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Paradoxes of Norway's energy transition: controversies and justice

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ABSTRACT

Norway exemplifies a number of paradoxes in relation to the just transition from fossil fuels to renewable energy provision. We investigate these paradoxes by focusing on key controversies from the oil and gas sector and onshore wind power. Despite the widespread interest in avoiding conflict and increasing public acceptance, this article sees controversies as useful sites for uncovering justice issues in possible transition pathways. The controversies reveal competing interpretations of just transition amidst an inadequate cross-cutting policy response. Conventional solutions for restructuring petro-maritime industries involve taking controversies out of sight from the public and internalizing the issue of just transition to the sector's needs. This achieves only shallow engagement with broader society regarding the scope of societal transition needed to meet climate policies. Controversies around onshore wind installations are on the doorsteps of communities themselves and call attention to the difficult social aspects of transition that require a much broader public debate and policy response. We conclude that just transition should not be interpreted sectorally in competing energy futures but rather should infiltrate both the fossil and renewables sides of the Norwegian energy provision paradox.

Key policy insights

- Policies must take stock of controversies and acknowledge and unravel them to understand justice issues rather than seek to minimize them for political expedience.
- Just transition policies should not be limited to directly affected sectors and locations to minimize controversies but should reach broader aspects of society to enable the deepest scope of transition (from the industrial sector to community and society).
- Just development of renewable energy in Norway requires consideration of procedural, distributional, recognition and restorative aspects of energy development.
- Energy policy targets need to be both long-term and inclusive.
- More attention is needed to the oil and gas supply-side and energy demand reduction to connect the energy transition with ambitious climate policies.

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1. Introduction

Norway is a paradoxical case in discussions about climate and energy transitions (Hanson et al., 2011). On the one hand, the country is positioned as a global leader on social, economic, and environmental grounds, e.g. through a push for decisive international climate action such as rainforest protection (Eckersley, 2016;

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Hermansen & Kasa, 2014) and other forms of international cooperation. The country is powered by a nearly 100% renewable energy system (e.g. Rosendal et al., 2019), and its policies have yielded one of the largest fleets of electric vehicles globally (Skjølsvold & Ryghaug, 2020). On the other hand, much of the nation's welfare is based on oil and gas (O&G) extraction and exports and revenues from lucrative industries associated with O&G. While many actors see the resources and competence in these industries as significant assets for achieving transitions (Hansen & Steen, 2015), O&G dependent regions are arguably 'locked-in' to high carbon pathways of development (Narula, 2002), meaning that it is in practice difficult to mobilize these resources for means beyond O&G activities to realize transition goals for other sectors.

In this article, we combine a focus on paradoxes with perspectives from literature on just transitions and energy justice. Paradoxes are understood to be disconnects of logic, inherent contradictions and oppositions, and they help to understand the complexity of existing tensions (see, e.g. Bednarek et al., 2021). Perspectives on justice shed light on how the burdens and benefits of transitions are distributed, the processes through which transitions are enacted, and whose voices are recognized as legitimate in such processes (e.g. Jenkins et al., 2016). Empirically, we probe a set of emblematic controversies that shape and are shaped by competing visions of Norwegian energy futures. Given these paradoxes in Norway's energy system and the potential impacts of transition on the well-funded welfare state, the concept of a just transition and what it could mean for Norway deserves specific attention because any transition in this context will represent a significant shift in power and resources. Our study of emblematic controversies allows us to distil a set of policy implications for just transitions emerging from different visions of Norwegian energy futures.

Specifically, we expose controversies both in the petroleum sector surrounding new O&G exploration and development; and in the renewable energy sector surrounding onshore wind power deployment, and we elaborate on meanings of justice in the related transition debates. With urgent global attention being placed on the transformation of energy systems to meet climate goals (IEA, 2021), the case of Norway, based on its contradictions as an affluent, oil-dependent country with high sustainability ambitions, stands to make a valuable contribution to the debates surrounding just transitions. Before we elaborate on the concepts underpinning our work, we will briefly dive into some details of the paradoxes of the Norwegian energy and climate transition.

