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To what extent is energy policy harmonisation across the EU key to energy transition in the region?

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Abstract

Coordinating decarbonisation across the European Union presents a central governance challenge, as ambitious climate objectives must be pursued through energy policy within a fragmented regulatory landscape shaped by national priorities for economic competitiveness and energy security. EU energy policy is intended to address this challenge by aligning rules and creating regulatory certainty to enable the green transition. However, its one-size-fits-all approach risks overlooking national contextual and practical constraints. This paper investigates to what extent energy policy harmonisation across the EU is key to the region's energy transition, qualitatively examining how harmonisation is experienced by energy stakeholders in Brussels, Germany, and France. Existing conceptualisations frame harmonisation as either limited alignment preserving national sovereignty or as an expression of supranational integration. This paper refines these accounts by moving beyond reliance on legal assessments and policy documents to examine the practical, stakeholder-level processes through which harmonisation is enacted, addressing the implementation gap between policy design and practice. Drawing on sixteen semi-structured interviews with stakeholders in Brussels, Germany, and France, thematic analysis highlights three key areas: balancing economic competitiveness with climate ambition, overcoming bureaucratic barriers to renewable deployment, and harmonising grid connections and market rules. The findings reveal that energy policy harmonisation emerges as a practical tool whose effectiveness depends on coordinating economic, regulatory, and technical considerations to enable cross-border renewable deployment. This is integral for EU policy makers to ensure that EU energy policy is reliable and actionable rather than aspirational for member states.

Introduction

The European Union's commitment to achieving climate neutrality by 2050 represents one of the most ambitious energy transitions attempted by any regional bloc. Yet this transition unfolds within a governance structure characterized by fundamental tensions between

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collective action and national sovereignty. Unlike other policy domains where the EU exercises clear competence, energy policy remains deeply intertwined with questions of national security, economic competitiveness, and domestic political preferences (Ringel & Knodt, 2013). As renewable energy deployment accelerates and decarbonisation targets tighten, a critical question emerges: to what extent is energy policy harmonisation across the EU key to achieving this regional energy transition?

This question carries profound implications for both policy design and practical implementation. Harmonisation could provide the regulatory certainty and cross-border coordination necessary for large-scale renewable infrastructure investment, create level playing fields that prevent competitive distortions, and enable the technical integration required for managing intermittent renewable generation across borders. Conversely, overly rigid harmonisation might stifle innovation, impose inappropriate one-size-fits-all solutions on diverse national contexts, and create bureaucratic barriers that slow rather than accelerate deployment. The challenge lies in determining where coordinated approaches add value and where flexibility serves transition goals more effectively.

Existing scholarship offers competing perspectives on this challenge, yet significant empirical gaps remain. Most research (e.g., Knill & Tosun, 2009) relies on policy document analysis and legal assessment, providing limited insight into how diverse stakeholders experience harmonization processes. Policymakers, energy companies, financial institutions, and civil society organizations navigate EU energy governance daily, yet their perspectives on what harmonisation achieves or fails to achieve remain underexplored. Furthermore, the energy landscape has shifted dramatically in recent years through crisis-driven policy responses and heightened climate ambition (European Commission, 2019, 2022), raising questions about whether existing frameworks adequately capture contemporary dynamics.

This research addresses these gaps through qualitative investigation of stakeholder perspectives across multiple dimensions of EU energy transition. By conducting sixteen semi-structured interviews with public and private actors in Brussels, Germany, and France during summer 2025, this study examines how harmonisation influences three critical aspects of energy transition: the economic and political trade-offs between competitiveness and climate ambition, the regulatory dynamics affecting renewable deployment, and the technical coordination requirements for integrating variable renewable generation. The research investigates empirically where and how policy coordination matters for transition outcomes.

The findings reveal a nuanced picture. Energy policy harmonisation emerges neither as a panacea for transition challenges nor as an impediment to progress, but rather as a governance tool whose effectiveness depends heavily on context, design, and implementation. In some domains, particularly carbon pricing alignment and cross-border infrastructure frameworks, harmonisation appears essential for preventing coordination failures and enabling scale. In others, especially concerning bureaucratic procedures and local deployment mechanisms, excessive standardization creates barriers that undermine transition goals. Perhaps most significantly, the research identifies substantial gaps between regulatory harmonisation on paper and functional coordination in practice, particularly regarding the physical infrastructure requirements for renewable integration.

