

Electricity as Infrastructural Power: Mapping the Physical and Social Dimensions of Norway–EU Interdependence

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Abstract

Electricity price spikes are severely affecting the Norway–EU electricity interdependence. Against the background of geopolitical tensions, the European energy crisis and surging integration with the EU electricity market, Norway’s core energy policy has been challenged. Specifically, the unique relationship between the state, natural resources, territory, and the use of the country’s vast hydropower capacity has been jeopardised by tensions inherent within this electricity interdependence. Drawing on the concepts of infrastructural power and the primary institutions of the English School of IR, the article elaborates the “infrastructural power’s governed interdependence framework” to investigate electricity interdependencies as a crucial nexus between cross-border electricity infrastructure and international relations. Bridging energy studies and IR, the framework captures the bureaucratic state responsiveness feedback effect on electricity interdependencies. This is an essential feature of the energy transition, explaining how governments reclaim control over physical and social infrastructure through increased control over cross-border electricity infrastructure. The research highlights how tensions between the primary institutions of environmental stewardship, the market, nationalism, sovereignty, and territoriality have profoundly shaken the Norwegian political landscape. While the EU has opted for market integration and additional investments in interconnectivity to deliver affordable electricity and secure power supplies, Norwegian civil society has forced domestic policymakers to manage electricity infrastructure directly. Therefore, Norway has introduced measures to restrain price fluctuations, constraining market dynamics, while limiting physical interconnections with the European markets. This could potentially destabilise the entire Norway–EU electricity interdependence.

Keywords

electricity; energy crisis; EU; infrastructural power; interconnectors; interdependence; international relations; market; Norway; power cables

1. Introduction

While the COP30 Belém Declaration emphasises using “social protection to support just transitions and address adverse social and economic impacts resulting from transition policies” (Belém declaration on hunger, poverty, and human-centered climate action, 2025), unprecedented challenges lie ahead. The phasing out of fossil fuels and the parallel build-out of low-carbon energy systems mean this transition is the first in which, to face the threat of “catastrophic climate change,” humanity must “remove the incumbent system and replace it with a new one.” (Bradshaw, 2026, p. 13.) Concerns regarding the coexisting transformation of energy systems and the impact on international relations warrant further scrutiny. The associated risk exposure, particularly at the international level, could have dangerous and unprecedented consequences. Electricity infrastructure is represented as a concrete medium through which the shifting geography of low-carbon energy geopolitics takes spatial form. At the international level, the literature frames actors as being capable of using cross-border electricity infrastructures (CBEIs) to exert “infrastructural violence” in material and imaginary ways, reproducing colonial legacies and facilitating asymmetric interdependencies (Allan et al., 2022; Kroot, 2024; Thaler & Hoffman, 2022).

Today, a vast literature exists focused on the internal/external dichotomy of abundant energy assets, particularly oil, natural gas, and electricity (Boasson, 2020; Claes, 2025a; Førsund, 2015; Hansen & Moe, 2022), fuelling the debate over Norway as Europe’s “green battery” (Gullberg, 2013) and Norway’s energy geopolitics in times of crisis (Austvik, 2025). However, Norway–EU electricity interdependence has only recently come to the fore in the social sciences (Silvester, 2025), while remaining underinvestigated in relation to the CBEIs and international relations (IR) nexus.

The article employs a mixed methodology to develop, initiate, and extend (Tzagkarakis & Kritas, 2023) interdisciplinary approaches in energy studies and international relations. Drawing on concepts from the English school of international relations (ES of IR), such as international society and primary institutions (Aalto & Korkmaz-Temel, 2014; Buzan & Falkner, 2024), as well as infrastructural power and governed interdependence theory (Heibach & Taş, 2024; Mann, 1984, 2019; Weiss, 2006), the first part of this article builds an innovative and nuanced theoretical approach and conceptual framework. This study seeks to respond to the following research question: How do Norway’s primary institutions and infrastructural power influence the politics of EU–Norway cross-border electricity trade?

The theoretical framework is intended as “a construct in which each concept presented plays an integral role,” and it is employed as “an interpretative approach to social reality” to aid understanding of the selected case study (Jabareen, 2009, p. 51). This method is aimed at guiding the application of theory on a micro-level, providing a “point of reference from which the researcher can make sense of the dynamic nature of the research process” (Van der Walddt, 2020, p. 4) related to energy and international relations and the investigation of the CBEIs–IR nexus. The Norway–EU electricity interdependence in the wake of the 2022 energy crisis is chosen as a hypothesis-generating case study. The aim is to sharpen the theoretical framework by focusing on the “ongoing dialogue between theory and evidence” (Levy, 2008, p. 5), followed by subsequent tests of the same framework in other cases. This research captures Oslo’s latest major initiatives on the domestic power market and power interconnectors as turning points in Norway–EU electricity interdependence (Government of Norway, 2025a). This article approaches the CBEIs–IR nexus and electricity interdependencies as a “two-way street.” This means the Norwegian state, state entities, and civil society,

including industries and energy businesses, but also parties and voters, interact with each other through the key bureaucratic state responsiveness (BSR) feedback effects on the broader electricity interdependence.

The article is organised as follows: Section 2 discusses the existing literature on the CBEIs–IR nexus; Section 3 introduces the role of primary institutions in IR and debates approaches to studying energy crises and international tensions. An IR-informed analysis of the transformation of energy systems is proposed for the investigation of the Norway–EU electricity interdependence and political relationship, informing the Norwegian institutional landscape regarding electricity. Section 4 critically reviews the concepts of infrastructural power, governed interdependence, and BSR, considering electricity as a key element of the state's physical and social infrastructures. Coupled with primary institutions in the ES of IR, the section builds the theoretical framework guiding the rest of the analysis. Section 5 presents Norway's peculiar set of primary institutions and infrastructural power related to electricity. Section 6 empirically investigates how primary institutions interacted in the wake of the 2022 energy crisis, affecting the CBEIs–IR nexus in the governed Norway–EU electricity interdependence. This section also conceptualises Norway's intervention in governing CBEIs to defend domestic energy interests and explains the BSR feedback effects through which, after 2022, geopolitical tensions and the energy crisis threaten to transform the Norway–EU one into an ungoverned interdependence. Finally, Section 7 highlights the major theoretical and empirical observations.

The following analysis and data are sourced from primary and secondary open sources, including governmental and ministerial reports, statements from public institutions and state-owned entities, the EU Commission, and respective market and regulatory authorities. Open-source data and information regarding the Norway–EU interdependence are gathered from industrial entities, such as Energifakta Norge, Norway's Transmission System Operator (TSO) Statnett, Statistics Norway (Statistisk Sentralbyrå), Energy Charts, and the database from the Fraunhofer Institute for Solar Energy Systems (ISE), the archives of political parties and non-party entities, such as FriFagbevelse. In addition, data is sourced from globally respected research institutes, consultancies, and independent commodity services.