1.1. The Norwegian energy/climate transition paradox

Norway's official climate ambition is to become a low-emission society by 2050 and to reduce emissions by 90–95% compared to 1990 levels by that year (Regjeringen, 2021a). In terms of renewable energy, Norway has a high share of production due to past-developed hydropower capacities (e.g. Rosendal et al., 2019) and more recently developed wind power resources (e.g. Vasstrøm & Lysgård, 2021). As a result, the country provides clean and renewable electricity for domestic use and export (Hansen, 2013). The future Norwegian energy system tends to be associated with, e.g. modernity, hopefulness, and openness (Ballo, 2015; Skjølsvold, 2014), but it also faces the challenge of transforming a deeply entrenched 'comfort culture' characterized by high energy consumption (Aune, 2007; Aune et al., 2011; Korsnes & Throndsen, 2021).

At the same time, Norway is a prominent exporter of O&G, supplying 3% of global gas consumption and 2.3% of global oil production in 2020 (IEA, 2022). Much of the country's welfare is based on government O&G revenues (Heide et al., 2006). Economic prosperity and identity have been associated with O&G since the end of the 1960s (see Engen, 2009; Tamnes, 1997), but the industry is also increasingly linked to economic and climatic risks (Bang & Lahn, 2020). The same O&G industry has been described as 'stranded' and economically risky (Mercure et al., 2018). Despite the state's ambitions that imply a need for drastic change, the O&G sector seeks decarbonization rather than phase-out (Afewerki & Karlsen, 2021), which can be seen as a half-measure of carbon reduction through abatement technologies rather than reduced O&G production. Indeed, few policies or active interventions have targeted O&G supply cuts (Le Billon & Kristoffersen, 2020; Piggot et al., 2020), and research has illustrated how difficult it is to transform the activities of such a profitable industry (e.g. Mäkitie et al., 2018). On the other hand, while the country seeks to become a supplier of green energy to Europe within the framework of the European Green Deal (Regjeringen, 2021b), Russia's war in Ukraine has sparked cooperation between Norway and the EU and the expansion of O&G development

beyond 2030 (Regjeringen, 2022a). Thus, the state foresees a significant role for O&G into the distant future, but also a shift to 'green industries' as a source of national competitiveness and prosperity, which may feed back to and strengthen O&G sectoral interests, thus potentially delaying the transition.

2. Just transition, paradoxes, and controversies

Just transition has become a central theme in discussions about energy transitions in recent years, addressing topics from energy security, market uptake and socio-economic (e.g. labour and income) disparities on the community level (e.g. Hoicka et al., 2022; Jenkins et al., 2016) to widespread social, political and economic restructuring on national and global levels (e.g. Newell & Mulvaney, 2013). Critical foundations of the just transitions literature direct attention to 'questions of 'who wins, who loses, how and why' as they relate to the existing distribution of energy, who lives with the side effects of its sites of extraction, production and generation, and who will bear the social costs of decarbonizing energy sources and economies' (Newell & Mulvaney, 2013, p. 133). Academics have distinguished between types of energy justice (e.g. distributional, recognition and procedural (Jenkins et al., 2016) as well as cosmopolitanism and restorative (Hazrati & Heffron, 2021; Heffron & McCauley, 2017)), often emphasizing the role of power and thereby predisposing the study of just energy transitions to the most disadvantaged communities and sites of exploitation. With policy mainstreaming, just transition has become normalized in the sustainable development goals (SDGs) (UN, 2021; Vasconcellos Oliveira, 2018) and in EU policies which tend to identify just transition with carbon-intensive, degraded and less developed regions (European Commission, 2020). As a result, the contribution from relatively affluent and egalitarian countries such as Norway is lacking in understandings of just transition. In this context, enriching understandings can be a messy task that calls for an interdisciplinary, social science approach to study the confrontation between competing perceptions of energy transitions and the social groups affected. Thus, the paradox concept showcases a dualism in the O&G and renewable energy aspects of the Norwegian energy transition, which is investigated through controversies that exemplify competing ideas about just transition.