Understanding these distinctions matter for EU energy governance going forward. As decarbonisation pressures intensify and member states navigate conflicting imperatives around energy security, affordability, and sustainability, determining where harmonisation helps and where it hinders becomes increasingly crucial for policy design.

Literature Review

Foundations of policy

Policy harmonisation as a concept has been key to European integration debates historically (Majone, 1996). However, it's precise meaning and scope remains contested. Scholars in the field of European integration studies emphasise different dimensions of policy in their work (legal, regulatory and market based) and often disagree on whether harmonisation should be the ultimate goal of EU governance or one of several instruments to achieve policy alignment and success. In the context of EU energy policy, the lack of consensus is evident, and to measure its success a concrete definition and criteria is necessary. The following literature review reveals diverging schools of thought – integrationist, heterogeneity and multi-level governance - on whether harmonisation is defined narrowly as legal approximation or more broadly as an ongoing process of coordination.

Dupont and Primova (2011) approach harmonisation through the lens of climate policy integration. They argue that harmonisation should not be reduced to a form of legal approximation but should be seen as part of a broader integration process where climate objectives are embedded across energy policy sectors. Their analytical framework builds on the neo-functionalist idea of spillover effects and an institutionalist attention to policy processes. It gives evidence that integration requires more than treaty provisions and depends on national commitment, functional overlap, actor participation and local context. This perspective suggests that success is not simply measured by the adoption of common rules but whether the rules meaningfully align and foster progress towards long term EU climate goals.

In contrast, Ringel and Knodt (2013) emphasise a tailored heterogeneity of EU energy governance. They argue that energy remains a policy area wherein harmonisation is inherently constrained by diverging national interests, resource endowments and political priorities. Currently, the EU has achieved only partial coordination and 'soft convergence' (Ringel and Knodt, 2013), in contrast to full legal and regulatory coordination, through indicative targets and flexible mechanisms. According to this outlook, harmonisation is not a destination but rather a balancing act between supranational steering and national autonomy. Here, success is not defined as uniformity but as maintaining sufficient convergence to prevent fragmentation while respecting member states autonomy. However, since this research paper in 2013, crises like Ukraine and the new Green Deal have arguably strengthened harmonisation pressures, but heterogeneity still persists.

On the other hand, Knill and Tosun (2009) caution against assuming harmonisation is always possible or desirable. They argue that fully harmonisation often clashes with the multi-level governance (MLG) structure of the EU, which inherently values diversity and subsidiarity. Instead, it is highlighted that alternatives such as mutual recognition, open coordination and minimum harmonisation (only setting baseline standards) are better when preserving flexibility while reducing regulatory barriers. In this case, success is not judged by the elimination of national diversity but by the effectiveness of different modes of alignment in balancing efficiency, legitimacy and adaptability. When taken together, these academic literatures reveal a spectrum of understandings: harmonisation as integration (Dupont and Primova, 2011), as a convergence under constraint (Ringel and Knodt, 2013) and as one consideration among many in achieving successful policy (Knill and Tosun, 2009).

Energy policy harmonisation history

In the history of European integration, energy policy studies highlight harmonisation has evolved unevenly. When examining the development of EU level frameworks (the interaction of national competences and policy harmonisation) a trajectory is revealed, characterised by

cyclical advances and retreats. While early attempts at common energy frameworks focused on coal and nuclear cooperation, later decades shifted towards liberalisation, market integration and climate objectives.

Early on the ECSC (1951) and Euratom (1957) provided limited integration. Greater momentum came with the 1990s liberalisation directives (96/92/EC, 98/30/EC) which mandated market opening. These are interpreted as minimum harmonisation (Knill and Tosun, 2009) as they set baseline standards but leave discretion, thus producing uneven implementation. Success here was measured through gains in efficiency, but national monopolies were still prevalent. The 2000s marked a turn in climate policy, however. The 20-20-20 package and the 2009 Renewable Energy Directive introduced binding national targets from the EU. This marked the start of climate policy integration where environmental goals were embedded in energy governance (Dupont and Primova, 2011).