2. Re-Thinking Energy Infrastructures and Transnational Electricity Systems

Multidisciplinary studies have critically approached how the realisation and expansion of energy infrastructures generate frictions and social conflicts, revealing socially and politically constitutive power amidst the contemporary “infrastructural moment” (Bridge et al., 2018; McCauley et al., 2016; Hoffman, 2018). Large-scale, high-profile megaprojects are justified by “grand narratives” implying universal benefits and urgent necessities. The proponents of these projects promise material investments and the broader improvement of social conditions through “fate of the nation” discourses, advancing the material interests of specific actors and groups, often divorcing energy policymaking from public participation (Bridge et al., 2018). To some scholars, energy becomes a unique “companion and collaborator of modern power” and modern states, that “have always sought to control and capitalize on the transformational power of energy” (Boyer, 2011, p. 5). New attention to the social aspects of energy infrastructure is gaining traction. These are increasingly “not understood as economic necessities but as avoidable political choices” (Hoffman, 2018, pp. 39–40) by states inhabiting peculiar global political economies, such as the Middle East or the Arctic (McCauley et al., 2016).

Only recently have insights from political science, IR, and energy and human geography increasingly oriented CBEIs-focused studies. This literature argues that national and subnational transition processes and scales are linked to transboundary challenges in CBEIs' operation and governance (Allan et al., 2022; Kroot, 2024; Thaler & Hoffman, 2022). Electricity infrastructures do political work for the state, exceeding the technical capacity of moving energy, and accentuating asymmetric interdependencies. Although they differ from other types of circulation across energy types, CBEIs are evoked as instruments of territorialisation: "a mechanism for laying claim to space, resources, and influence both within and beyond borders" (Kroot, 2024, p. 318). These studies assume a nationalist character of CBEIs amidst a myriad of concerns beyond the energy sphere, all themes closely linked to international politics. Problematising CBEIs and IR, studies emphasise that countries face an "impossible energy trinity" where energy security, sustainable energy, and energy sovereignty cannot be maximised simultaneously (Thaler & Hoffman, 2022). A country should thus choose between opposed CBEI options: sacrificing sustainability, compromising energy security, or relinquishing energy sovereignty and relying on energy interdependencies.

3. IR Building Bridges Between Energy Infrastructures and State Power

3.1. *Tensions Among Primary Institutions: The Market, Sovereignty, and Territoriality*

At a time when "fate of the nation" narratives influence public perception and material energy interests, a broader gap within the literature exists regarding the conceptualisation of the "fate of the international" and the role of CBEIs in replacing incumbent energy systems. In the current era of international tensions, the relationship between these processes and the concepts of power and the state remains under-investigated. The same goes for the controversial role of countries, states, and business entities in shaping a new energy order and an era of interdependencies. The time is ripe for interdisciplinary approaches able to merge energy studies with the fields of IR and IPE. A rising tide of interest in energy, markets, and infrastructure has followed global phenomena such as the Russian invasion of Ukraine, trade wars, and the growing politicisation of energy trade from the United States to the Middle East (Claes, 2025b; Sassi, 2023, 2025).

This article conceptualises how different institutions of international society affect the dynamic relationship between CBEIs and IR by populating electricity interdependencies. Drawing on the ES of IR, the article focuses on the primary institutions of international society as those reaching across the three domains organising it: interstate, transnational, and interhuman (Aalto & Korkmaz-Temel, 2014; Buzan & Falkner, 2024). While the interhuman perspective is frequently connected to energy transition studies, the interstate and transnational dimensions have only limitedly informed the debate surrounding CBEIs. The primary institutions relevant to this study are:

- *Environmental stewardship*: The belief that international society has a responsibility to manage the planetary ecosphere.
- *Nationalism*: The belief that the nation provides the primary legitimacy for the state.
- *Sovereignty*: The belief that each state has the supreme right to decide its own affairs.
- *Territoriality*: The belief that the political exercise of sovereignty should be organized within bounded territorial spaces.

- *Market*: The belief that the market, understood “not just as an economic theory, but also as a political ideology,” promotes the “claimed efficiency of the market for both economic and political ends” (Buzan & Falkner, 2024, pp. 1–2), becoming a foundational concept of modern societies.

In an era of turbulence and instability, the relationship between primary institutions appears at odds, as the idea of the *market* as a quasi-natural, self-governing mechanism “serves to insulate politicians, bankers, and businesses from responsibility for making decisions that affect the distribution of income and wealth in society” (Buzan & Falkner, 2024, p. 30). This has obvious implications for the CBEIs–IR nexus. However, the modalities through which tensions between the *market* and other primary institutions affect IR remain under-investigated.

3.2. A Smooth EU–Norway Electricity Interdependence and Green Alliance?

Internationally perceived as a hydrocarbon power, electricity plays the most relevant role in framing Norway’s BSR in terms of physical and social infrastructural power. In 2025, almost 88% of the electricity generation came from hydropower, with the rest sourced from a mix of renewables and a fraction of gas-fired power generation (Figure 1).

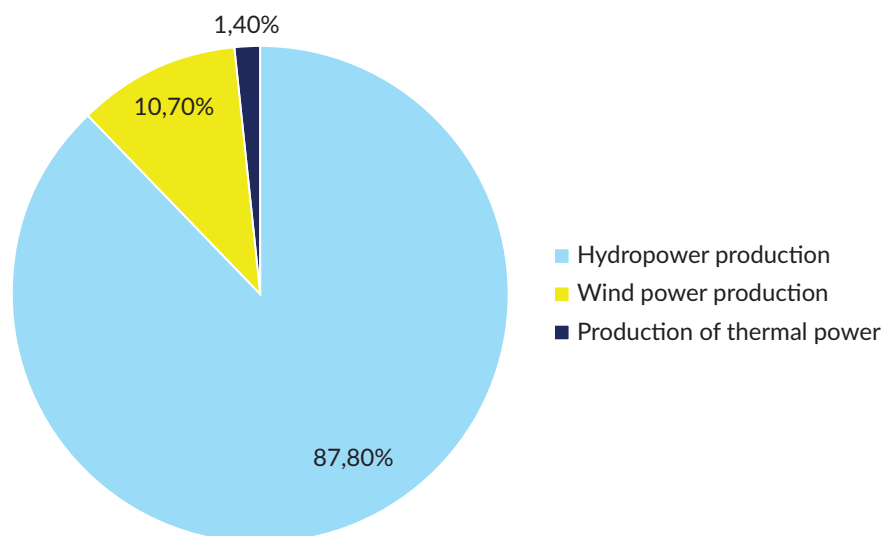


Figure 1. Power generation in Norway per source (Dec-2024–Dec-2025). Source: Author’s own elaboration of data from SSB.

Beyond being one of the few countries in the world with an almost completely renewable-based power sector, Norway has the highest share of electrified energy consumption among IEA members. Municipalities, counties, and state central authorities own about 80% of Norway’s electricity production capacity, 35% of which is owned directly by the state through Statkraft SF (Energifakta Norge, 2026). The company is Europe’s largest hydropower producer and answers to the Ministry of Trade, Industry and Fisheries.