2.1. Paradoxes of justice in sustainability transitions

The concept of paradoxes has been broadly used in descriptions of sustainable development for several decades, reaching back to the problematic ambiguity associated with sustainability itself (Marcuse, 1998). As such, sustainability-oriented change is fraught with hidden articulations that reveal paradoxes when put into practice through, e.g. technological fixes and new societal needs (Mulder et al., 2017). Prime paradoxes of sustainable development include the potential for efficiency-enhancing technologies to boost consumption and resource use, and to trigger shifts in production to less regulated domains (Mulder et al., 2017). Moreover, extensive literature has developed on paradoxes in organizational theory (see Bednarek et al., 2021), and a paradox perspective has been articulated within corporate sustainability and management (e.g. Hahn et al., 2018; Van der Byl et al., 2020) to acknowledge tensions between business aims and sustainability.

Paradoxes identified in the energy transition, more specifically, include the need for renewable energy to co-exist with fossil energy to grow its market share (Belazquez, Fuentes-Bracamontes, Bollino, & Nezamuddin, 2018). Other disconnects of logic and contradictions in the energy transition include, e.g. the international promotion of low-carbon technologies and reluctance to implement them locally; between existing incentive schemes (e.g. climate/carbon credits) and actual investment in renewable energy; or between the financial interests of stakeholders regarding the proceeds of renewable energy production and the neglected societal goal of energy justice (Brunet et al., 2021; Lennon et al., 2019). Research points to the need to intervene in the energy transition, which is also described as a leadership paradox towards collective action (Kowalski, 2013). This has been addressed through research on the market uptake of renewable energy (e.g. Hoicka et al. (2022) on just transition in renewable energy communities), on social acceptance across the spectrum of stakeholders (Devine-Wright et al., 2017; Sovacool et al., 2022), and on ensuring a just transition that reduces rather than increases socio-economic disparities (Jenkins et al., 2016). While the former two are more related to market operations, which are well addressed in the literature, the paradoxes of just transition have been less explored. In this direction, paradoxes may be addressed by social dilemma theory, which

highlights schisms in rational thought processes that result in conflicts between individual and community interests (Voogd, 2001). Here, we draw a connection between the concept of paradoxes and the inherency of controversies in their social construction and mutual understanding.

As a common thread in sustainability transitions, industrial society is increasingly viewed as the expression of a paradox leading to the climate crisis, demanding deep societal changes (e.g. Schot & Kanger, 2018). The neo-liberal framework of contemporary capitalism hinders institutional (e.g. state) capacities and autonomy to ensure just transitions (Newell & Mulvaney, 2013), which emphasizes the challenge of tackling systemic contradictions through conventional policy means. More research is needed to understand the varieties of capitalism at play for sustainability transitions concerning multiple stakeholders and power relations (Loewen, 2022a) and to confront regional energy transitions as a development concept (Loewen, 2022b), relating to issues of justice. Lessons from recent international crises have shown that paradoxes cannot be solved, but political and technological fixes shift the effects from one domain to another (Gough, 2004; on Harvey, 1982), creating localized implications for just transitions in communities. As such, the paradox concept is helpful in considering the complexity and intricacies of transition, such as social, political, and economic tensions in the whole energy system transformation. More generally, sustainability involves addressing ethical questions about how Earth's resources should be shared (Wals & Jickling, 2002), so paradoxes within contemporary capitalism also call attention to understandings of sustainability as an organizing framework, turning the focus back to controversies and justice.