However, these directives show convergence was incomplete as Germany and Spain advanced rapidly through feed in tariffs, while others lagged. The EU ETS (2005) represented deeper supranational harmonisation due to the creation of a common carbon price. Przybojewska (2018) highlights the use of hard harmonisation methods while national add-ons (e.g. UK carbon floor price) revealed persistent heterogeneity. On the other hand, recent developments favour crisis driven integration in particular after the 2022 Ukraine war. The Green Deal (2019) raised targets and the REPowerEU plan (2022) introduced mandatory gas storage and joint procurement. These reflect Dupont and Primova's claim that crises accelerate integration. However, sovereignty tensions persisted as member states struck bilateral deals.

Energy Transition and Policy coordination

Energy transition research draws primarily on transition studies and governance literature. Scholars deploy different frameworks to analyse systemic change which shape how harmonisation is evaluated. The multi-level perspective (MLP) (Geels, 2011) presents transitions as interactions between niches, regimes and the landscape. EU harmonisation can nurture niches (e.g. offshore wind, hydrogen) by providing consistent rules and scaling innovations across borders. The European Green Deal exemplifies landscape level pressure creating space for renewable regimes. Success in this framework is systemic where the alignment of institutions that allows niches to disrupt regimes. The energy justice framework (Heffron & McCauley, 2018) evaluates fairness by focusing on distributional, procedural and recognitional dimensions. It highlights whether binding targets impose a disproportionate burden on coal reliant states and whether mechanisms like the Just Transition Fund mitigate inequalities. Here, success is defined as not only emissions reductions but equitable burden sharing. The Multi-Level Governance (MLG) approach (Jordan & Schout, 2006) highlights negotiation between EU, national and regional actors. The Renewable Energy Directive and other directives combine binding targets with national discretion and reflect partial convergence. Success is defined as effective coordination without undermining diversity.

However, comparative evidence reveals contradictions. The Nordic market shows how technical harmonisation of grid standards can deliver efficient renewable deployment. On the other hand, the Iberian exception in 2022 illustrates divergence where Spain and Portugal capped gas prices to protect consumers, prioritising national flexibility over market rules. Ringel and Knodt (2013) highlight similar divergence in renewable support schemes, characterising outcomes as "soft convergence."

The outcome is a range of conclusions. According to some research, harmonisation speeds up deployment by lowering investor uncertainty (Przybojewska, 2018). To others,

decentralisation encourages innovation because it allows for experimentation through a variety of schemes (Ringel & Knodt, 2013). Competing definitions of success such as technocratic (emissions reductions), pragmatic (affordability) or normative (fairness) give rise to contradictions. The question of how harmonisation and transition interact across all three dimensions remains unanswered as few works attempt to integrate these perspectives.

Gaps in Literature

The literature on energy transition and harmonisation is fragmented despite extensive study since studies take a conceptually isolated approach. Governance theorists investigate tools like minimal harmonisation (Knill & Tosun, 2009), integration scholars concentrate on legal convergence (Dupont & Primova, 2011) and energy policy assessments highlight market alignment (Ringel & Knodt, 2013). Harmonisation is viewed as backdrop by transition theorists, who study systemic change instead. In order to evaluate harmonisation as a multifaceted process influencing markets and transitions, few publications combine these threads.

In terms of methodology, the majority rely on legal and policy documents. For instance, Knill and Tosun's study is based on treaties and directives. Although helpful, these assessments do not uncover how stakeholders experience or contest harmonisation. Studies that rely on interviews are uncommon, therefore it is unclear if formal convergence leads to meaningful results. In addition, Western Europe is the predominant geographical region covered. Although essential to burden sharing discussions, Eastern states are less recognised than Germany, the United Kingdom and Scandinavia. The reliance of Greece on imports, Hungary's cautious stance on climate change and Poland's dependence on coal exemplify the impact of national diversity on the transition process. Generalisations regarding the EU are undermined by insufficient analysis of these circumstances.

A significant amount of scholarship predates the European Green Deal (2019) and REPowerEU (2022). Ringel and Knodt (2013) identified "soft convergence" while Dupont and Primova (2011) analysed climate policy integration prior to the acceleration of crisis driven integration. Recent policies, including joint gas procurement, indicate progress in harmonisation in emerging areas. However, concerns regarding justice persist as literature has not fully accounted for these developments. To address these gaps an integrated framework, empirical evidence from stakeholders, a broader geographical focus and temporal updates are necessary. This study integrates theories of governance, justice and integration while utilising primary interviews to evaluate the significance of harmonisation in the EU's transition.

