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EDITORIAL

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The Politics of Resilient and Just Energy Transitions: Infrastructure and Institutions

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Abstract

Energy transitions involve far more than technological and infrastructural change. They also require societal adaptation. Moreover, ensuring the resilient operation of new energy systems is essential in the current context of increasing international tensions, hostile "grey zone" or "hybrid" operations, and overt military conflicts. However, security-laden responses unavoidably raise justice issues. Transition policy planning and implementation in these conditions, with new infrastructure designs in new locations, unavoidably raise political contestation. Social justice is crucial to the acceptability, long-term social sustainability, and successful implementation of energy transitions. This calls for capable governance and institutions. This thematic issue examines resilience and justice aspects in transition processes where new infrastructures and institution designs are tested. The 11 contributions cover four continents and multiple transition technologies, from heat pumps to small nuclear reactors and offshore wind turbines. This editorial introduces conceptual approaches to the topic and the main findings of individual contributions.

Keywords

energy justice; energy transition; infrastructure; institutions; resilience

1. Introduction

Energy transitions require a wide range of new energy infrastructure. This thematic issue features offshore wind turbines, subsea cables, cross-border transmission lines, electricity grids, pipelines, hydropower plants, small modular nuclear reactors (SMRs), heat pumps, carbon capture, use and utilisation technologies, as well

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as critical minerals mining complexes. Simultaneously, this formidable engineering challenge of infrastructure building and technology application is accompanied by a substantial degree of politics.

According to the Intergovernmental Panel on Climate Change (IPCC), market mechanisms alone will not suffice to achieve a sufficiently rapid low-carbon transition. Hence, institutions accelerating reforms are necessary (IPCC, 2022, pp. 13, 31). Calls for an institutional environment conducive to long-term transition investments are repeatedly heard from the industry (see, for instance, European Roundtable of Industrialists, 2026; Hydrogen Council, 2025). However, the 2020s have witnessed increasing popular contestation of new energy infrastructures and of the transition overall, for example in electoral platforms (e.g., Patterson et al., 2026). Another emerging political issue concerns the resilience expectations for new energy infrastructure set in various jurisdictions. Societies are encountering not only natural hazards, many of which are amplified by climate change, but also energy and raw materials supply concerns caused by sanctions and counter-sanctions, other trade restrictions and strategic autonomy policies, as well as the effects of conflicts and wars. Interstate tensions, offshore infrastructure sabotage, and cyber-attacks are part of the same context (Aalto et al., 2026). Enhancing protective security practices and developing more resilient infrastructures has a security premium with not only monetary and budgetary consequences, but also profound societal justice implications.

Our thematic issue investigates this constellation—the politics of new infrastructure development, the expectations for institutional support and the concomitant controversies, and the thorny resilience/justice dilemmas as societies seek to renew, rebuild, and adapt to new circumstances. In this editorial, we discuss these broad themes in turn whilst also introducing the individual contributions. As each of the broad themes comprises a complex agenda of its own, the brush is inevitably broad.

2. The Politics of New Infrastructure Development

Scholarly literature conceptualises infrastructures in various ways, highlighting material aspects, societal implications, and the ways in which political actors shape and are in turn influenced by infrastructure development (Bueger et al., 2023). Here we approach infrastructure as physical networks that create structural relationships and (inter)dependencies, with important effects on social justice and the resilience of both energy systems and society.

Infrastructure development and governance are sites of political contestation and require adequate institutions for planning, financing, implementation, and management purposes (Wegrich et al., 2017, p. 2). This is particularly true for renewable energy infrastructure, now extensively deployed globally, including high-impact technologies with major social implications, such as automated, data-gathering smart grids, and giant-scale solar and wind power plants. Governments are crucial to these processes but must consider numerous intervening factors, such as security risks, economic implications, and societal acceptance in contexts of increasing public scrutiny and political polarisation (Natili et al., 2026). Addressing this conundrum lies at the core of what we call the politics of renewable infrastructure development.

The contributions to this issue feature several examples of this politics. Prontera and Passalacqua (2026) focus on critical offshore energy infrastructure in Italy, highlighting its increasing securitisation and a shift towards more public-led and threat-based governance approaches. Italy's energy supply and low-carbon

transition are highly dependent on offshore infrastructures. This has spurred the recent proliferation of legislation, agencies and military operations—carefully traced by the authors—aiming to strengthen resilience and security. Shifting from the Mediterranean to the Baltic Sea, Tikk (2026) also examines offshore wind energy but dives into scenarios where this infrastructure becomes a site for dual use. In Poland, for instance, offshore wind turbines have been equipped with surveillance radars and sensors in collaboration with the Ministry of Defence. This raises political and legal issues, as the infrastructure turns from purely civilian to hybrid and military. As the infrastructure may be viewed as a military target, insurance and responsibility issues are cast anew.