Ample hydrocarbons and hydroelectric reserves make Norway a major net energy exporter. With an export balance of 8,196 petajoules in 2024—equal to 87.6% of the country’s total energy production—Norway is the largest exporter in Western Europe. In 2025, Norwegian power exports, including to the UK, Denmark,

Germany, and the Netherlands, reached 34 TWh (Figure 2). With variations driven by weather and climate conditions, Norway and Switzerland remain by far the two largest contributors to extra-EU electricity imports (European Commission, 2025a). In particular, Norway dominates exports in the crucial winter months, making the country a fundamental electricity partner of the EU.

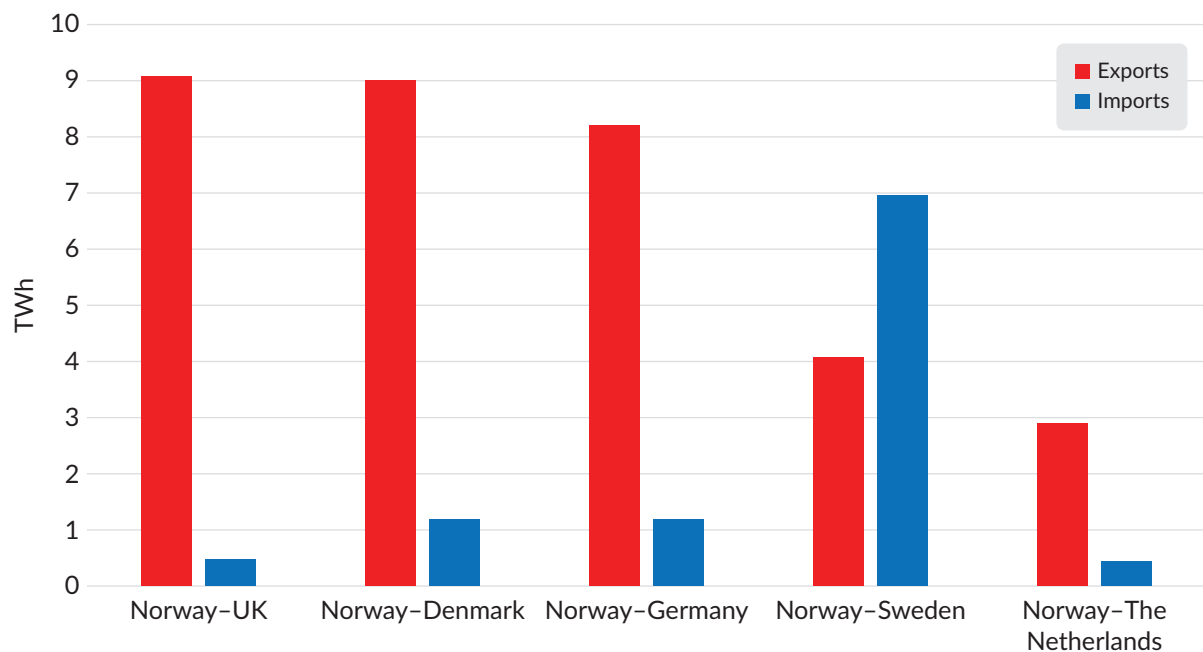


Figure 2. Norway's cross-border electricity flows in 2025. Source: Author's own elaboration of data from Fraunhofer ISE.

In the wake of 2022, the strengthening of Norway-EU electricity interdependence was cemented further, with Prime Minister Jonas Gahr Støre affirming that “Europe needs Norway and Norway needs Europe” (Støre, 2025). Amidst the European energy crisis—worsened by the crumbling of the energy interdependence with Russia (Sassi, 2025)—the significance of the interdependence has been highlighted by the bilateral Green Alliance signed in 2023, privileging cooperation on clean energy and climate action (Government of Norway, 2023). The shared EU-Norway values underpinning the Green Alliance are also reflected in the REPowerEU strategy issued in 2022 as a response to the energy crisis triggered by Russia's invasion of Ukraine to reduce EU dependency on hydrocarbons (European Commission, 2026a).

Norway's role as an electricity supplier has been acknowledged as it did “literally prevent blackouts in the European Union” (von der Leyen, 2023). Framing it as a smooth interdependence facilitated by the market institution, the same President of the EU Commission Ursula von der Leyen, described Norway and the EU as having “shared values” and as being “integrated through our Single Market” (von der Leyen, 2025). As an example of shared values, Norway set ambitious targets to reduce greenhouse gas emissions and established the goal of becoming a low-emissions society by 2050. This has supported Norway's representation as Europe's “green battery,” while also shaping the policy-making agenda (Gullberg, 2013; Hansen & Moe, 2022). Data, literature, political statements, and strategies suggest that the electricity market played a key role in smoothing tensions between primary institutions within the interdependence, framed as a Green Alliance. Whereas tensions appeared in Norway-EU electricity interdependence, they did not surface at the main level of bilateral diplomacy to the point of affecting the CBEIs-IR nexus. Nonetheless, this does

exclude the possibility that the implications of the 2022 energy crisis have eroded the confidence of stakeholders in market instruments at the domestic level. Disruptions and price spikes have, in fact, weakened confidence in energy markets. Testing how the Norwegian government and society have reframed electricity interdependence with the EU while abiding by the Green Alliance narrative appears significantly important to understand the future of bilateral infrastructural interconnectedness and the preservation of national interests at the domestic level.

4. Reframing Institutions and Electricity Interdependencies Through Infrastructural Power

In the work of Michael Mann, the strength of the state embodies a crucial component influencing various outcomes, including economic development and the quality of democracy. Defined as a “differentiated set of institutions and personnel embodying centrality in the sense that political relations radiate outwards from a centre to cover a territorially demarcated area,” the state exercises a “monopoly of authoritative binding rulemaking” (Mann, 1984, p. 188). The power of state elites rests on regulations and coercion centrally administered, territorially bounded, and institutionalised negotiations. Counterbalancing the state’s political power, other power groupings whose base lies in civil society lean on ideological, economic, and military power. Infrastructural power is defined as the essence of the routinised powers of the state. It relates to the state’s capacity to “penetrate civil society and implement its actions across its territories” (Mann, 2008, p. 355). Combined with the state’s political power, infrastructural power works as a “two-way street,” enabling “civil society parties to control the state” (Mann, 1993, p. 59) and represents the minimum condition of “stateness.” In a later assessment, Mann argues that infrastructural power comprises both physical infrastructure and social infrastructure, or the “human relationships through which the regime persuades others to implement and enforce its laws and dictates throughout the realm” (Mann, 2019, p. 173). This article argues that energy, through its pervasive and transformative role as a “companion and collaborator” of modern states, covers both the physical and social range of infrastructural power. In a globalised world of economic interactions and interconnectedness, the state’s infrastructural power is framed as “governed interdependence” as government agencies and economic actors “enter into cooperative arrangements for the pursuit of joint coordinated projects under the goal-setting auspices of the state” (Weiss, 2006, p. 168). The state remains the “ultimate arbiter” of the rules and goals of interactions for pooling resources, sharing tasks, and exchanging information. The governed interdependence framework applies well to the internal/external dichotomy that electricity interdependencies entail for the state. At the same time, governed interdependence becomes a useful conceptual tool for bridging the interconnected nature of economic and energy relations, the complex web of physical and social infrastructural power within the international society, and the fundamental role of primary institutions in the ES of IR. A new research agenda, expanding on the theorisation of power relations and existing forms of “stateness,” social structures, and energy interdependencies, could be opened while investigating Norway’s ability to ensure national energy interests such as low electricity prices and secure power supplies as a particular form of social infrastructure. As a hypothesis-generating case study, the investigation highlights Norway’s physical infrastructural power, aimed at managing CBEIs while widening interdependencies with neighbouring electricity systems and markets amid extensive political and energy uncertainties.