Methodology

Data Collection

This research employed a qualitative approach through utilising semi structured interviews to examine the importance of energy policy harmonisation in driving the EU’s energy transition. Qualitative research methods were better suited to encapsulate the impact of unilateral EU energy policy rollout on member states and stakeholder relationships - aspects difficult to capture through quantitative methods.

Semi structured interviews lasting 30-45 minutes were optimal as they allowed participants to discuss sensitive issues freely, such as electricity system restructuring impacts on company strategy and energy affordability concerns – topics that would likely be withheld in quantitative approaches.

To combat researcher bias, our standardised interview guide was comprised of non-leading, open-ended questions, ensuring that participants were asked about the same key thematic areas. Probing was only utilised to elaborate on emerging ideas that overlapped with broader themes. To reduce social desirability bias, participants were provided with a brief overview of the topics covered in the interview instead of a full list of questions to enhance validity in insights.

All interviewees provided written informed consent and were assured of confidentiality, anonymity, and their right to withdraw. We received researcher ethics training, and our ethics form was approved by a dedicated member of the LSE Laidlaw team. These measures encouraged participants to respond candidly, improving the credibility of our findings.

Sampling Strategy

16 semi structured interviews were conducted both in-person and virtually with private and public stakeholders across Brussels, Germany and France. Germany's phase out of coal and nuclear energy positions it as decarbonisation frontrunner, making it key for assessing energy transition challenges. Brussels houses the EU Commission, enabling access to EU policy analysts who offered insights into policy motivations, economic incentives, lobbying roles and cross-national concerns. France's unique energy mix which provided contrasting models of energy security. Moreover, France and Germany's influence in the EU was essential in understanding their role in enhancing bureaucracy and instability.

Purposive sampling was utilised as this research required insights from stakeholders with expertise in implementing, responding and facilitating the EU's green transition. Despite low response rates due to data collection coinciding with the June–August holiday period, dividing outreach among team members maximised interview opportunities. Online platforms such as LinkedIn and directly organisations emails broadened reach and improved response rates.

Analytical strategy

Thematic analysis was employed to analyse interview data. Transcripts were reviewed and stakeholder perspectives systematically categorised into broader themes in line with the research question. This interpretive method accommodates diverse perspectives and allows for themes to emerge inductively.

While the sample size was relatively small due to availability, time constraints and stakeholders' seniority efforts ensured diverse stakeholder roles and institutional backgrounds. This limitation was addressed not only through semi-structured interviews that uncovered unforeseen factors and sensitive issues, but also triangulated findings with policy documents and academic literature to enhance the validity and credibility of the research.

The semi-structured format allowed participants flexibility to elaborate on issues relevant to their expertise while ensuring fundamental topics were converged consistently, enabling meaningful comparison and supporting overall analysis reliability.

Findings

The central finding of this research indicate that energy policy harmonisation is crucial for the EU's energy transition, but its effectiveness depends on balancing economic, regulatory, and technical considerations to ensure practical, cross-border deployment of renewables. Drawing from our interviews, these insights converge around three key themes: (1) achieving economic competitiveness while addressing climate ambition and flexibility, (2) overcoming bureaucratic barriers to accelerate the deployment of low-carbon technologies, and (3) developing the infrastructure essential for sustainable renewable energy systems (RES) deployment.

Achieving economic competitiveness versus addressing climate ambition and flexibility

The EU Green Deal, as covered in our interviews, is the EU's new growth strategy which aims to transform the EU into a modern and resource-efficient economy along with achieving the 2030 Agenda for Sustainable Development. Overall, the deal is essentially a set of policy initiatives to drive innovation in clean technology and green infrastructure which aims to achieve climate neutrality within EU by 2050, along with ensuring competitive economic growth (Fetting, 2020). As evident, the climate ambition within EU is set clear by the EU Green Deal which is in accordance with the Paris Agreement of 2015 i.e., achieve climate neutrality or in other words balance the EU's greenhouse gas (GHG) emissions with equivalent GHG removals or other actions that counteract the warming effects. However, today, when the set-up costs of renewables and low-carbon technologies are high, and the energy relying on intermittent sources like wind and sources requires the development of flexible infrastructure i.e., infrastructure which allows the energy systems to adapt to changing demand and supply conditions—making an economically competitive case for low-carbon technologies and RES systems remains a challenge.

