The European energy transition comprises diverse national responses shaped by historical context, resource endowments as well as economic and political priorities. Each member state interprets energy sovereignty differently, balancing domestic autonomy with the requirements of integration within a shared European framework.

This section examines four contrasting national models – Poland, France, Germany, and Hungary – to illustrate the practical manifestations of national energy sovereignty. These cases demonstrate that sovereignty is not a static condition but a negotiated process, continually redefined by the interplay of EU rules and domestic politics.

Poland – between coal dependence and nuclear aspirations

Poland remains the most coal-reliant country in the EU, with coal accounting for about 56% of its electricity generation in 2024.¹²

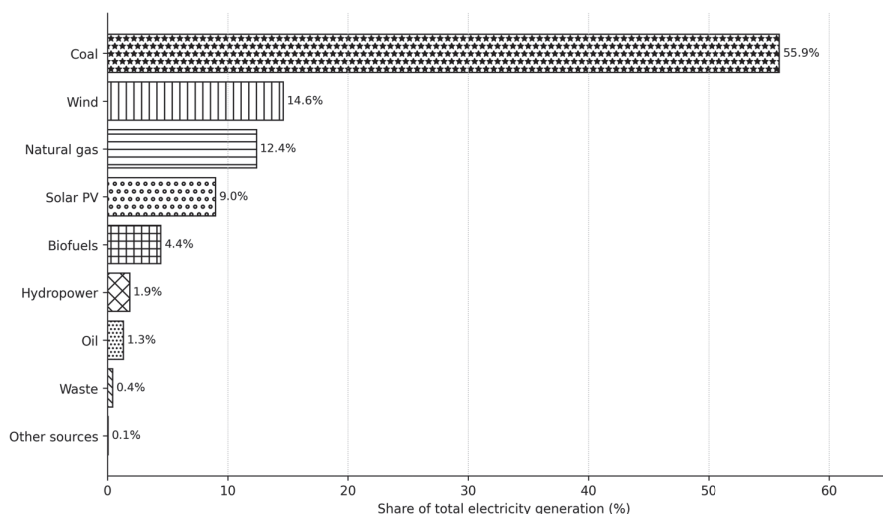


Figure 1. Electricity generation sources, Poland, 2024

Source: International Energy Agency, *Sources of Electricity Generation: Poland*, accessed 29 March 2026, <https://www.iea.org/countries/poland/electricity>

12 Marcin Dusiło and Kacper Kwidziński, *Transformacja energetyczna w Polsce. Edycja 2025* (Warszawa: Forum Energii, 2025).

This dependence on coal has placed the government in Warsaw in a structurally vulnerable position as the EU accelerates decarbonisation under the Fit for 55 package. Poland has consistently emphasised its sovereign right under article 194(2) TFEU to determine its energy mix, invoking energy security and socio-economic stability as justifications for a slower transition pace.¹³

At the same time, the Polish government has launched a long-term strategy for diversifying energy sources and supply routes. According to Poland's new proposal for the National Energy and Climate Plan, presented on 17 December 2025, the country is expanding onshore and offshore wind capacity, investing in solar photovoltaics, and, most significantly, developing a nuclear power programme, with the first reactor expected to be operational in the mid-2030s. Poland's strategy is both a question of domestic planning and structurally tied to EU financial instruments. Since 2023, disbursements from the Modernisation Fund and other European Union funding instruments have been critical in financing renewable deployment, grid upgrades, and energy transition.¹⁴

The conditional nature of this funding, however, means that national priorities are increasingly shaped by EU eligibility rules. This interdependence generates a paradox. While Poland invokes article 194(2) TFEU to defend its sovereign right to define its energy mix, in practice the direction and pace of its transition are largely determined by access to European funds. Thus, Poland exemplifies how financial conditionality operates as a *de facto* governance mechanism, constraining the practical scope of sovereignty in the energy sector.

France – nuclear leadership and policy influence

France's energy profile is dominated by nuclear power, which accounted for about 67% of electricity generation in 2024, underscoring its role as the backbone of the national energy mix.¹⁵

13 Huhta, "The Scope."

14 Jakub Kubiczek et al., "Going beyond Frontiers in Household Energy Transition in Poland – a Perspective," *Frontiers in Energy Research* 11 (2023), accessed 31 May 2026, <https://doi.org/10.3389/fenrg.2023.1239115>.

15 Réseau de transport d'électricité, *Bilan électrique 2024, 2025*, accessed 29 March 2026, <https://analysesetdonnees.rte-france.com/bilan-electrique-2024/synthese>.

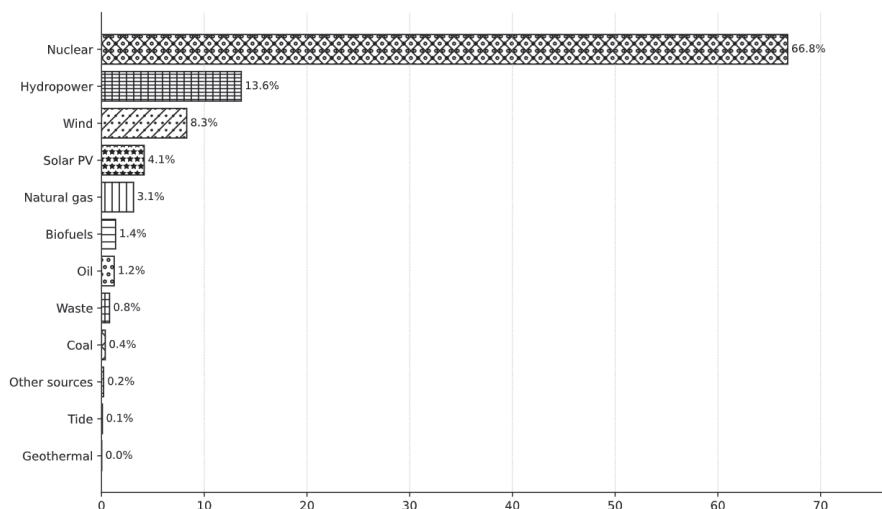


Figure 2. Electricity generation sources, France, 2024

Source: International Energy Agency, *Sources of Electricity Generation: France*, accessed 29 March 2026, <https://www.iea.org/countries/france/electricity>