To connect the internal/external projection of the CBEIs–IR nexus, the article merges Weiss’s conceptualisation of governed interdependence with the role of primary institutions in the international

society and the mapping of infrastructural power in foreign policy elaborated by Heibach and Taş. In democracies, or bureaucratic states, “the state is controlled by societal forces and does not set its own goals.” As such, “the government merely seeks to uphold the dominant social groups’ interests in international relations at a given point in time” (Heibach & Taş, 2024, p. 7). The state remains the principal agent of infrastructural power in foreign policy through bargaining as the principal mode of resource mobilisation. The strategic coordination of state and non-state resources is possible through BSR where “non-state actors may resist—even undermine—state attempts to engage them, without facing significant cost” (Heibach & Taş, 2024, p. 9).

With infrastructural power exerted as a “two-way street” between state entities and non-state social forces, the state seeks to control and capitalize on the transformational power of energy infrastructure while preserving energy interests. This process unfolds by balancing tensions between primary institutions; these tensions originate within the electricity interdependence through physical evidence of infrastructural power, such as CBEIs, and social infrastructure in the form of affordable and secure power supplies. The state’s physical infrastructural power through CBEIs goes hand in hand with social effects of the electricity system’s governance on prices and access to services. In this framework, the institutional state is the central actor in both domestic and external energy governance. The interdependent party, together with the institutional state—forming the electricity interdependence taken as the object of the study—is the only actor not directly involved in the systemic implications of the BSR dynamics. Yet, the interdependent party is also affected indirectly as BSR becomes the defining feature bridging the domestic and external projections of physical and social energy infrastructure within the governed interdependence. In fact, BSR informs the modalities through which governments intervene to deliver national energy interests through CBEIs (Figure 3).

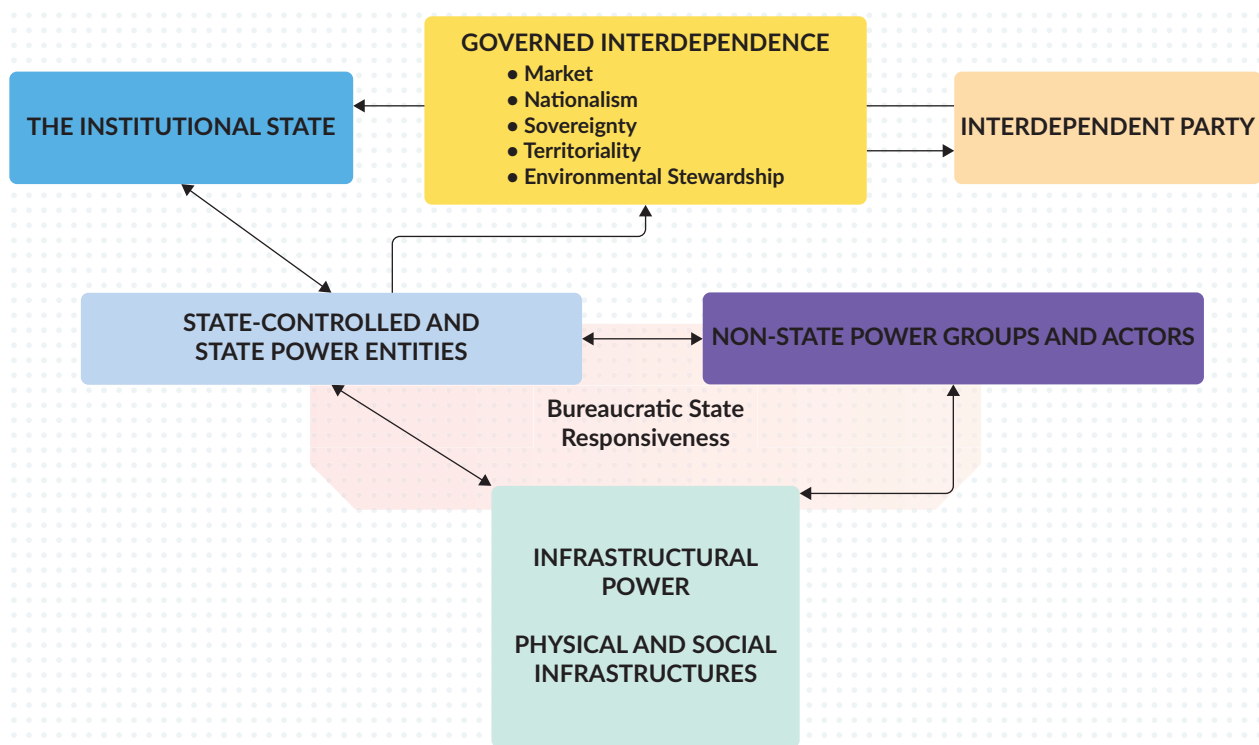


Figure 3. State-society relations in infrastructural power's governed interdependence framework.

As a core concept in the article, BSR infuses the governed electricity interdependence with the reinterpretation of the CBEIs–IR nexus by state and non-state power groups and actors, such as parties, businesses, industries, and households. After reviewing the effects of electricity interdependence on infrastructural power, these groups alert state entities about the relevance of existing tensions among primary institutions. Specifically, the proposed framework explains how tensions between primary institutions in electricity interdependencies empirically inform the state's physical and social infrastructural power (Figure 3). Consequently, this feedback effect on the same state entities tasked with governing electricity interdependence is poised to influence the state's governance and resource mobilisation directly. In this context, affordable and secure electricity supply and CBEIs serve as key representations of the state's physical and social infrastructural power. The BSR concept illustrates, through nuanced and specific forms, how state-controlled and state power entities interpret the various primary institutions populating the governed interdependence between international energy actors. In this way, the proposed framework introduces an interstate, transnational, and interhuman understanding of power of peoples, energy resources, the market, the state, and the territory. The analysis can thus capture both the domestic and external elements of the governed energy interdependence and the BSR dynamics. Furthermore, researchers can use this framework to investigate, in greater depth, either the international or the domestic perspective of that interdependence. On one hand, research could focus on the international dimension of the governed interdependence. In particular, this can be done by researching the evolution of the primary institutions populating the governed electricity interdependence, considering the relationship between the institutional state and the interdependent party. On the other hand, the focus can shift to the domestic perspective. This can be done by examining BSR dynamics, concentrating on the reactions of state-controlled, state power entities, and the non-state power groups to the shifting realities of the state's physical and social infrastructures. Accordingly, the framework provides a new conceptualisation of and approach to investigating electricity interdependencies involving democratic and bureaucratic states.