2.2. *Controversies and just transition*

In contrast to the more abstract concept of paradoxes, controversies are taken as the more concrete representations of paradoxical dualism, that is, as competing logics guiding the organization of society battle in the court of public opinion. Controversies are informative in the political economy of transitions since 'what is just, and for whom, will be determined by power struggles in particular contexts' (Newell & Mulvaney, 2013, p. 138). Controversies are opened through transition initiatives that shape narratives of national energy systems and draw out the most affected actors. Since they relate to vested interests in, and mutual dependence on, fossil fuels, controversies around regional transitions (community level) are the most complex to implement successfully, as they may require a shift in cultural norms or worldviews to build acceptance (Green & Gambhir, 2020). Thus, to trace the paradox of just transition in Norway, we turn to the role of controversies arising through the manifestation of energy as a lifeblood of the Norwegian economy.

Previous work on Norway's energy transition challenges has covered several elements of controversy and paradox, which this article builds on (see Aune & Sørensen, 2007; Hanson et al., 2011). More recent energy controversies have been studied in Norway from psychology acceptance (e.g. Klæboe & Sundfør, 2016) and political-administrative and managerial (e.g. Gulbrandsen et al., 2021; Inderberg et al., 2019; Saglie et al., 2020) perspectives, particularly regarding wind power siting and licensing, which has highlighted justice in terms of 'fairness'. While this is important for understanding practical project implementation and acceptance of energy transitions, such research has neither focused on the value of controversies nor reflected the depth of paradoxical dualism in Norway's energy provision. Hence, there is a need to synthesize and go beyond the existing research to widen the perspective on controversies to address various notions of just transition in Norway, covering the range of stakeholder groups affected.

To understand just transition in terms of which social groups bear the costs of transition in competing visions of the future energy system (e.g. Muttitt & Kartha, 2020), prior studies in Norway have pointed out key actors for transition in need of protection from both fossil and renewable energy development (e.g. Anker, 2018; Normann, 2021). Past research has indicated a connection between O&G employment and opposition to transition activities (e.g. Tvinnereim & Ivarsflaten, 2016) as well as a movement of energy elites from fossil to renewable energy and sustainability-oriented industries (Rauter, 2022). This feeds into broader debates about how notions of just transitions are of particular importance in carbon-intensive regions (e.g. Afewerki & Karlsen, 2021; Swennenhuis et al., 2020), and how meanings of justice become part of the transition debate.

Controversies and disagreements are not only barriers to change, but necessary negotiation processes to achieve just sustainability transitions. Wong and van der Heijden (2019), for example, found that conflict

avoidance hindered the negotiations needed to get the Sustainable Development Goals implemented across ministries and departments in Germany, Finland, and the Czech Republic. This recognition implies that ‘transition must be seen as a heterogeneous process replete with (potential for) controversy and contention’ (Rutherford, 2014, p. 1465). In this sense, controversies around both the development of renewable energy and decreasing dependencies on fossil fuels in Norway point towards an ongoing discussion around the way in which Norway’s energy transition is experienced as just or unjust. Thus, we subsequently analyze and present issues of contention in the onshore wind and O&G sectors and relate these to the discussion of just transition.

3. Methods and approach

This study draws on a tracing of energy transition controversies conducted by an interdisciplinary team within the Norwegian Research Centre for Energy Transition Strategies (FME NTRANS), covering science and technology studies, social anthropology, planning, political economy, and economic geography. A central aim of perspectives within the broad category of ‘transitions research’ is to ‘conceptualize and explain how radical changes can occur in the way societal functions are fulfilled’ (Köhler et al., 2019, p.2), while acknowledging the need for ‘humanized’ research attentive to questions of ethics and justice including structural power differences, energy access, gender, and diversity (Jenkins et al., 2018; Søråa et al., 2020). Interdisciplinary approaches have also been promoted for paradox scholarship (Bednarek et al., 2021) with the aim of enriching insights on societal challenges which can include sustainability transitions.