France frames nuclear energy as a pillar of national sovereignty, thereby insulating it from fossil-fuel price volatility and dependence on foreign suppliers. At the same time France has placed less emphasis on the expansion of renewable energy than other member states.¹⁶ At the EU level, France has strongly advocated the inclusion of nuclear energy in the taxonomy of environmentally sustainable investments. In 2022, France secured an important victory when the Complementary Climate Delegated Act classified nuclear as a transitional activity.¹⁷

This development demonstrates how a member state tried to leverage its misaligned energy model to reshape EU policy outcomes.¹⁸

16 France was the only EU member state that failed to meet its 2020 renewable energy target for the share of renewables in gross final energy consumption.

17 Stefano Spinaci, *EU Taxonomy: Delegated Acts on Climate, and Nuclear and Gas* (European Union: European Parliament, 2022), accessed 30 August 2026, [https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/698935/EPRS_BRI\(2022\)698935_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/698935/EPRS_BRI(2022)698935_EN.pdf).

18 Aleksandra Gawlikowska-Fyk et al., "Zależności między polityką integracyjną Francji a rozwojem europejskiej polityki energetycznej," *Sprawy Międzynarodowe* 75, No. 3-4 (2022): 47-74, accessed 31 May 2026, <https://doi.org/10.35757/SM.2022.753-4.03>.

Yet, the French nuclear sector also faces a structural dilemma: despite its dominant share, the system is challenged by ageing infrastructure and substantial investments required both to extend the operating lives of existing reactors and to construct new ones.

Maintaining nuclear dominance will require unprecedented capital mobilisation to extend the life of nuclear plants.¹⁹ Moreover, the financing of these projects increasingly depends on access to EU-level instruments such as taxonomy-based investment criteria, which condition private and institutional capital flows. EU framework clearly prioritises renewables. This linkage underscores a paradox: while France asserts nuclear power as a foundation of national sovereignty, the viability of its strategy is shaped by European regulatory and financial frameworks. In this sense, French sovereignty in the energy domain is reinforced technologically but constrained institutionally, reflecting the broader tension between autonomy and integration in the EU's climate transition.

Germany – Energiewende, dependency, and European spillovers

For more than two decades, Germany's energy strategy has been defined by the *Energiewende*, a policy paradigm centred on the expansion of renewable energy and the phase-out of nuclear power and coal.

The nuclear exit was completed in April 2023, when the last three reactors were disconnected from the grid, marking a symbolic milestone in Germany's decarbonisation efforts.²⁰ On coal, the federal Coal Phase-Out Act still sets a 2038 deadline, though a 2022 agreement between the federal government, the state of North Rhine-Westphalia, and the energy company RWE brought it forward to 2030.²¹

19 America Hernandez, "EDF to Spend Estimated \$7 Billion on Extending Life of Nuclear Plants," *Reuters*, 3 July 2025, accessed 31 May 2026, <https://www.reuters.com/sustainability/boards-policy-regulation/edf-spend-estimated-7-billion-extending-life-nuclear-plants-2025-07-03/>.

20 Federal Office for the Safety of Nuclear Waste Management, *The Nuclear Phase-Out in Germany*, 31 January 2024, accessed 29 March 2026, https://www.base.bund.de/en/nuclear-safety/nuclear-phase-out/nuclear-phase-out_content.html.

21 Agora Energiewende, *What Are Germany's Nuclear, Coal and Fossil Gas Phase-Out Strategies?*, 18 February 2025, accessed 29 March 2026, <https://www.agora-energie-wende.org/about-us/the-german-energie-wende/what-are-germanys-nuclear-coal-and-fossil-gas-phase-out-strategies>.

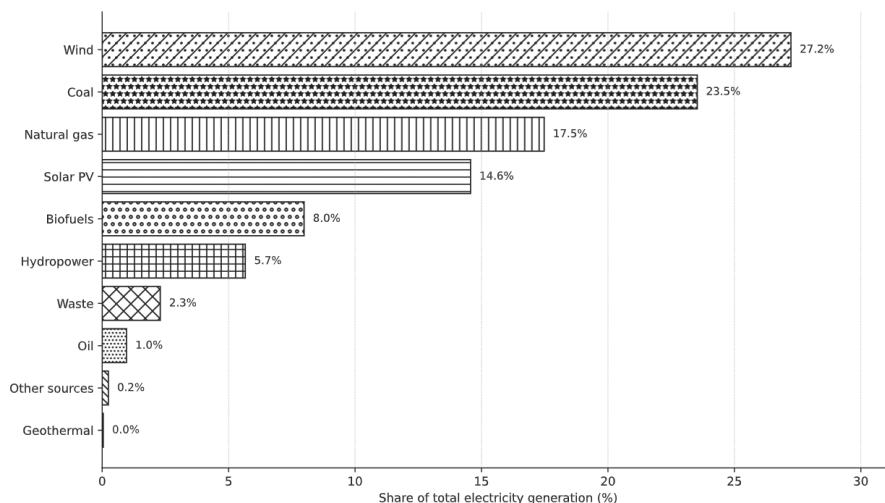


Figure 3. Electricity generation sources, Germany, 2024

Source: International Energy Agency, *Sources of Electricity Generation: Germany*, accessed 29 March 2026, <https://www.iea.org/countries/germany/electricity>