5. The People, the State, the Territory, and Electricity: The Infrastructural Power of the Norwegian State

The institutional landscape within the Norwegian electricity sector briefly presented in Section 3.2 clearly emphasises the reduced distance from state-controlled and state power entities with the state's infrastructural power. This factor increases the salience of both physical and social infrastructures in the BSR feedback effect.

Empirical evidence that electricity is the crucial token of Norway's physical and social infrastructural power, binding the territory to the state, dates back to Norway's independence. In 1917, the Parliament (Storting) restricted domestic and foreign private ownership of waterfalls for hydropower, requiring investors to yield power to the local municipality; the basic principles of this legislation are still in place today (Claes, 2025a). The pricing of hydropower, largely influential in determining electricity prices, has been “an area of direct political control” (Førsund, 2015, p. 1), making low electricity prices a critical component of the state's social contract. Feeding the national grid, average-cost pricing was set at the municipal and state level. Until the 1980s, large investments in the sector secured affordable power for energy-intensive industries, boosting consumption in the household and service sectors, as well as productivity and economic competitiveness. The state secured control through the Norwegian Water Resources and Energy Directorate, tasked with ensuring sufficient supply and demand, placing the state and local authorities as the guarantors. The same have been embedded in the expectations of non-state power groups and actors.

The primary institutions of nationalism, sovereignty, territoriality, and environmental stewardship played a major role in supporting the no side in the 1972 referendum to join the EEC, grounded in “the need to maintain Norwegian resources for the Norwegians” (Neumann, 2002, p. 114). A fundamental nexus exists between Norway, understood as the people and the territory, and the physical and social infrastructural power the state exerts through control of energy produced through natural resources. In the 1994 referendum, the No side against joining the EU successfully played the dichotomies of equality/inequality, people/bureaucracy, centre/periphery against the dichotomy of Norway/EU (Neumann, 2002, pp. 116–124). This has further informed the state’s infrastructural power frames.

Nevertheless, Norway’s entry into the European Economic Area (EEA) agreement has helped the surge of the market as a primary institution. Market regulations have been turned into national law, organising the country’s energy linkages to the international society. In 1990, the Energy Act laid down the framework for deregulating and liberalising the domestic electricity sector (Bye & Hope, 2005). Anticipating EU intervention, these measures responded to inefficiencies in investment patterns and excess generation capacity. The market’s inflexibility and contractual terms were underpinned by the Statkraft price, determined by the Storting and unlinked from market costs. The reform split Statkraft into two separate legal entities, Statkraft SF, focusing on power generation, and Statnett SF, focused on transmission services; both were tasked with natural monopolies (Bye & Hope, 2005, p. 5271). Transparency and non-discriminatory access principles have been foregrounded, embracing the market institution while reducing and levelling prices among consumer groups.

For decades, the Norway–EU electricity interdependence has been preserved through balanced governance and limited BSR feedback effects on the state’s physical and social infrastructural power. Still, tensions between primary institutions arose on various occasions. When the EU adopted a directive creating a common electricity market in 1996, Norway’s institutions readily accepted the legislation. However, in a 2006 EFTA Court case, Oslo deliberated that only public ownership could obtain concessions for waterfalls intended for power production. This strengthened the state’s control over the hydropower sector, reasserting its infrastructural power by reclaiming sovereignty and territoriality over the most vital power production facilities (Claes, 2025b, p. 672). As a consequence, state entities such as the Ministry of Petroleum and Energy and Statkraft have been reinforced, limiting the market institution’s primacy in the governed interdependence. This reduced the incentive to invest in alternative low-carbon sources, deepening the country’s reliance on hydropower. Moreover, this dynamic has given growing prominence to the country’s ten largest power producers, today supplying 75% of power output (Energifakta Norge, 2026). Insufficient market incentives, such as price flexibility and price signals, slowed the development of Norwegian CBEIs, balancing products, and long-term contracts—evidence of a conceptualisation of energy infrastructure that differed from European models (Gullberg, 2013; Hansen & Moe, 2022). These developments struck a unique balance between primary institutions in Norway, weakening both the market and environmental stewardship while reinforcing the influence of nationalism, sovereignty, and territoriality.

Nevertheless, the market became the predominant primary institution in the electricity interdependence through power trading, with the first interconnectors to Sweden built in 1960 and the first subsea interconnectors to Denmark (Skagerrak 1 and 2) realised in 1976–1977. In 1996 Nord Pool was joined by Sweden, later by Denmark and Finland, and finally by Germany and the UK, becoming the world’s first international power exchange. The market has leaned on a set of existing and new CBEIs projects. However,

market concentration and regionalisation have also increased because of Norway's transmission constraints within the domestic power grid. The country has five price areas defined as bidding zones (BZs), meaning the largest geographical area within which market participants can exchange energy without capacity allocation (Figure 4).

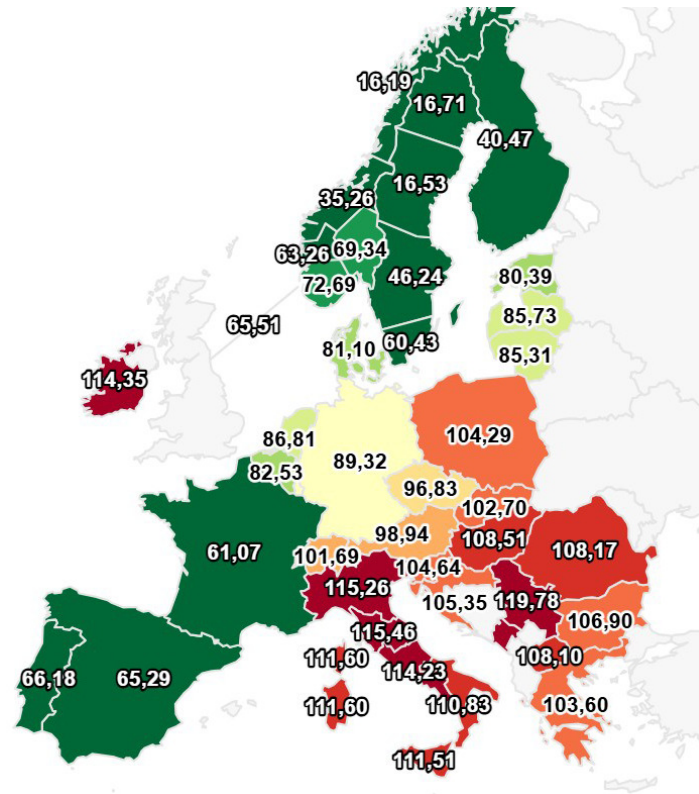


Figure 4. Average spot market prices in 2025 (in €/MWh). Source: Energy Charts/Fraunhofer ISE.

According to Statnett, the organisation into BZs provides market signals to efficiently organise resources, moving electricity from areas with a surplus to others where deficits increase the price (Langum, 2025). However, without enough capacity in the grid to equalise price divergencies, these have consolidated over time. In 2025, spot electricity prices in Norway's BZ 4 were the lowest in all of Europe, and in BZ 3 they were the fourth cheapest (Figure 4). Yet, in BZs more integrated through CBEIs with European markets (specifically BZ 5, BZ 1, and BZ 2), prices have been more than four times higher than in BZ 4, aligning more closely with European averages and increasing costs for Norwegian households and industries.