Using our interdisciplinary approach, we attend to specific controversies from the O&G and onshore wind power sectors in Norway to get an in-depth understanding of how these have arisen and explore their implications for just transition. The analysis draws collectively on the authors’ empirical material prepared as a contribution to an international comparative study mapping social opposition to energy infrastructure, covering cases related to high-voltage electricity cables, wind power projects, and O&G fields (Sovacool et al., 2022). The mapping included a historical description of the controversies surrounding significant infrastructure cases in Norway with a particular presence in the Norwegian public since 2010. Data was collected using web searches, online media archive (Retriever), research literature, and official licensing records through the Norwegian Water Resources and Energy Directorate (NVE) documenting the whole history of the energy infrastructure project, including initial proposal and public hearing responses following project developments. When describing each case, we particularly sought information on the following four variables: 1) an overview of the involved actors, including proponents and opponents; 2) the tactics used by the stakeholders, e.g. hearings, protests, rallies, or litigations; 3) the (preliminary) outcomes of the controversy, such as delays in projects, compensations, or project termination; and 4) the duration of the cases (see also Appendix 1 for our coding template). After the cases were described in depth (see overview of cases in Table 1), we compared the key cases on onshore wind and O&G according to the four variables and analyzed the similarities and differences which led to the results presented in Section 4. The study also draws on some of the authors’ long-standing empirical work in the areas of oil and gas and wind energy (see Dale, 2018, 2019; Hansen & Steen, 2015; Steen & Hansen, 2018).

Table 1. Cases and types of energy infrastructure mapped.

Case name	Region of intervention	Type of infrastructure
Haramsøya*	Møre og Romsdal	Wind power
Roan	Trøndelag	Wind power
Frøya*	Trøndelag	Wind power
Storheia*	Trøndelag	Wind power
Fålesrásša	Troms og Finnmark	Wind power
Davvi	Troms og Finnmark	Wind power
Goliat*	Troms og Finnmark	Oil field
Johan Castberg*	Troms og Finnmark	Oil field
Snøhvit*	Troms og Finnmark	Gas field
Balsfjord-Skaidi	Troms og Finnmark	420 kV Power line
Hardanger Power Line	Vestland	420 kV Power line

* Cases selected for current analysis

The paper proceeds by focusing on emblematic controversies representing O&G and onshore wind power, specifically, considering how these relate to the direction of the Norwegian energy transition and policies for just transition.

The purpose of the current analysis is to get a better grasp of the way in which these controversies relate to the overarching direction of the Norwegian energy transition that shapes and feeds into current energy transition policies. We exploit the mapped controversies around the sites of Snøhvit, Goliat, and Johan Castberg, in the cases of O&G, and Frøya, Haramsøya, and Storheia, in the cases of onshore wind power (Figure 1; Tables 2 and 3). For both O&G and wind power, these represent recent additions to production over several decades of O&G development and a century of wind power development in Norway.

4. Norwegian controversies in energy transitions

4.1. Oil and gas in transition

4.1.1. Historical development of O&G sector

Norway's experience with O&G extraction started in the 1960s when there was little confidence that there would be any oil on the Norwegian continental shelf (NCS)—and if there were, it would be too expensive to extract. As oil was discovered, three central tenets were developed for extraction on the NCS, inspired by the experience from hydropower in the early 1900s with a cautious approach to foreign ownership of natural resources: (1) Operational responsibility divided between a ministry, a directorate, and a state-owned oil company Statoil (now Equinor); (2) a licensing system where joint ventures were central; and (3) a tax system capturing large parts of profits that later (in 1990) was funnelled into a revenue fund to build wealth for future generations (see Bang & Lahn, 2020). As Statoil learned the basics of the industry, and Norway gained more experience, a wave of liberalization policies made Norway's petroleum endeavours more outward-seeking and profit-oriented, and not only focused on domestic welfare (Ryggvik, 2009).