Only in response to disruptions to pipeline gas supplies, following Russia's full-scale invasion of Ukraine, did Germany decide to build LNG terminals. According to the *Bundesnetzagentur* data, these terminals provided about 7% of Germany's total gas imports in 2023.²² The sharp reduction in the supply of Russian gas from September 2022 prompted Germany to increase imports from Norway, the Netherlands, and Belgium in order to mitigate potential shortages. As a consequence, electricity generation from gas-fired power plants declined by approximately 14% year on year, while generation from lignite increased by just over 5% and that from hard coal by approximately 14%.²³

At the EU level, Germany has positioned itself as a proponent of deeper market integration. ENTSO-E's TYNDP 2024 Infrastructure Gas Report identifies that cross-border capacity reinforcements are beneficial

22 Bundesnetzagentur, *Bundesnetzagentur Publishes Gas Supply Figures for 2023*, 4 January 2024, accessed 29 March 2026, https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/EN/2024/20240104_Gasversorgung2023.html.

23 Bundesnetzagentur, *Monitoringbericht 2023* (Bonn: 2023), accessed 31 May 2026, <https://data.bundesnetzagentur.de/Bundesnetzagentur/SharedDocs/Mediathek/Monitoringberichte/MonitoringberichtEnergie2023.pdf>.

on half of European borders, especially on German borders. Moreover, the TYNDP shows that investment in cross-border infrastructure will continue to expand, with significant needs in transmission interconnectors and hybrid offshore corridors connecting Germany with neighbouring countries.²⁴ Common EU rules governing renewables support, help create a more level playing field between Germany and other member states. Only when the gas supply security came under threat did Germany embrace the EU's joint gas-purchasing mechanism as codified in Regulation (EU) 2022/2576, which establishes AggregateEU to pull demand. The regulation requires undertakings, established in member states with underground gas storage facilities, to participate in the demand-aggregation process for volumes equivalent to at least 15% of those needed to meet the storage-filling targets.²⁵ This instrument is designed as a solidarity mechanism, intended to strengthen security of supply, reduce competition among member states for supplies, and enhance their bargaining power in external gas markets.

Taken together, these developments illustrate a challenge in German energy sovereignty. On the one hand, *Energiewende* reflects a deliberate national choice to pursue a renewable-based system while phasing out nuclear and coal. On the other, as shown in TYNDP studies, the viability of this trajectory increasingly depends on the cross-border market integration, supranational regulatory oversight through EU regulations such as 2022/2576, and EU solidarity mechanisms.

Hungary – sovereignty through external alliances

Hungary pursues an energy policy that heavily relies on external bilateral contracts and strategic national projects, even as it remains part of EU regulatory and funding frameworks.

At the same time, some of the Hungarian government's activities are in contradiction with European solidarity mechanisms. In September 2021, Hungary signed a 15-year natural gas supply contract with Gazprom,

24 ENTSO-E, *Opportunities for a More Efficient European Power System by 2050 – Infrastructure Gaps Report* (2025).

25 European Union, "Council Regulation (EU) 2022/2576 of December 19, 2022, Enhancing Solidarity through Better Coordination of Gas Purchases, Reliable Price Benchmarks and Exchanges of Gas across Borders," *Official Journal of the European Union* L 335 (2022): 1–35.

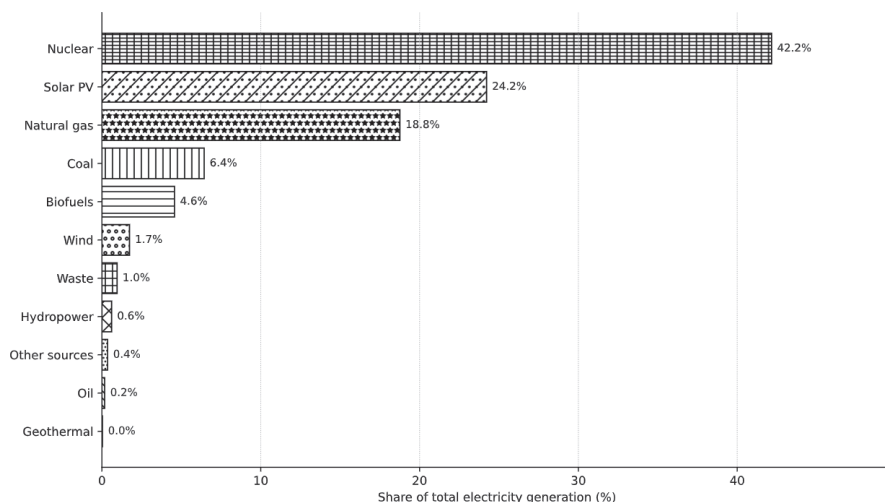


Figure 4. Electricity generation sources, Hungary, 2024

Source: International Energy Agency, *Sources of Electricity Generation: Hungary*, accessed 29 March 2026, <https://www.iea.org/countries/hungary/electricity>

with annual deliveries of approximately 4.5 billion cubic metres, sent via the Serbia-Hungary and Austria-Hungary pipelines, thereby bypassing transit through Ukraine.²⁶ In August 2022, the Hungarian Atomic Energy Authority issued a construction licence for two new VVER-1200 reactors at Paks II to be built by Rosatom. In its judgment of 11 September 2025 in Case C-59/23 P, the Court of Justice of the European Union annulled the European Commission's 2017 approval of state aid for Paks II, finding that the Commission's assessment of EU procurement rules was insufficient.²⁷ Despite these bilateral arrangements, Hungary's energy transition is also embedded in EU frameworks. The Commission's December 2023 assessment of Hungary's draft updated National Energy and Climate Plan emphasises that the planned renewable deployment and grid