6. The Energy Crisis and Bureaucratic Responsiveness: Towards an Ungoverned Interdependence?

Today, tensions among the primary institutions of the Norway–EU electricity interdependence are at a crucial turning point. Electricity price spikes in the wake of the European energy crisis have altered Norway's physical and social infrastructural power. This has led Norwegian policymakers to reclaim state-centred energy policymaking and has affected the long-term trajectory of the electricity interdependence and the CBEIs–IR nexus.

6.1. *The Interdependent Party: The Perspective of the EU*

Today, the EU and its neighbours, where the same market rules apply—including Norway—constitute the only large multi-country entity to have built an open internal electricity market at a continental scale. This is a political result of gradual mutualisation and the layering of regulations implemented by European agencies (Glachant, 2021). The EU Agency for the Cooperation of Energy Regulators (ACER) is the agency driving increased energy market integration, tasked with overseeing market competitiveness, efficient use of infrastructures, and the acceleration of decarbonisation in European energy systems. Incentives and prioritisation for projects to “play European”—with billions funnelled through the EU’s Connecting Facility (CEF) financing program—are “heavily influenced by the general rules of the game” set by relevant EU institutions (Glachant, 2021, p. 539). State-controlled Statnett is among the 40 members of the European Network of Transmission System Operators for Electricity (ENTSO-E), aimed at ensuring the secure and coordinated operation of Europe’s electricity system. The EU electricity market design builds on the principle of being “the most cost-effective way to ensure secure, sustainable and affordable energy supplies to EU citizens. Through common energy market rules and cross-border infrastructure, energy can be produced in one EU country and delivered to consumers in another” (European Commission, 2026b). The interaction between the market and these rules, a key determinant in framing the debate between CBEIs and IR, has unleashed new layers of political paradoxes and tensions in the wake of the 2022 crisis.

In the past, Norwegian interest groups and political parties confronted each other on different prospects for exporting the power surplus while managing domestic impacts. Feedback effects of BSR were clearly visible in the governments’ predilection for CBEIs projects deemed profitable for electricity companies and “profitable and cost-efficient in a socio-economic perspective” (Gullberg, 2013, pp. 620–621). In the mid-2010s, an electricity surplus induced by the financial crisis, greater efficiency of water reserves, and fewer CBEIs projects than expected reduced revenues for electricity corporations to a minimum (Boasson, 2020, pp. 200–203). The state’s physical infrastructural power regarding CBEIs, affected by concerns for electricity prices and power supplies, resulted in the postponement of new interconnectors with Germany, the UK, and the Netherlands and reduced integration in the 2010–2020 period. The surge in gas prices due to the Russian invasion of Ukraine sparked a Europe-wide energy crisis with deep implications for electricity prices. Rising inflation and soaring energy bills have led to increased energy poverty and the relocation of many industrial sectors. The EU Commission launched the REPowerEU plan to diversify energy imports away from Russia and invest in energy infrastructure to strengthen energy connectivity across the continent. The plan also aimed to enhance international cooperation with alternative partners such as Norway, Ukraine, Azerbaijan, Namibia, Japan, Argentina, and Uruguay, while accelerating clean energy production (European Commission, 2026a). Nonetheless, the European Commission deemed it necessary to implement a comprehensive market reform. In 2022, at the peak of the crisis, President von der Leyen emphasised: “this market system does not work anymore. We have to reform it. We have to adapt it to the new realities of dominant renewables” (von der Leyen, 2022), identifying an incapacity among policymakers to adapt the market institution to low-carbon sources to ensure environmental stewardship. Four years later, von der Leyen confirmed that “prices are still too high and too volatile,” blaming insufficient investment in alternative sources and the influence of natural gas on electricity prices, and thus the market as a primary institution (von der Leyen, 2026). To solve the problem, the EU Commission aims to facilitate cross-border electricity flows by implementing the so-called European Grids Package. The plan includes the fast-tracking of *Energy Highways*, allowing clean energy to “flow freely all across our Union so that cheap energy can flow

where it is needed, when it is needed” (von der Leyen, 2026). The European Grids Package and Energy Highways initiatives uphold these principles, providing a five-fold increase in the CEF budget to almost €30 billion for the 2028–2034 planning period. The goal is to establish a European infrastructure planning framework, accelerate permitting procedures, and ensure a fairer division of CBEIs’ costs, thereby speeding up the development of grids and other physical energy infrastructure across the EU (European Commission, 2025b). This strategy doubles down on market liberalisation and environmental stewardship institutions, while policymakers assume the responsibility for steering investments into CBEIs to reduce electricity prices and secure supplies. The implicit goal is to erase tensions with nationalism, sovereignty, and territoriality by reducing electricity prices.

The initiatives include an upgrade of electricity interconnectors to replace “barriers and bottlenecks” and “support affordable living for all Europeans” (European Commission, 2025b). Notable projects include the incremental interconnections between Germany and Denmark and between Germany and Central and Eastern EU member states (Figure 5). The Commission anticipates that boosting CBEIs’ trade by 50% will raise the annual EU GDP by €18 billion, avoiding congestion costs of up to €26 billion and preventing 45% of cross-border electricity capacity needs from remaining unaddressed by 2030. This strategy affirms the primacy of the market as a social electricity infrastructure within the EU, delegating to it the responsibility to secure power supplies and affordable electricity prices and protect environmental stewardship, with policymakers responsible for investing heavily in CBEIs as pivotal physical infrastructure.

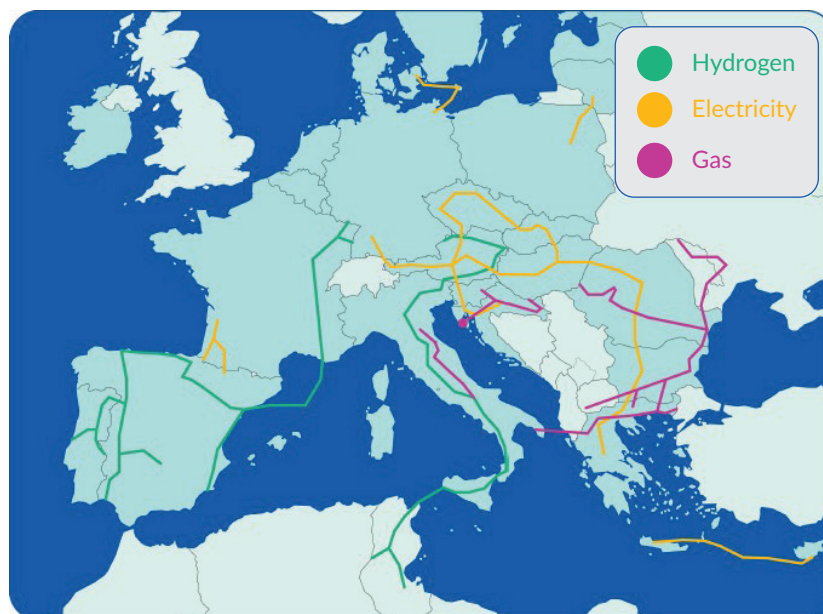


Figure 5. Projects fast-tracked under the energy highways program. Source: European Commission (2025b).