Today, the petroleum industry is Norway's largest and most profitable, employing more than 158,000 people in 2019 (SSB, 2021). Lobby organizations such as the Norwegian Oil and Gas Association tend to estimate higher numbers, claiming there are 205,000 employees in the sector in 2019 and thus tying more importance to the sector for Norway's employment and income. From a transitions perspective, it is worth noting that whilst 68,000 of the workers are directly employed by O&G firms (SSB, 2021), the remainder (and majority) are employed in various service-related industries ranging from exploration to hotel and catering services. This historical backdrop illustrates that a transition involving either the phase-out or transformation of O&G will have bearings on justice issues, producing new winners and losers, depending on how dominant socio-technical configurations end up looking.

4.1.2. Key controversy: Barents Sea south east exploration and development

At the turn of the twenty-first Century, Arctic oil was seen as the next big potential for the global O&G industry. The Norwegian Petroleum Directorate predicted that most of the undiscovered resources on the Norwegian continental shelf were in these waters. Current estimates continue to hold that more than 60% of the undiscovered resources on the NCS are in the Barents Sea (Petroleum Directorate, 2020). Nevertheless, development has been slow. The industry was downscaling its activities in Arctic regions already in 2011 (Kristoffersen, 2014), as the cost levels in the Barents Sea were not perceived to be competitive. To date, only two projects have been realized: Snøhvit, operated by Equinor, and Goliat, operated by Vår Energy (formerly Eni Norge). For the host municipality of Hammerfest in West Finnmark, O&G has become a new cornerstone of the economy since

Table 2. Characteristics of selected O&G sites.

	Year of discovery	Year of first production	Recoverable reserves
Snøhvit	1984	2007	251 million Sm ³ o.e. gas and natural gas liquids
Goliat	2000	2016	31.4 million Sm ³ o.e. oil
Johan Castberg	2011	2024	88.9 million Sm ³ o.e. oil