Further societal ramifications emerge with each infrastructure type. This is evident in the case studies of new interconnections for hydropower-generated electricity and small nuclear reactors, by Sassi (2026) and Kojo et al. (2026), respectively. Sassi highlights the social functions of governmental and parliamentary intervention in hydropower use in Norway, including an electricity price stability mechanism. To preserve this mechanism, new cross-border interconnector projects with overseas countries were frozen, as higher electricity prices, for example in the UK and Germany, resulted in higher Norwegian prices. In this politics of cross-border electricity infrastructure, the Norwegian government had to choose between domestic social considerations and market integration. Incidentally, the EU and the UK are Oslo's main partners and have faced protracted energy market tightness since gradually abandoning Russian supplies post-2022. Kojo et al. (2026) investigate the plans for decarbonising urban district heating through SMRs in Finland, and the ensuing challenge of securing legitimacy and credibility on the municipal level. The authors find societal perceptions of urgency and concrete viability to be essential to SMR projects going ahead.

Further issues arise when infrastructure deployment occurs in Indigenous lands, undermining local livelihoods and lifestyles. Rotmann et al. (2026) illustrate this through the case of the newly discovered Per Geijer rare earths deposit in Northern Sweden. Its prospective development jeopardises the Gabna reindeer-herding community, already affected negatively by decades of iron ore mining in Kiruna. In such cases, the politics of new energy infrastructure calls for an elusive compromise between the transition's urgency and the socio-economic sustainability of marginalised Indigenous communities. The authors advocate strengthening the legal and policy mechanisms to avoid infrastructure development impinging on Indigenous rights.

As emerges from van Tuijl and Hendlin's (2026) article on the retrofitting of residential buildings in Rotterdam, including heat pump installation and building insulation, not all energy transition infrastructure is large or has extensive cross-border implications. Such infrastructure is no less vital: widespread adoption of heat pumps and the insulation of residential buildings can bolster energy efficiency and decarbonisation.

3. Institutional Support and Contestation

Institutions affecting energy production, trade and policies involve multiple actors, most prominently governments and regulatory agencies, alongside international agreements and frameworks. While some scholars have focused on the "global governors" of energy—international organisations, development banks, inter-state alliances (Florini & Sovacool, 2009)—others have zoomed in on domestic factors, such as state capacity, electoral politics, and regulators (Lockwood et al., 2017). Today, international institutions promoting energy transitions retain significance but face numerous challenges stemming from geopolitical

competition and eroding multilateralism. Meanwhile, states have returned to prominence not just in regulating markets, but also via energy policies including economic (dis)incentives, often harbouring strategic autonomy ambitions (Kuzemko et al., 2024). States must balance several goals, including climate targets, energy affordability to consumers, the corporate quest for profit, and overall societal resilience and security (Aalto et al., 2026). Private and public actors expect the state to provide support and direction. The resulting "renationalised" energy policies consequently become more exposed to domestic political contestation and electoral shifts.

Contributions to this issue explore state-level institutional dynamics with reference to the international context. Akeredolu (2026) emphasises the risks posed by weak institutional structures to implementing the energy transition in Nigeria. In federal political systems like Nigeria's, implementation requires state-level institutional capacity. However, only a few Nigerian states have adopted corresponding policies. Even fewer have dedicated budget lines. The delegation of formal legal powers does not, on its own, deliver capacities for building resilient electricity systems. By contrast, in the United States, challenges to the transition originate primarily at the federal level, where institutional and policy dismantlement following Donald Trump's re-election in 2024 has undermined a seemingly effective regulatory framework. Buchanan Ponczek's (2026) article examines how the administration's recent policies have abandoned measurement and reporting practices, eroded agency authority and administrative capacity, and cut transition funding. In short, extreme electoral contestation and executive change can undermine the required policy and regulatory stability. Any future return to clean energy priorities is cast in doubt as emissions measurement practices and institutions have disappeared.

Takemi's (2026) article examines the subtler tensions in Japan with stable institutions and policy continuity, but concomitant limited domestic resources, mounting geopolitical challenges, and multiple domestic interests. This constellation has led to a strategy of "compelled flexibility," comprising the simultaneous pursuit of diverse technological pathways. With each pathway institutionalised, commitments accumulate while resources are dispersed. This can restrict future convergence and hinder the mobilisation of resources on technologies best suited to Japan's transition.

4. Challenges to Integrating Resilience and Justice in Energy Transitions

The resilience of energy systems is a central theme in several articles of this issue. As Tikk's (2026) contribution shows, the concept of resilience is integral to both policy and academic security discourses; at the same time, resilience remains more specific in referring to the ability to recover from a shock and adapt to changing and often adverse circumstances. Comprehensive, whole-of-society resilience requires citizens to act in a certain way—prepare, respond, recover, and adapt—to establish an additional layer of national defence (Larsson & Rhinard, 2021). As noted by critical security scholars (e.g., Bourke & Schott, 2022), the proliferation of resilience policies has also spurred a debate on the militarisation of society; Tikk's article corroborates this point with empirical evidence from the energy sector. Takemi (2026) also emphasises how profoundly security of supply concerns affect energy policy.