6.2. Testing Norway’s Physical and Social Infrastructural Power

In 2021, a new Norwegian coalition government was formed between the Labour Party and the Centre Party. The latter’s explicit opposition to offshore wind power—and its connection to both the mainland and the European continent—subsequently came to the fore as a major political issue. Tensions between the primary institutions of nationalism, sovereignty, and territoriality on one hand, and environmental

stewardship and the market on the other have been revived. Since 2022, electricity price spikes, traditionally influenced by structural fluctuations in the European market, have intensified. In addition to higher gas prices, increased electricity demand has been driven by temperature anomalies, with rebounding industrial and commercial sectors having a more limited effect. In the same year, the Norwegian government appointed an Energy Commission within the Ministry of Petroleum and Energy to assess the importance of the power balance to achieve competitive prices and security of supply in line with ideas of centrally administering energy within national boundaries. The commission has projected a power demand growth of between 21 and 35 TWh by 2030, and possibly up to 75 TWh, with risks increasing during dry years (NOU, 2023, p. 10). A new record for domestic electricity consumption was also established in early January 2026, with an outstanding 25,309 MWh peak as heating demand surged amid cold weather (Statnett, 2026). According to Det Norske Veritas, an important representative of civil society, the country risks a power deficit by the early 2030s as demand from data centres, energy-intensive industry, oil and gas electrification, and electric vehicles' charging grows much faster than supply (Det Norske Veritas, 2025).

In 2023, an independent Expert Committee with representatives from civil society, including scholars, and from business, industry, trade unions, and the power industry was tasked with assessing the causes and implications of electricity price fluctuations. Its report pointed out “a significant increase in revenue for electricity producers,” adding that this “created a challenging situation for electricity consumers” (Electricity Price Committee, 2023, p. 1). The crisis hit Europe and Norway during a “particularly vulnerable time,” amid the Russia–Ukraine war and the shifting of market conditions, including “the opening of two new interconnectors” with Europe (Electricity Price Committee, 2023, p. 5). This proves a dichotomy exists between the market/environmental stewardship primary institutions within Norway and the CBEIs–IR nexus compared to the EU. Critically, the committee has indicated that limitations to interconnectors could have a price-dampening effect as long as Norway has a power surplus. It has also highlighted that the “desire for lower, competitive and predictable prices may conflict with a goal of socio-economic profitability” of interconnectors. With a significant BSR feedback effect on Norway–EU electricity interdependence, the committee explained that “measures to strengthen the power balance may conflict with respect for nature and cultural practices” (Electricity Price Committee, 2023, p. 14). This suggests opposition by all primary institutions against the market. Finally, another committee of the Ministry of Foreign Affairs (MFA) advocated accelerating the incorporation of EEA legislation in Norway, reducing the existing backlog, while protecting households. In addition, to preserve the proper functioning of the European electricity market, the MFA has proposed that Germany should be divided into several BZs (NOU, 2024). The Commission's conclusions formalise an explicit and unprecedented critical position of a Norwegian state entity towards Germany, a key market and political actor within the same EU, and towards the current structure of the European electricity market. Moreover, the MFA critique highlights the criticality of electricity in bilateral interdependence, as the BSR applies well beyond traditional energy policymakers, with the MFA not tasked with managing Norway–EU electricity interdependence. In deeply integrated markets, such as Norway and the EU, BSR prompts many state-controlled and state-power entities to demand a feedback effect in case the governed interdependence underdelivers on its promises.

The situation worsened further in 2024, with episodes of so-called *Dunkelflaute*—reduced supplies from renewable sources and an increasing use of gas-fired power to compensate (Honoré & Sharples, 2024). In early December 2024, this caused hourly electricity prices in Southern Norway to reach their highest level since 2009, more than three times higher than the 2025 average for the NO1 BZ and around five times

higher than the 2025 average for NO₂ BZ (Figure 4). These prices were almost 20 times higher than the previous week. Repeated price spikes and higher electricity prices have affected interdependence with the EU, shifting Norway's physical and social infrastructural power in depth. Energy Minister Terje Aasland, from the Labour Party, did not hesitate to describe it as a "shit situation," which also reignited political controversies with the Centre Party. The latter has long opposed existing CBEIs with Denmark and advocated preserving nationalism, sovereignty, and territoriality as primary institutions when dealing with CBEIs with the UK and Germany (Milne, 2024). Implicitly for actors, focused on the reverberations on Norwegian domestic electricity prices, BSR has emerged as a non-negotiable part of the domestic social contract. Criticism from trade unions of the push to increase electricity integration with the EU has further intensified. Demands have ranged from Norway's withdrawal from ACER and the Energy Union to renegotiating cables to Germany and the UK, and the refusal to extend the SK 1 and SK2 cables (Schjetne & Vadla, 2025). Industrial Action (*Industriaksjonen*), a group representing non-state entities such as the NGO No to the EU, the Red Party, and 60 trade unions in the industry, infrastructure, energy, transport, and public sectors, has advanced demands for a "politically regulated price level," and the restoration of national control over "our hydropower and energy sources" (Denstad, 2024). Framing it as social infrastructure, promoters said this would ensure predictable, lower electricity prices compared to EU countries, reclaim full control over power flows, and control the sale of surplus power. Representing non-state society, the group accused power producers of charging up to 30–40 times the average costs of power production since 2021, thus before the Russian invasion of Ukraine. Power cables to Germany and the UK have been pointed out as providing "a record export of power with price contagion and imports of unpredictable sky-high electricity prices" (Denstad, 2024). These demands have intensified the debate across the Norwegian political spectrum, fragmenting the consensus on electricity trade with the EU. Through the feedback effect granted by BSR, non-state actors have requested reconsideration of the physical infrastructure aimed at electricity production, transmission, and trade. This, in line with social infrastructure closer to state territorial-bounded and sovereign interests of Norway.

6.3. From a Governed Green Alliance Towards an Ungoverned Electricity Interdependence?

The tensions within the coalition exploded in January 2025, with the Centre Party's opposition to the EU clean energy package and its implications for the electricity market. Meanwhile, the domestic debate regarding CBEIs signalled a primacy of nationalism, sovereignty, and territoriality among primary institutions. The Norwegian government, led by the Labour Party, explicitly opposed the renewal of interconnectors with Denmark—the Skagerrak 1 (SK1) and Skagerrak 2 (SK2) in 2029 (Figure 6)—as they are expected to reach the end of their technical service lives in 2026 and 2027. At the same time, Oslo ordered Statnett to "postpone planning for new subsea interconnectors to other countries until 2029" (Government of Norway, 2025a; see Figure 6).