Data: <https://www.norskpetroleum.no/en/facts/field/>

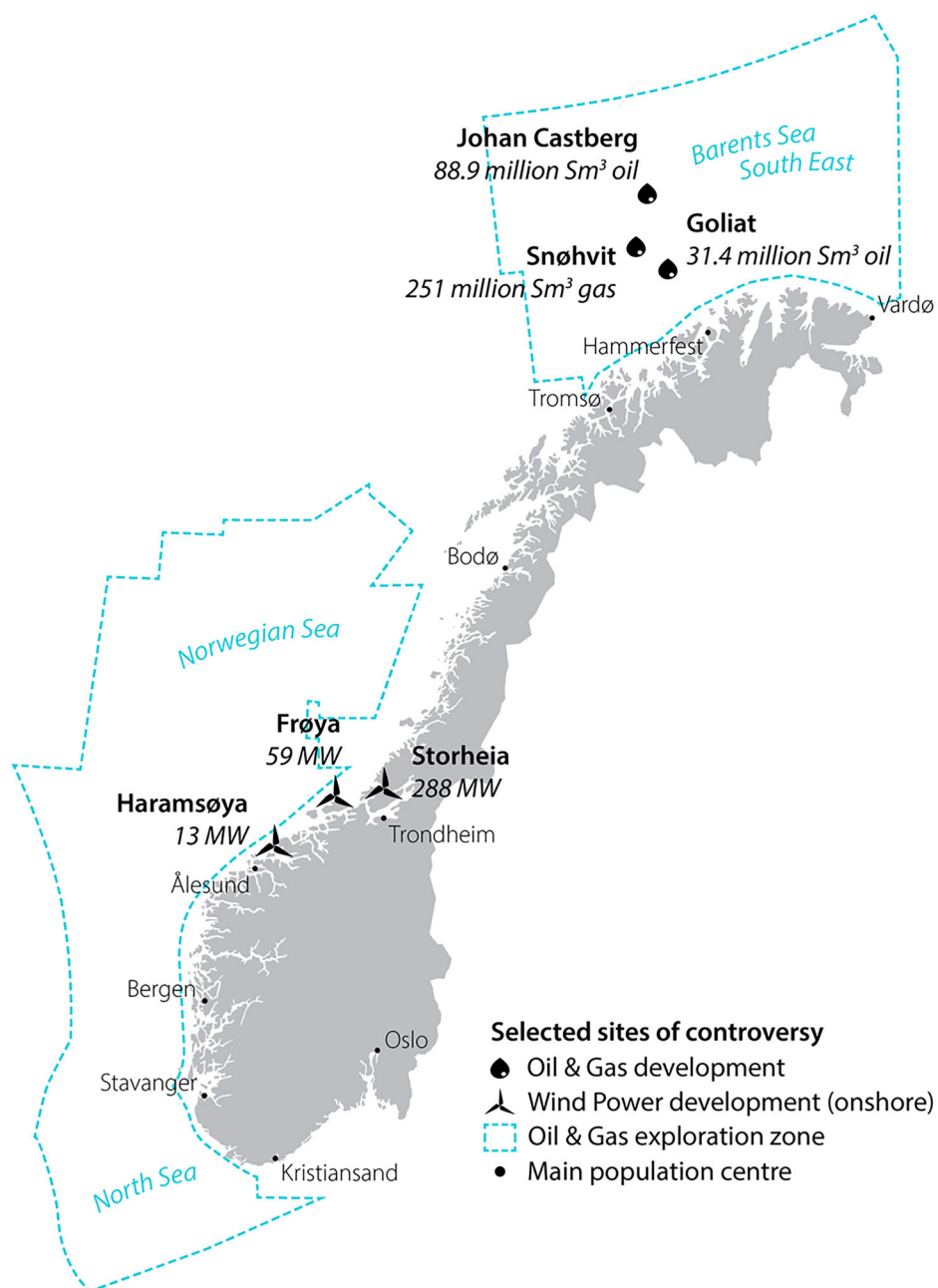


Figure 1. Selected sites of controversy in the Norwegian O&G and onshore wind power sectors.

Table 3. Characteristics of selected onshore wind power sites.

	Year of first production	Number of turbines	Installed capacity	Average annual generation
Frøya	2020	14	58.8 MW	197 GWh
Haramsøya	2021	8	33.6 MW	127 GWh
Storheia	2019	80	288 MW	973 GWh

Data: <https://www.nve.no/energi/energisystem/vindkraft/vindkraftdata/>

the early 2000s (Holm et al., 2013). Hammerfest gains direct income in the form of property tax from Snøhvit, as the project is an onshore LNG facility (Dale, 2018). In addition, jobs, and other ripple effects to the region have led to high levels of social acceptance for the project (Loe & Kelman, 2016).

Finnmark is also part of the homeland of the indigenous Sámi. However, matters of Sámi rights regarding O&G have largely been backgrounded or remained marginal in impact assessments, even when such development has onshore impacts (Dale & Dannevig, 2023; Henriksen & Hernes, 2011). Controversies have centred more around concerns for a vulnerable Arctic and Norway's responsibility for global climate targets, a critique often levelled by national NGOs and political opposition parties (Thygesen & Leknes, 2010). The decline of fisheries and several structural changes to the fishing fleet since the 1970s have led to the industry having a weaker position, and many of the fishing vessels have been enrolled in the oil spill response programme for the Barents Sea. Local and regional concerns have thus centred around the economy and reversing population decline. The local controversies in the cases of Goliat and Castberg have been about securing local content for coastal municipalities in the form of local jobs and value creation, particularly as activity for the supply industry. Coastal municipalities initially demanded onshore terminals for both Goliat and Castberg to bring jobs into other municipalities than Hammerfest, but the government approved both platforms as fully offshore projects (Dale, 2019).

In comparison, proposed plans for O&G exploration have been met with sustained and organized resistance from fishers, residents, and NGOs in the Lofoten, Vesterålen and Senja (LoVeSe) archipelago groups, which are important regions for cod fishing in the winter months. With a different economic situation than in Finnmark, residents in LoVeSe have been more concerned with the long-term implications of petroleum activities, and regional identity tied to fishing rather than O&G (Kristoffersen & Dale, 2014).