For instance, the high heating system costs for hydropower projects, the lack of domain-specific skills for implementing niche and emerging low-carbon technologies, the high upfront costs for setting up wind plants and the large upfront costs associated with redesigning the existing grid systems as inferred from our interviews. As a policy analyst from the EU Commission emphasised, "energy prices remain too high to compete with gas, even as targets push member states to expand renewables," underscoring the financial strain of maintaining competitiveness during transition. Meanwhile, an associate from Bruegel highlighted that "some countries are so dependent on old infrastructure, such as coal plants, that transition costs are inevitably higher," reinforcing how structural legacies intensify financial pressures. This point towards the substantial direct costs associated with energy transition.

Interviews with CAN Europe, Mission Possible Partnership, and Deloitte noted that public funds continue to support fossil fuel production, with CAN Europe warning that "public money is still going to fossil fuels, making it difficult to ensure a fair and just transition." These indirect costs impede the rate of energy transition. To minimise the impact of these costs, it is here that shared frameworks and energy policy harmonisation can help to avoid the "race to the bottom" wherein the states prioritise short-term competitiveness over long-term transition goals.

Specifically, from our interviews we came across three major areas where policy harmonisation, when considered from the lens of integration, can minimise the costs associated with energy transition i.e., 1) aligning carbon taxes across states, 2) aligning subsidies for low-carbon technologies, RES systems and infrastructure across states and 3) establishing an efficient emissions trading system (ETS) across the EU. The first area was highlighted by associates at MSCI and Deloitte who emphasised that inconsistent carbon pricing "distorts market competitiveness" and undermines investment incentives for greener alternatives, suggesting that a uniform carbon tax would provide both regulatory certainty and economic fairness across the bloc; the second area was highlighted by associates at Bruegel, CAN Europe, MSCI and Deloitte who stressed that disparities in subsidy schemes discourage cross-border collaboration. The final area was highlighted by OECD, emphasising that a cohesive ETS is essential for "price transparency and cost-efficient decarbonisation," warning that fragmented national systems create inconsistent compliance costs.

Additionally, Contracts for difference aim to promote cross-border cooperation of energy and electricity transmission, and to secure energy prices for producers and consumers. This was another area touched by associates at the EU Commission and Deloitte who indicated that contracts of difference and power purchase agreements help stabilise energy prices and

attract long-term investment, asserting that legal harmonisation can accelerate the EU's overall energy transition.

To sum up, based on our interviews, achieving economic competitiveness in EU's energy value chain while addressing EU's climate ambition and flexibility requires the EU member states to 1) acknowledge the importance of policy harmonisation in preventing the "race to the bottom" and to 2) adopt energy policy harmonisation the areas discussed above.

Bureaucratic barriers hinder Renewable Deployment

Whilst policy harmonisation is intended to provide regulatory certainty across member states within the EU, a key finding of this study indicates that policy harmonisation in practice simultaneously reduces uncertainty in legislation whilst also enhancing bureaucracy.

Harmonising EU energy policy enhances bureaucracy

Policy harmonisation has increased fragmentation within the EU through adapting diverse mechanisms such as administrative reporting and directives to overcome regulatory uncertainty. As a result, shifting EU regulation cannot be relied on by investors and developers, stymying renewable development and innovation.

Across multiple private stakeholders, a pattern emerged where shifting EU regulation created a financial risk in investing in renewable projects, indicating how EU regulation fails to encapsulate business practice. This is evident through an associate in Deloitte who indicated that 'Shell might not move Brown assets to green assets because of reporting issues.' This finding is significant because it indicates that overly complex EU regulation prevents strategic advancement of renewable energy, as prolonged compliance requirements prevent implementation.

This is reinforced by an Associate at CERRE mentioned that to kickstart hydrogen projects within the EU, companies must navigate through lengthy EU and national approval procedures, making it hard for localised projects to start materialising. Consequently, delays in development, discourages investment in essential infrastructure. When examined through Sunila's focus on the demonstration principle being undermined by the 'will of the legislator,' such projects risk falling into a 'legal valley of death' (Sunila, 2022), illustrating how ambitious EU energy policies fail to translate into practical support for energy innovation.