26 Szymon Kardaś and Andrzej Sadecki, *New Hungarian-Russian Gas Agreement* (Warsaw: Center for Eastern Studies, 2021).

27 Court of Justice of the European Union, "The Court of Justice Annuls the Commission's Decision to Approve Aid from Hungary for the Paks II Nuclear Power Station", *Press Release* 116/25 (2025), accessed 29 March 2026, <https://curia.europa.eu/jcms/upload/docs/application/pdf/2025-09/cp250116en.pdf>.

modernisation will require substantial investment, with EU instruments, such as Cohesion Policy Funds and Recovery and Resilience Plan funding, expected to play an important enabling role.²⁸

Taken together, these developments reveal a dual strategy. On the one hand, Hungary stresses sovereignty through long-term Russian gas contracts and nuclear cooperation. On the other, its ability to modernise the energy system and mobilise financial resources relies on EU law, market integration, and funding mechanisms. Hungarian sovereignty is therefore exercised within a constrained space shaped as much by decision-makers in Brussels as by those in Budapest.

Future scenarios

The future of energy sovereignty in the EU cannot be reduced to a binary choice between national autonomy and supranational solidarity. Instead, it unfolds as a spectrum of institutional arrangements, each reflecting different balances of law, politics, and markets. Accordingly, four plausible scenarios can be identified. These should be understood as analytical ideal types rather than forecasts. Their purpose is not to predict the future evolution of EU energy governance, but to identify and compare alternative institutional logics that may shape the relationship between national sovereignty and European integration.

The Energy NATO

The phrase *Energy NATO* does not form part of EU legal vocabulary, but functions as a political metaphor that has periodically appeared in think tank and policy debates, especially during the 2022 gas crisis. It evokes the idea that just as NATO's article 5 ensures collective defence in the event of an armed attack on one of the Alliance's members the EU could establish a mechanism for collective energy security under which a serious disruption in one member state would trigger assistance from the others. Although currently there is no such treaty clause, several EU legal acts provide partial building blocks. They include:

28 European Commission, *Assessment of the Draft Updated National Energy and Climate Plan of Hungary* (Brussels: 2023).

1. The Energy Union, launched by the European Commission in 2015, represented the first comprehensive attempt to frame energy security as a common European responsibility rather than a purely national competence. Built around the principles of solidarity, diversification, market integration and resilience, it provided the strategic and regulatory foundation for subsequent instruments such as the Security of Supply Regulation and the AggregateEU joint purchasing mechanism;

2. EU Regulation 2017/1938 concerning measures to safeguard the security of gas supply (the Security of Supply – SoS Regulation) introduced one of the strongest solidarity mechanisms in EU energy law. Under the EU's solidarity principle, member states are required, in specified emergency circumstances, to provide gas to neighbouring member states to safeguard supplies to protected customers, even where doing so necessitates restrictions on domestic consumption;

3. EU Council Regulation 2022/2576 established the AggregateEU platform that obliges member states with underground gas storage to aggregate at least 15% of their annual filling needs through joint demand aggregation, explicitly excluding Russian gas from participation;²⁹

4. EU Regulation 2019/941 on risk preparedness in the electricity sector requires member states to share information on system stress, develop cross-border risk scenarios, and provide assistance in the event of supply emergencies. While this is not a binding mutual defence clause, it represents a legal precedent for coordinated crisis management;

5. Council Directive 2009/119/EC requires member states to maintain minimum stocks of crude oil, equivalent to 90 days of net imports, which is an early example of compulsory solidarity in relation to strategic energy resources.

These measures are fragmented. They rely on voluntary participation and national implementation rather than centralised enforcement. To move from partial instruments to a full-fledged collective defence system, three structural reforms are necessary. The first one would entail the development of a strategic energy reserve for Europe. Unlike the current fragmented oil and gas stockpiles, a centralised reserve could be managed at the EU

29 European Commission, *EU Energy Platform: Commission Launches First Call for Companies to Jointly Buy Gas*, 25 April 2023, accessed 29 March 2026, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_2403.

level, possibly by the European Commission or a strengthened European Energy Agency evolving from ACER. This reserve would include gas, oil, and, in the long term, hydrogen or even contracted electricity capacity. Access to the reserve would be automatic in crises, with costs shared proportionally among member states. Additionally, a binding solidarity clause in primary EU law would be necessary. This would require either a new protocol or an amendment to the TFEU introducing a provision modelled on article 5 of the North Atlantic Treaty or article 42(7) TEU – the EU's mutual defence clause in security policy.

Such a clause would create a legal obligation for the member states to assist each other in an event of an energy supply crisis. Lastly, this solution would require an expansion of institutional authority. At present, ACER issues binding decisions only in limited cases such as, for example, the cross-border capacity allocation. For an Energy NATO to function, the mandate of the ACER would have to be expanded to coordinate emergency responses and enforce compliance. ENTSO-E and ENTSO-G could also need to be more closely integrated into decision-making, providing technical capacity for coordinated grid and gas network management.

The idea of an Energy NATO should be understood in the broader context of the securitisation of energy policy in Europe. For many years, EU energy governance was primarily shaped by market integration and economic interdependence. The assumption that trade relations could foster stability and reduce geopolitical tensions – exemplified by Germany's *Wandel durch Handel* policy – had limited the efforts to treat energy security as a matter of collective defence.