This same order complicates Statnett's role as a member of ENTSO-E, a key secondary institution granting the efficiency of the European energy market. This clearly emphasises the conflictual positioning and hierarchy among the primary institutions populating the Norway–EU electricity interdependence. In this case, nationalism, sovereignty, and territoriality supersede the market, as the Norwegian government prioritises delivering affordable electricity and a secure power supply by limiting the CBEIs' interconnectedness with the EU. Additionally, the government has introduced measures to lower electricity bills through a new "Norway Price" scheme (*Norgepris*). A fixed price of NOK 0.4 per kWh aims at "stabilising



Figure 6. The location of the SK1 and SK2, circled in red, in the Interconnected Network of Grids in Northern Europe (discard the in-figure captions). Source: ENTSO-E.

household electricity costs” and maintaining “strong, national control over energy distribution” (Government of Norway, 2025a). Highlighting the role of BSR in understanding the domestic dynamics of governed interdependencies and the growing pressure from non-state actors on state-controlled entities, Energy Minister Aasland referred to the fact that “the Government does not want Norway to align itself more closely with the European energy system” (Government of Norway, 2025a). In doing so, he cited the “great instability in the European power markets,” which also anticipates possible future repercussions on electricity interdependence. Forced to review recent policies affecting Norway’s infrastructural power and physical and social infrastructure, the feedback effect of BSR came to shape interdependence profoundly. In fact, the Norwegian government affirmed “no to new electricity interconnectors, and we will not be adopting the EU’s controversial market rules” for the entire legislation (Government of Norway, 2025a). An EU ambassador in Oslo reacted by arguing that “Norway looks selfish, trying to keep this electricity for itself” amid increasing revenues from gas exports (Milne, 2025). The resulting political campaign for the September 2025 elections, leading to another government led by the Labour Party in coalition with minor

left-wing parties, saw a striking and unprecedented surge in opposition to further CBEIs with the EU. All major parties supported domestic consumers facing higher bills and boosting the competitiveness of the domestic economy by keeping electricity prices low; only the Conservatives did not explicitly support limiting the infrastructural integration with the European electricity market (Arbeiderpartiet, 2025; Fremskrittspartiet, 2025; Høyre, 2025). Some political forces even reinforced their stance on preserving all primary institutions against the market. Multiple parties advocated extending the state's control over hydropower as a key part of the infrastructure of Norwegian society (Rødt, 2025; Senterpartiet, 2025; Sosialistisk Venstreparti, 2025). Exposed to geopolitical turbulence, tensions among primary institutions are structurally pushing the Norwegian government to reconsider its physical and social infrastructural power through electricity, with serious implications for electricity interdependence with the EU.

In its 2025 development plan, the state-owned transmission operator Statnett asserts that it has been preparing to secure electricity supplies even in times of crisis. The plan considers which measures could be useful to implement, including a scenario with war on Norwegian soil (Statnett, 2025). This explicitly makes electricity interdependence exposed to other types of power beyond infrastructural power. In response to complaints from the EFTA Surveillance Authority—the agency monitoring compliance with the EEA Agreement—about market distortion created by the Norway Price scheme, the Ministry of Energy asserted that the scheme aims to reduce Norwegian households' electricity expenses (Government of Norway, 2025b). The government has framed *Norgepris* as a social infrastructure of Norway's state infrastructural power, a measure required by higher spot prices, increased volatility, and internal differences in BZs caused by the increased interconnection with neighboring systems. Compared to the recent past, the same policy pragmatically explains the renewed centrality of primary institutions such as sovereignty, territoriality, and nationalism in Norwegian energy policymaking, with looming consequences for the electricity interdependence with the EU. The domestic shift in the political debate, explained in this section, clearly demonstrates the implications of the BSR feedback effect on the external electricity interdependence with the EU. The Norway–EU case study proves the usefulness of the proposed framework in understanding state–society relations in electricity interdependencies. Specifically, it details the primary institutions and modalities through which governments reclaim control over social and physical electricity infrastructure. BSR dynamics are thus key to understanding how, to govern electricity interdependencies, states reaffirm their primacy in delivering affordable electricity and secure power supplies as social infrastructure through physical infrastructure such as CBEIs. This perspective is even more compelling, particularly in times of energy crisis.

7. Conclusions

The modalities through which the Norwegian government aims to keep electricity prices affordable and power supplies secure have required a comprehensive review of the CBEIs' governance. With only a limited number of economic actors and state-owned entities (mainly power producers and traders) benefiting from Norway–EU electricity interdependence, the country's civil society has reclaimed control over the state's energy resources, forcing several political actors, including the Labour Party, to adapt to a new scenario. Even Norway's hydropower-based physical and social infrastructural power—built on vast hydro resources—proved unmanageable amid political instability and an energy crisis. During 2024–2025, CBEIs represented the weak point in Norway's infrastructural power within the asymmetrical electricity interdependence with the EU, even causing a major political crisis. Because of this, CBEIs have also borne

the brunt of the BSR, with Oslo reclaiming the power to organise domestic and external electricity infrastructure according to its interests. Structurally and discursively, this means that CBEIs (SK1 and SK2) and electricity trade will suffer severe structural restrictions. Moreover, this trend opens up relational implications, including the possibility that Norway could further limit future power interconnections with the EU.

The “two-way street” feedback effect, typical of democracies and originating from non-state groups and representatives, makes the investigation of the BSR in Norway replicable to other electricity interdependencies. The feedback effect on interdependence has been so strong as to even trigger a government collapse and new elections in one of the most stable political environments in Europe. With integration into the EU energy and electricity market as key variables, this development should deeply alarm policymakers in Brussels. The case illustrates how the energy transition, coupled with geopolitical tensions, could lead to disruptive energy and political consequences that could outlast government changes. As an underinvestigated political phenomenon, the proposed framework could help shed light on the domestic and external implications of (un)governed electricity interdependencies.

As electricity is a crucial aspect of the Norwegian state’s physical and social infrastructural power, future tensions among primary institutions are poised to proliferate in a less jointly governed and more unilateral Norway–EU electricity interdependence. Strengthening nationalism, sovereignty, and territoriality as primary institutions risks destabilising existing electricity interdependencies. This represents a major threat to the transformation of global energy systems, adherence to shared European principles and values in policymaking, and the market as a primary institution. As explained in the analysis, BSR dynamics also have consequential effects beyond the institutional state (Norway) and on the interdependent party (EU) and the primary institutions forming the governed interdependence. As this article shows, the market as an institution worked inefficiently in limiting these tensions; the significance of environmental stewardship in the Norway–EU interdependence will intensify; nonetheless, this appears insufficient to ensure the interdependence’s long-term stability. If tensions among primary institutions continue to affect the CBEIs–IR nexus and the physical and social infrastructural power of the Norwegian state—or that of other states within the European electricity market—policymakers will be destined to intervene continually and reactively. Controversially, because of the BSR’s significance in democratic European energy governance, this dynamic could further fuel the prioritisation of nationalism, sovereignty, and territoriality as dominant primary institutions. Of concern, considering another energy crisis looming in Europe—triggered by tensions in the Persian Gulf—more governments could step in to reclaim control over physical and social infrastructure in electricity interdependencies through increased control over CBEIs.

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