The role of corporate lobbying creating a policy-implementation gap

Energy policy harmonisation has a significant influence on how stakeholders regulate their operations, which is essential when successfully leading an energy transition. Yet how energy policy is formulated and how stakeholder interests are incorporated into energy policy is imperative to understand how bureaucratic barriers affects renewable deployment.

A central claim made by participants was that corporate lobbying and pressure from key stakeholders forces the EU to focus on short term goals such as energy security in response to the Russian invasion of Ukraine than the long-term goal of renewable deployment. The reliance on conventional energy sources not only undermined the consistency of EU's climate strategy but also reflects how external factors like geopolitical crises can reshape regulatory priorities, often creating space for powerful fossil fuel companies to reassert their influence over energy policy. This was emphasised by an associate from the Mission Possible Partnership who indicated that even though widespread fossil fuel subsidies need to be phased out, high consumer demand driven by concerns over energy affordability, strengthens the bargaining power of fossil fuel companies, enabling them to shape energy policy in ways that favour their interests. Therefore, by encouraging energy policy harmonisation, organisations will still have leeway to operate in a non-renewable fashion. As a result, demand

for fossil fuels remains high as the energy market ‘will always, to some extent rely on fossil fuels’ (DLA Piper, 2025) which in turn hinders the growth of renewable energy adoption.

This highlights a tension that the EU must grapple with: maintaining the interests of key stakeholders whilst also aiming to meet renewable energy targets. By mediating between diverse interests, the EU tends to focus on ‘input legitimacy’ than ‘output legitimacy’ (Schmidt, 2020), creating policies that are ‘too ambitious’ (MSCI, 2025) and not pragmatic. This creates a policy-implementation gap where policies struggle to materialise in practice. This echoes Ringel and Knot’s study indicating that energy policy harmonisation is contingent on diverging national and stakeholder interest, whereby sufficient convergence should be the priority, not supranational compliance.

Ultimately, the EU’s challenge lies in balancing inclusivity with efficiency. These findings allude to the need of stronger scrutiny and accountability mechanisms to ensure that energy policies translate from ambitious commitments into coherent, enforceable, and effective renewable deployment across member states.

Grid Standards, Interconnections, and Market Rules: Essential Infrastructure for Renewable Integration

The interview findings provide compelling evidence that harmonisation of grid standards, interconnections, and market rules is not merely beneficial but absolutely essential for integrating intermittent renewables into the EU energy system. Three key results emerged that demonstrate both the technical necessity and current inadequacies of harmonisation efforts in managing variable renewable generation.

Grid Restructuring Requirements Exceed Current Harmonisation Capabilities

The research reveals that renewable integration demands fundamental grid restructuring that current harmonisation mechanisms cannot adequately address. The EU commission interviewee explicitly stated that "renewables strain grid more than gas" and emphasized that "grids must be restructured for renewable dispatch." This technical reality creates unprecedented coordination challenges, as the EU Commission policy analyst noted through the Spanish blackout case where "France interconnection" provided critical system support, demonstrating both the potential and limitations of existing cross-border infrastructure.

The interviews consistently highlighted infrastructure inadequacies that harmonised standards have not resolved. A German climate economist identified persistent problems with "not enough storage" and consumers lacking "flexible demand," while technical limitations mean grid operators "can only control disconnection" rather than actively managing variable generation. This finding extends theoretical understanding by revealing that renewable integration creates qualitatively different technical requirements that existing harmonisation frameworks were not designed to address.

These results align with technical literature emphasizing that variable renewable integration requires system-wide coordination capabilities (Ringel and Knodt 2013) However, the interviews reveal a critical gap between theoretical technical requirements and practical harmonisation implementation, suggesting that current approaches may be fundamentally inadequate for the scale of coordination needed.

Market Rule Fragmentation Prevents Cross-Border Renewable Balancing

The study demonstrates that fragmented market rules create systemic barriers to the cross-border balancing essential for managing renewable intermittency. MSCI interviews revealed that despite "Europe holds ~70% of global climate investment funds," persistent "fragmented

European markets with multiple regulatory/tax regimes" prevent effective capital allocation for integrated renewable systems. The DLA Piper legal experts corroborated this, identifying "contractual uniformity challenges" and "lack of regulatory harmonisation between EU states" that impede cross-border renewable projects.