This approach gradually changed after successive gas supply disruptions, Russia's annexation of Crimea in 2014, and, most decisively, after the full-scale invasion of Ukraine in 2022. All these events exposed the strategic vulnerabilities created by external energy dependencies and highlighted the limitations of purely market-based approaches to energy security. The failure of the Nord Stream 2 project as a geopolitical stabilisation instrument further accelerated this shift, reinforcing the perception that energy infrastructure had become a strategic and geopolitical tool rather than a purely economic project.³⁰

30 Marcin Terlikowski and Szymon Zaręba, *Nord Stream 2: Inconvenient Questions* (Warsaw: Polish Institute of International Affairs, 2018).

At the same time, NATO broadened its understanding of security to include resilience, protection of critical infrastructure, cybersecurity, and, increasingly, climate-related risks.³¹ Consequently, the analogy between energy security and collective defence became more politically and institutionally plausible than in previous decades. What was once perceived as a peripheral proposal advanced mainly by Central and Eastern European states increasingly entered mainstream European debates on strategic autonomy, resilience, and economic security.

Against this background, the concept of an Energy NATO is no longer merely a political metaphor. Rather, it reflects an emerging debate on whether existing solidarity mechanisms should evolve into a more formalised framework of mutual assistance capable of addressing systemic energy disruptions across the EU.

Embedded autonomy

If the Energy NATO scenario imagines a leap towards collective defence, the more realistic pathway for the coming decade is one of embedded autonomy. In this regards, member states continue to enjoy the formal right to determine their energy mix under article 194(2) TFEU. However, in practice, their decisions are nested within EU regulatory and market frameworks. While the national sovereignty persists, it is reshaped. It no longer means acting alone, but rather negotiating and adapting within supranational constraints.

At the legal level, sovereignty is increasingly filtered through EU climate and market legislation. Several instruments illustrate this trend. Consider the EU's Emissions Trading System (ETS) extended under the Fit for 55 package to road transport and buildings (ETS2) which imposes uniform carbon pricing across sectors previously regulated nationally.³²

This constrains governments' discretion to shield particular industries or consumers from climate costs. Another example is CBAM, which requires member states to align their external trade with EU climate objectives by imposing carbon tariffs on imports. A country cannot opt

31 Wojciech Lorenz, *NATO wobec zmian klimatu – oczekiwania i możliwości* (Warsaw: Polish Institute of International Affairs, 2020).

32 Pierre Bocquillon and Tomas Maltby, "EU Energy Policy Integration as Embedded Intergovernmentalism: The Case of Energy Union Governance," *Journal of European Integration* 42, vol. 1 (2020): 39–57.

for a looser trade arrangement with non-EU partners without undermining the single market. The latter example is the 70% interconnection rule in the EU Regulation 2019/943, which requires transmission system operators to allocate at least 70% of cross-border capacity to the market. National regulators cannot withhold capacity in order to protect domestic industries without risking infringement procedures. These legal instruments preserve the formal sovereignty of states, but in practice, they condition what choices are feasible. A government can still opt for coal, nuclear, or renewables, but the economic and legal viability of that choice depends on whether it aligns with EU emissions caps, carbon prices, and market rules.

Institutional actors play an equally important role in embedding autonomy. The first important institution is ACER, which monitors wholesale energy markets under the EU Regulation 1227/2011 (REMIT) and publishes annual Market Monitoring Reports.³³ Its decisions on capacity allocation or cross-border congestion management are binding, thereby reducing national regulators' ability to deviate from common rules.³⁴

The second institution is the European Network of Transmission System Operators for Electricity (ENTSO-E), which publishes the Ten-Year Network Development Plan (TYNDP). This document identifies priority grid projects that can qualify as Projects of Common Interest (PCI) under EU Regulation 347/2013.³⁵ In practice, national grid operators design their investment strategies in line with ENTSO-E's modelling, because EU funding from the Connecting Europe Facility (CEF) depends on this alignment.³⁶

33 European Union, "Regulation (EU) No. 1227/2011:" 1–16.

34 European Union, "Commission Regulation (EU) 2015/1222 of July 24, 2015, Establishing a Guideline on Capacity Allocation and Congestion Management," *Official Journal of the European Union* L 197 (2015): 24–72; European Union, "Regulation (EU) 2019/942 of the European Parliament and of the Council of June 5, 2019, Establishing a European Union Agency for the Cooperation of Energy Regulators (Recast)," *Official Journal of the European Union* L 158 (2019): 22–53.

35 European Union, "Regulation (EU) No. 347/2013 of the European Parliament and of the Council of April 17, 2013, on Guidelines for Trans-European Energy Infrastructure, Repealing Decision No. 1364/2006/EC, and Amending Regulations (EC) No. 713/2009, (EC) No. 714/2009, and (EC) No. 715/2009," *Official Journal of the European Union* L 115 (2013): 39–75, accessed 31 May 2026, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0347>.

36 European Commission, "PCI and PMI Selection Process," 2024, accessed 29 March 2026, https://energy.ec.europa.eu/topics/infrastructure/projects-common-interest-and-projects-mutual-interest/pci-and-pmi-selection-process_en; European Climate,

The last of the important institutions is the European Commission. It uses conditionality mechanisms, particularly the Recovery and Resilience Facility (RRF) and the Modernisation Fund, to link disbursement of funds with reforms and investments aligned with EU-level decarbonisation goals. It also oversees National Energy and Climate Plans. Poland's access to RRF funding, for instance, has been tied not only to economic reforms but also to milestones in renewable expansion and grid modernisation.³⁷ Through these channels, sovereignty becomes less a matter of unilateral policymaking and more one of bargaining, shaping regulations before they are finalised, and building coalitions within EU decision-making processes. France's success in securing nuclear inclusion in the EU taxonomy is a textbook example. It preserved its nuclear sovereignty not by rejecting integration, but by lobbying to reshape the supranational framework.