For energy infrastructures planned and built today, resilience requirements differ from the formerly predominant least-cost principle, which focuses on minimising total production cost. Renewable energy development is functional in strengthening resilience thanks to the decentralisation and the broader

geographical spread of energy systems it affords. Diffuse siting and transport routes minimise vulnerabilities. For example, geographical spread in large wind power parks multiplies targets for hostile actors and decreases the consequences of disruptions to one unit. At the same time, solar- and wind power-based electrification means reliance on one dominant energy carrier and data intensity due to the need to balance production and consumption in numerous spots; in turn, the data intensity increases cyber vulnerability. This dual picture reiterates the need for governance, as shown by Prontera and Passalacqua (2026). Moreover, in many jurisdictions, grid balancing requirements lead to new international dependencies linked to cross-border transmission lines (see e.g., Vakulchuk et al., 2020). Sassi's (2026) contribution illustrates the unintended effects of such cross-border infrastructure, including how the resilience benefits from additional interconnections may compromise other societal goals such as energy price stability and affordability.

Resilience policies can incur justice implications. These include the relocation of energy production and trade facilities, the redistribution of benefits and costs to interest groups, nations and Indigenous groups, and new patterns of resource use. Resilience investments compete with other priorities for budget allocations, such as social welfare expenditure. In this thematic issue, Rogissart and De La Cruz's (2026) analysis of non-price criteria in European offshore wind auctions highlights how resilience considerations are balanced not only with justice but also with sustainability and capacity issues. The article shows how these considerations have become part of public procurement, constituting an important lever of green industrial policies in Europe.

Drawing and expanding on earlier scholarly conceptualisations (notably Jenkins et al., 2016), several contributions to this issue examine energy justice in various corners of the world. Vinoy and Jayaram (2026) and Akeredolu (2026) assess energy justice in the transition policies of fossil fuel-dependent, Global South countries. Vinoy and Jayaram highlight how India's government deploys the justice concept selectively, at times to justify continued reliance on fossil fuels while prioritising energy sovereignty and economic considerations. Coal dependence and a persistent traditional-developmentalist approach hinder swift decarbonisation. Hence, reconciling climate policies with socio-economic stability will be crucial for India's just energy transition. Akeredolu shows that Nigeria's main energy and climate policy documents articulate justice rather than institutionalise it. The country's fragmented governance structure constrains the implementation of distributive, procedural, recognition, and restorative justice measures.

Further contributions reveal how advancing just energy transitions can be daunting also in the Global North. Buchanan Ponczek (2026) shows how recent political turbulence in the United States has overturned the institutional conditions for rendering justice measurable. Rotmann et al. (2026) highlight how critical raw material extraction in Indigenous lands in Sweden involves fundamental issues of recognition, restorative, distributional, procedural, and intergenerational justice. Kojo et al. (2026) illustrate how plans for SMRs in Finnish cities can redistribute risks and benefits in densely populated urban areas, affect marginal and vulnerable groups, and raise procedural questions related to transparency and civil society participation in decision-making. Van Tuijl and Hendlin (2026) emphasise how institutional rigidity and technical-economic constraints can hinder a just energy transition in Rotterdam and propose solidarity mechanisms to partially alleviate the risk of excluding poorer social groups from heating transitions.

5. Concluding Remarks: Towards a Reflexive Approach

The dilemmas concerning resilience and justice touched upon in this thematic issue reveal several unintended consequences, along with the intended ones of transition policies. Finding the most appropriate institutional paths is tricky. Giddens's (1984) ideas of reflexivity point to an approach that is sensitive to the multi-layered complexity and contingency involved. Giddens's reflexivity refers to actors' capacities to acquire competences, to stay aware of their own deeds, adjust, and evaluate the consequences of their own actions. In the big picture, the concern was for modernity to be aware of itself and its transformative effects.

These ideas of reflexivity may be broad social theory but have already had some traction in energy transition scholarship (e.g., Sovacool & Brisbois, 2019). Today they remain powerful for understanding the transition not only as infrastructure building and technology development, but also as being co-dependent on the constitution of society, the choices actors make in those processes, and how they understand and acknowledge the consequences therein. One important corollary is that unless transition politics and infrastructure deployment include a healthy degree of monitoring, self-reflection and critique, their progress and popular acceptance are unlikely, and faster implementation will remain an illusion. Even the type of modest progress seen during the early 2020s, with several reality checks but also successes (see, for instance, Siddi, 2023, pp. 44–79), will remain endangered unless justice becomes an integral part of transition politics. This is possible because actors retain the ability to choose, and with that comes also responsibility. Further scholarly work on resilience and justice issues will be necessary to properly serve those responsibilities.

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Conflict of Interests

The authors declare no conflict of interests.

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