More significantly, the MSCI respondent noted that "separate energy markets persist" despite technical requirements for "interconnectedness between electricity and gas systems." This fragmentation prevents the flexible market mechanisms necessary for managing variable generation across borders. The climate economist reinforced this, highlighting that current market structures lack the "flexible demand" mechanisms essential for renewable integration.

This finding challenges Ringel and Knodt's (2013) assertion that 'soft convergence' through flexible mechanisms can adequately manage energy governance challenges. The evidence indicates that renewable energy's technical characteristics require deeper market integration than traditional coordination approaches can achieve, supporting arguments for more comprehensive harmonisation frameworks.

Technical Standards Implementation Gaps Undermine Integration Potential

The research identifies critical implementation gaps that prevent existing technical standards from enabling effective renewable integration. While harmonised technical standards exist on paper, the EU Commission respondent noted that "administrative burdens and national delays" prevent their practical deployment. This creates a paradox where theoretical harmonisation exists, but functional integration remains elusive.

Another interview revealed that current technical capabilities are limited to basic grid management "can only control disconnection" rather than the active demand response and storage coordination needed for variable generation management. An economic advisory manager emphasized "technology needs to be scaled" and identified persistent "infrastructure with grids" problems that prevent harmonised standards from translating into functional integration.

This finding reveals an unexpected disconnect between regulatory harmonisation and technical implementation. Unlike other policy areas where harmonised rules can drive convergence (Dupont & Primova, 2011), renewable integration requires physical infrastructure coordination that cannot be achieved through regulatory instruments alone.

Theoretical Implications

These results provide strong empirical support for arguments emphasizing technical harmonisation as essential infrastructure rather than optional coordination. The findings suggest that while Ringel and Knodt's (2013) framework of 'soft convergence' and flexible mechanisms may adequately address traditional energy governance challenges, renewable integration specifically requires a different approach. The evidence indicates that the technical interdependencies created by intermittent renewables demand hard infrastructure coordination beyond the traditional policy harmonisation approaches Ringel and Knodt examined.

The results also extend Dupont and Primova's (2011) integration framework. While they emphasized policy coordination and functional overlap across sectors, our findings reveal that renewable integration creates physical and technical spillovers demanding infrastructure-level harmonisation. The Spanish blackout case, where French interconnection provided critical system support, exemplifies how renewable intermittency requires hard infrastructure coordination beyond the institutional processes Dupont and Primova examined.

Practical Implications for EU Energy Transition

The findings highlight significant challenges with current approaches to renewable integration in the EU. The evidence reveals substantial gaps between existing regulatory coordination mechanisms and the technical requirements for managing variable generation systems. Interview participants consistently identified infrastructure inadequacies, market fragmentation, and implementation barriers that current harmonisation frameworks have not resolved.

These findings suggest that technical harmonisation of grid standards, interconnections, and market rules deserves greater policy attention than it currently receives. While regulatory coordination has been the primary focus of EU energy governance, the research indicates that the physical and technical dimensions of renewable integration may require different coordination mechanisms. Further research examining the policy outcomes of various technical harmonisation approaches would be valuable for developing effective strategies for EU energy transition goals.

Conclusion

Our research has considered three dominant schools of thought in the energy policy harmonisation literature i.e., 1) the integrationist school of thought as proposed by Dupont and Primova, 2) the heterogeneity school of thought as proposed by Ringel and Knodt and 3) the multi-governance (MLG) school of thought as proposed by Knill and Tosun. The integrationist school emphasises on the broader integration process where climate objectives are embedded or integrated in the energy policy sectors; the heterogeneity school emphasises on adapting energy policy to diverging national interests, resource endowments and political priorities; and the MLG school emphasises on the inherent diverse and layered nature of energy policy. Based on our findings, we argue that energy policy harmonisation, when viewed from these different schools, is necessary for EU to accelerate its energy transition.