The embedded autonomy model points to a paradox that closely reflects Robert Putnam's two-level games theory. On the surface, national governments proclaim control over their energy policies, invoking article 194(2) TFEU, stressing their right to choose their own mix. Yet beneath this rhetoric, the actual policy space is constrained by the interplay of markets, funding conditionality, and cross-border obligations. Such discourse has tangible political consequences. Citizens are told that sovereignty is intact, while domestic policies, such as carbon pricing on transport fuels or restrictions on coal subsidies, are in practice dictated by decision-makers in Brussels. Empirical research suggests that when energy policies show a gap between public discourse and tangible burden-sharing, public trust erodes. For example, in Central and East European states, citizens are seen to be less prone to embrace renewable energy adoption as connected to EU energy policy.³⁸

Several country cases illustrate how embedded autonomy works. Take Germany. Although it formally chose to phase out nuclear power in 2023,

Infrastructure and Environment Executive Agency, *Connecting Europe Facility (CEF): Call for Proposals – CEF 2 Energy: Projects of Common Interest and Projects of Mutual Interest* (2025), accessed 31 May 2026, https://www.euro-access.eu/_media/file/851_call-fiche_cef-e-2025-pci-pmi_en.pdf.

- 37 European Commission, "Poland's Recovery and Resilience Plan," accessed 29 March 2026, https://reforms-investments.ec.europa.eu/recovery-and-resilience-facility-1/country-pages/polands-recovery-and-resilience-plan_en.
- 38 Demetrio Panarello and Andrea Gatto, "Decarbonising Europe – EU Citizens' Perception of Renewable Energy Transition amidst the European Green Deal," *Energy Policy* 172 (2023).

its ability to manage the costs of the *Energiewende* heavily depends on integration into the common electricity and gas markets. The phase-out decision is sovereign, but its consequences are cushioned by EU solidarity mechanisms. In France, nuclear sovereignty is preserved, but the financing of new reactors increasingly relies on taxonomy-based investment criteria and access to EU capital markets. Without EU recognition, French nuclear projects would struggle to attract private investors. While Poland insists on its right to pursue coal and nuclear energy, the pace and scale of its renewable expansion are tied to disbursements from the Modernisation Fund, which is financed through ETS revenues. Sovereignty is invoked, but in practice, it is shaped by funding eligibility criteria set by decision-makers in Brussels. Hungary exercises autonomy through bilateral contracts with Russia, yet its renewable and grid modernisation plans are assessed under the European Commission's National Energy and Climate Plans evaluation framework. Even bilateralism operates under an EU shadow.

Renationalisation

While the trajectory of EU energy governance since the Lisbon Treaty has been one of gradual integration, it is not difficult to imagine a reversal. In a renationalisation scenario, member states seek to reclaim control over their energy systems, undermining supranational frameworks in favour of unilateral strategies. This would not mean a formal withdrawal from the EU's internal energy market, but rather a hollowing of its effectiveness through non-compliance, derogations, and bilateral deals.

One of them is geopolitical bilateralism, which is exemplified by Hungary's long-term gas contract with Gazprom signed in 2021. It reflects a broader and persistent tendency among some member states to pursue bilateral energy arrangements despite increasing EU-level coordination efforts. The deal bypasses Ukraine as a transit route and ties Budapest to Moscow for 15 years, regardless of EU diversification goals. Another symptom is resistance to climate costs. The expansion of the EU ETS to buildings and road transport as part of the Fit for 55 package has provoked strong social concerns.

Some reports find ETS2 "by far the most controversial" file, with frequent references to energy poverty and mobility poverty.³⁹ This resist-

39 Sanna Markkanen et. al., *The Path towards a Socially Just Fit for 55 Package: How Have Social Elements of the Fit for 55 Package Evolved in the Context of the Climate*,

ance may drive governments to seek exemptions or delay implementation. Another trigger for the renationalisation direction is domestic capacity mechanisms. Some governments, including those of Poland and Greece, have consistently lobbied for capacity remuneration mechanisms to support coal or gas plants. Although the European Commission has approved such schemes under strict state aid rules, their proliferation undermines the idea of a level playing field in the internal market. During the 2022 gas crisis, Germany was reported to oppose certain elements of the proposed EU joint-gas-purchasing mechanism, and simultaneously pursued large LNG supply contracts, for example with Qatar.⁴⁰ Although it later participated in AggregateEU, the instinct to act nationally in emergencies revealed the fragility of solidarity mechanisms.

Renationalisation would manifest itself not in the open rejection of EU law, but in its gradual erosion through practice. One possible outcome would be the weakening of AggregateEU: if member states opt to increasingly bypass the joint purchasing platform, its bargaining power would diminish, bringing Europe back to a fragmented buyers' market.

This would result in the breakdown of the 70% rule as transmission system operators under pressure from national governments could limit cross-border flows, undermining EU Regulation 2019/943. The cases of France's public financing of EDF and Poland's coal subsidies illustrate this potential drift. Should member states stop treating ACER's reports or ENTSO-E's TYNDP as authoritative, national regulators and operators would pursue divergent strategies, weakening systemic coherence.

Renationalisation carries multiple systemic risks such as price divergence, weaker bargaining power, and a reduction of climate targets. Without strong cross-border coordination, wholesale electricity and gas prices would

Energy, and Cost-of-Living Crises? (Brussels: Foundation for European Progressive Studies, Friedrich-Ebert-Stiftung and University of Cambridge Institute for Sustainability Leadership, 2023).

- 40 Rachel More and Christian Kraemer, "German Minister Satisfied with 15-Year Qatar LNG Deal," *Reuters*, 29 November 2022; Leigh Hancher and Matthew Levitt, "The EU's Long-Awaited Joint Gas Purchasing Regulations: The Rational and Legal Pitfalls," *Baker Botts*, 23 January 2023, accessed 26 March 2026, <https://www.bakerbotts.com/thought-leadership/publications/2023/january/the-eus-long-awaited-joint-gas-purchasing-regulations>.

increasingly differ across member states, undermining the efficiency of the internal market and the sole logic of EU integration.

Green federalism

The most ambitious scenario is one in which the imperatives of climate neutrality drive EU towards a quasi-federal system of energy governance. Should this happen, achieving the European Climate Law's target of net-zero emissions by 2050, established by Regulation (EU) 2021/1119, would become the overriding political objective, reshaping the institutional balance between Brussels and national capitals. Green federalism represents the logical endpoint of the EU's climate project: a highly centralised governance system in which decarbonisation imperatives override national preferences. It is both the most efficient and the most politically disruptive scenario. While unlikely before 2030, it sets the upper bound for integration, against which the other scenarios – Energy NATO, embedded autonomy, and renationalisation – can be measured.

Current projections suggest that many member states are off-track to meet their 2030 National Energy and Climate Plan (NECP) targets. The 2023 European Commission's assessments of updated NECPs highlighted significant implementation gaps across renewable deployment, energy efficiency, and grid modernisation.⁴¹ Should these shortfalls persist, the EU will be forced to choose between weakening its emissions reduction target by at least 55% by 2030 and further centralising competences to enforce compliance. This potential shift towards greater centralisation is also increasingly framed not only in environmental terms, but also as an industrial and competitiveness strategy aimed at preserving the EU's position in global clean-tech markets *vis-à-vis* the United States and China.⁴²

Federalisation thus emerges not as a voluntary choice, but as a functional necessity. Only by pooling sovereignty at the EU level can the bloc ensure coherent delivery of its climate commitments under the Paris Agreement to limit global temperature increases.

41 European Commission, *EU-Wide Assessment of the Draft Updated National Energy and Climate Plans: An Important Step towards the More Ambitious 2030 Energy and Climate Objectives under the European Green Deal and REPowerEU* (Brussels: 2023).

42 Jonas Meckling et al., "Winning Coalitions for Climate Policy," *Science* 349 (2015): 1170–1171.

To operationalise green federalism, several structural reforms would be needed. The first is a unified CO₂ pricing regime. The current system, comprising ETS1 for power and industry and ETS2 for buildings and transport, still allows member states to influence implementation through compensation mechanisms and national policies. Under federalisation, the EU would move towards a single EU-wide carbon tax or uniform ETS, with revenues channeled directly to the EU budget rather than national treasuries. This would require amending the ETS Directive (2003/87/EC) and revising the legal basis governing EU taxation. It would also require expanding CBAM, which currently applies to cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen. In a federalist scenario, CBAM could be extended to chemicals, plastics, and even manufactured goods, aligning the EU's entire trade policy with decarbonisation goals. This would effectively eliminate member state discretion in external trade relations involving carbon-intensive goods. This scenario would also require centralisation of funding for the transition.

The ETS-based Modernisation Fund, the Innovation Fund, and the Recovery and Resilience Facility (RRF) could be merged into a fund managed directly by the European Commission or a newly created authority. This would sever the current link between national contributions and disbursements, making allocation purely EU-driven. Lastly, treaty reform of article 194(2) TFEU would be necessary to implement this scenario. Currently, this article guarantees member states the right to determine their own energy mix. A federalist scenario would require amending, or reinterpreting, it to enable EU-level bodies to determine the balance between renewables, nuclear, and fossil fuels in each country's system.

The appeal of green federalism lies in its efficiency, as a centralised system could optimise investments by directing capital where it delivers the highest EU-wide decarbonisation impact.⁴³ It would also reduce duplication in infrastructure, avoiding costly overbuild of LNG terminals or parallel hydrogen pipelines, and ensure compliance with climate neutrality by imposing binding pathways on member states, removing the risk of fragmented implementation.

43 Tom Brown et al., "Synergies of Sector Coupling and Transmission Reinforcement in a Cost-Optimised, Highly Renewable European Energy System," *Energy* 160 (2018): 720-739.

Yet the political obstacles are formidable. For France, this could mean that nuclear energy would be subject to EU-level cost-benefit assessment, rather than a matter of a national strategic choice. In Poland, the society may perceive federalisation as technocratic overreach if decisions about energy mixes and carbon taxes are taken in Brussels without strong European parliamentary oversight. Additionally, wealthier western member states could dominate the fund, while poorer eastern states might feel reduced to the role of recipients of centrally allocated funds, further intensifying their political resentment.

Comparative reflections

The four scenarios outlined above, which include Energy NATO, Embedded Autonomy, Renationalisation, and Green Federalism, represent distinct institutional logics. Yet they are not mutually exclusive. In practice, the future of European energy sovereignty will likely incorporate elements from each scenario, with their relative significance shifting in response to crises and evolving political will.

Across all scenarios, one theme is visible: national energy sovereignty is no longer absolute. Even in the renationalisation scenario, governments operate in the shadow of EU law, global markets, and interdependence through infrastructure. Article 194(2) TFEU may enshrine the right to determine energy mixes, but practical sovereignty is continuously constrained by emissions targets and funding conditionality. Another commonality is the role of crisis as a catalyst. The 2022 gas shock demonstrated how sudden external disruptions can push member states towards either solidarity as reflected in the joint gas purchasing under Regulation (EU) 2022/2576 or unilateralism, exemplified by Germany's initial LNG scramble or Hungary's Gazprom contract. Future shocks, climate-related, geopolitical, or economic, will similarly act as stress tests that reveal the balance between national sovereignty and European integration.