Our findings classify the insights we got from our 16 semi-structured interviews into three broad themes to catalyse EU's energy transition i.e., 1) achieving economic competitiveness versus addressing climate ambition and flexibility, 2) bureaucratic barriers versus acceleration of deployment and 3) building infrastructure for sustainable RES deployment. As we show from our findings, to strike a balance between economic competitiveness and climate ambition, harmonisation across the areas of aligning carbon taxes across states; aligning and promoting subsidies for low-carbon technologies and cross-border RES infrastructure; and aligning policies for establishing an efficient cross-border ETS is vital. Next, with respect to the regulatory side of harmonisation, our findings make us acknowledge that certain bureaucratic frameworks are vital for establishing sustainable PPPs and pricing schemes for customers, however in certain cases excessive bureaucratic barriers are likely to hinder renewable deployment. Hence, the key energy policy challenge for EU lies in balancing inclusivity and equity along with efficiency and innovation. EU can potentially address this challenge by taking a more nuanced approach to energy policy harmonisation which integrates the integrationist policy approach at a macro-level to achieve inter/cross-border inclusivity and equity while adopting a more heterogeneous approach at a local level to promote efficiency and innovation.

Finally, to build infrastructure for sustainable RES deployment we argue that harmonisation across grid standards, interconnections and market rules is not merely beneficial but essential in integrating intermittent renewables into the EU energy system. However, based on our findings, at present to achieve such an integration is challenging because of three reasons i.e.,1) the current grid restructuring requirements exceed the harmonisation capabilities, 2) market rule fragmentation prevents cross-border renewable balancing and 3) technical standards implementation gaps undermine integration potential.

To sum up, our research shows the critical role of energy policy harmonisation for EU to achieve its energy transition goals. At present, there is a need and potential for EU to harmonise its energy policy across various dimensions in order to strike a balance between economic competitiveness and climate ambition; a balance between bureaucratic barriers and acceleration deployment; and to build sustainable RES infrastructure. All of this will help EU to accelerate its energy transition journey.

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References

Dupont, C., & Primova, R. (2011). Climate policy integration into EU energy policy: Progress and prospects (DIIS Report 2011:08). Danish Institute for International Studies.

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environmental Innovation and Societal Transitions, 1(1), 24–40. https://doi.org/10.1016/j.eist.2011.02.002

Heffron, R. J., & McCauley, D. (2018). What is the “Just Transition”? Geoforum, 88, 74–77. https://doi.org/10.1016/j.geoforum.2017.11.016

Jordan, A., & Schout, A. (2006). The coordination of the European Union: Exploring the capacities of networked governance. Oxford University Press.

Knill, C., & Tosun, J. (2009). Post-regulatory EU governance: What role for regulation? Regulation & Governance, 3(4), 429–444. https://doi.org/10.1111/j.1748-5991.2009.01064.x

Majone, G. (1996). Regulating Europe. Routledge.

Przybojewska, P. (2018). The limits of energy market harmonisation: The case of the European Union Emissions Trading System. Energy Policy, 118, 665–672. https://doi.org/10.1016/j.enpol.2018.03.073

Ringel, M., & Knodt, M. (2013). The governance of the European energy policy: Evolution and current challenges. Energy Policy, 55, 373–382. https://doi.org/10.1016/j.enpol.2012.12.037

European Commission. (2009). Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Official Journal of the European Union, L140, 16–62.

European Commission. (2019). The European Green Deal (COM (2019) 640 final). Brussels: European Commission.

European Commission. (2022). REPowerEU plan (COM (2022) 230 final). Brussels: European Commission.

European Parliament and Council. (1996). Directive 96/92/EC concerning common rules for the internal market in electricity. Official Journal of the European Communities, L27, 20–29.

European Parliament and Council. (1998). Directive 98/30/EC concerning common rules for the internal market in natural gas. Official Journal of the European Communities, L204, 1–12.

European Parliament and Council. (2009). Directive 2009/29/EC amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community. Official Journal of the European Union, L140, 63–87.
Interview with Brack, A. Interviewed by Ferdinand and Srinath. Director, Head of Practice, Energy, Mobility and Sustainability, Centre on Regulation of Europe, (Brussels, 10th June 2025)

Sunila, K., & Ekroos, A. (2022). Regulating radical innovations in the EU electricity markets: time for a robust sandbox. *Journal of Energy & Natural Resources Law*, *41*(1), 5–25. https://doi.org/10.1080/02646811.2022.2088175

Schmidt, Vivien A., 'Conceptualizing Legitimacy: Input, Output, and Throughput', *Europe's Crisis of Legitimacy: Governing by Rules and Ruling by Numbers in the Eurozone* (Oxford, 2020; online edn, Oxford Academic, 23 July 2020), https://doi.org/10.1093/oso/9780198797050.003.0002