The scenarios differ in how they define the location of authority and the binding nature of solidarity, which is presented in chart.

Among these scenarios, Embedded Autonomy appears as the most consistent with current regulatory and political trends characterised by the incremental strengthening of EU regulatory and financial instruments. Elements of the Energy NATO scenario may also expand, particularly if security shocks persist, leading not only to deeper centralisation in the EU, but closer cooperation with NATO, treating energy security as

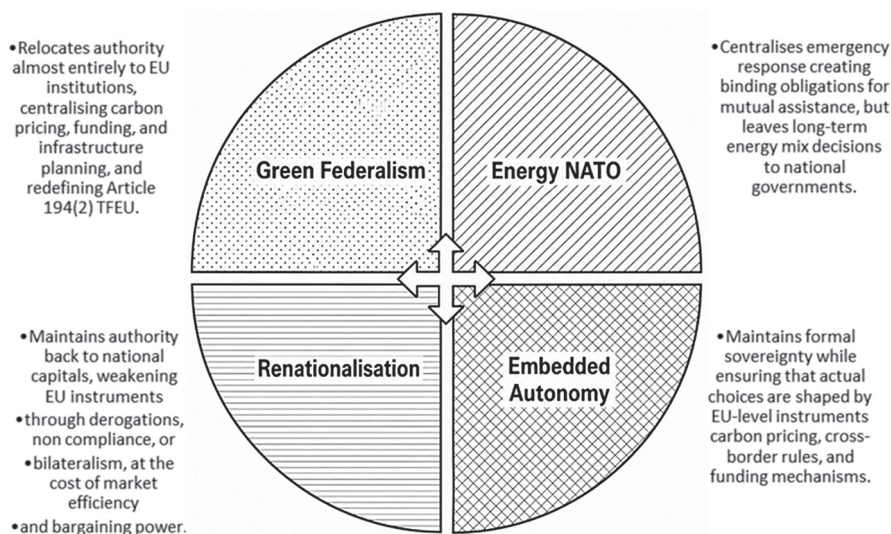


Figure 5. Summary of Energy NATO, Embedded Autonomy, Renationalisation, and Green Federalism scenarios

Source: own work

a resilience building. Renationalisation may occur episodically in response to social backlash against ETS2 or the actions of populist governments pursuing bilateral agreements. It is yet unlikely to become dominant due to the extensive body of EU law and the financial incentives for compliance. Green Federalism is unlikely to emerge before 2030, as it would require EU treaty reform. Its rationale may, however, gain traction thereafter should implementation gaps threaten the 2050 climate neutrality targets.

The comparative analysis indicates that the EU is moving towards a hybrid model, with embedded autonomy as the baseline, incremental shifts towards solidarity mechanisms, and occasional renationalising tendencies. Green federalism remains the upper limit of integration, likely to materialise only if the EU integration develops into political union. The central paradox is that defending national sovereignty increasingly necessitates participation in supranational frameworks. Germany's *Energiewende* depends on the integrated electricity market, France's nuclear strategy relies on EU financial recognition, Poland's coal-to-nuclear transition is contingent on EU funding, and Hungary's bilateralism is constrained by EU climate law. In each instance, sovereignty is defined not by the absence of constraints, but by the capacity to shape and adapt to them.

Conclusions and recommendations

The analysis allows the research questions posed in the introduction to be answered directly. First, EU energy sovereignty cannot be understood as exclusive national control, as member states exercise their competences within an increasingly dense framework of supranational regulation, funding conditionality, and market integration. Second, the future evolution of EU energy governance is likely to follow a hybrid path combining elements of embedded autonomy and selective solidarity, while both full renationalisation and green federalism remain the limiting scenarios. Third, the balance between sovereignty and integration is increasingly shaped by external crises, which act as catalysts for institutional adaptation. The debate on energy sovereignty in the EU is a practical issue of institutional design, financial stability, and geopolitical security, which will determine the Union's ability to reconcile climate ambition with social legitimacy. The scenarios discussed demonstrate that sovereignty and solidarity are interdependent dimensions of European energy governance. The primary challenge is to achieve an effective balance between them.

General conclusions for the EU are the following:

1. National energy sovereignty is formally enshrined as article 194(2) TFEU, which guarantees member states the right to determine their energy mix. Yet, in practice every national strategy is constrained by EU legislation, including ETS2 and CBAM, funding mechanisms such as RRF and Modernisation Fund, and infrastructure planning through ENTSOE's TYNDP. National discretion exists, but only within boundaries established in Brussels;
2. Solidarity mechanisms are likely to expand, with instruments such as AggregateEU under Regulation (EU) 2022/2576 and the Electricity Risk-Preparedness Regulation (EU) 2019/941 providing early indications of deeper mutualisation. Future crises, whether geopolitical or climatic, will accelerate this trend, pushing the Union closer to an Energy NATO-like framework;
3. Renationalisation is a recurring temptation and we have already seen its examples in practice. Hungary's Gazprom contract, Germany's initial LNG scramble in 2022, or Poland's resistance to ETS expansion all show that national reflexes persist. However, in the long run, unilateralism undermines bargaining power and increases exposure to volatility.

Yet, such mechanisms would not eliminate geopolitical bilateralism, which is likely to remain as a structural feature of member states' energy relations, albeit in a more constrained form.

The future of energy sovereignty in the EU is best understood as a moving frontier. Each crisis, each legislative package, each negotiation shifts the balance between national discretion and supranational authority. The states that succeed will be those that can transform embedded autonomy from a constraint into an instrument of influence.

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