The controversy around opening new exploration licences in the Barents Sea South East (BSSE) in 2016 also reflect concerns for long-term implications. The then Minister of Petroleum and Energy, Tord Lien, declared 'a new chapter in the history of the Norwegian Petroleum industry' during a ceremony in Hammerfest (Norway-today.info, 2016). The coastal municipalities and industry in Finnmark welcomed these new licences. However, they became subject to a lawsuit by the Norwegian environmental movement, claiming that opening new areas for exploration and production breached the Norwegian Constitution and the right to a viable environment. The plaintiffs lost in the Supreme Court in 2020 (Supreme Court, 2020) but have taken the complaint to the European Court of Human Rights.

The future of O&G in the Barents Sea remains uncertain for economic rather than environmental reasons: No economically viable discoveries have been made in the BSSE, and further west off the coast of Finnmark the resources are far from land in challenging conditions. Equinor was due to submit a Plan for Development and Operation of the Wisting field 340 km north of Hammerfest to develop the field with favourable tax conditions created to stimulate activity in the O&G sector through the pandemic. Yet, in November 2022, shortly after political signals that conditions of the tax package would become less favourable for companies, development of the Wisting field was postponed until 2026 (Equinor.com, 2022), making the supply industry in Hammerfest uncertain about the future.

4.1.3. Implications for just transition

Norway's dependency on the petroleum sector signifies vulnerability towards transition. In the years following the 2014 drop in oil prices, more than 70,000 jobs directly and indirectly related to O&G disappeared, with the largest decrease happening in 2013–15 (Brasch et al., 2018; Hungnes et al., 2016). This decline shows the sector's volatility in responding to insecurity and sudden shifts in profitability. Whether a transition is planned with a gradual phase-out strategy or a strategy to continue for as long as possible, O&G-related jobs will be fewer and less secure in the future. Nevertheless, O&G was the industry benefiting most from government subsidies during the COVID-19 pandemic. While Norway has been a frontrunner in low-carbon recovery spending, it has also continued the 'business as usual' of fossil infrastructure spending and tax breaks (Hans et al., 2022; O'Callaghan & Murdock, 2021), extending the economic viability of projects that may otherwise not have been developed. A long-term effect of the pandemic policy response may thus be that Norway's economic dependence (and vulnerability) on the O&G sector is prolonged.

A more planned transition could secure the build-up of new jobs whilst gradually reducing dependency on O&G. Attempts to demonstrate this have been advocated by, amongst others, the 'Bridge to the Future' alliance (*Broen til framtiden*) (Ytterstad, 2015) – a coalition between a handful of Norwegian labour union organizations, environmental NGOs, and the Norwegian church. A report commissioned by this alliance found that a transition that actively creates jobs whilst phasing out O&G is possible, at a cost that would be feasible with a portion of the state's financial reserves of between 97 billion or 59 billion NOK per year (approx. 9.8 and 6 billion USD with November 2022 currencies), in a 'full stop' or 'no new fields'-strategy, respectively (Gran et al., 2017). Adding to this, a recent report estimated that the macroeconomic effects of downscaling O&G by not issuing new licenses and combining that with tax changes, would be 'quite moderate' (Aune et al., 2020). Suggestions of a gradual phase-out have been received as utopian and too expensive. The continued heated debates over petroleum within the labour movement, particularly in the Norwegian Confederation of Trade Unions (LO-Norway), reveals a domination of the O&G industry (Houeland et al., 2021). Despite the critical role of labour unions, changing opinions and internal conflicts remain relevant concerning strategies for a just transition (Houeland et al., 2021; Normann & Tellmann, 2021).

As we will return to in Section 5, the paradoxes of Norway's energy transition are deepened by the fact that much competence and personnel from the Norwegian petroleum sector is in principle transferable to the renewable energy sector including offshore wind (see e.g. Steen & Hansen, 2018). Capabilities and assets from offshore O&G could (partly) support new green industries, potentially thus avoiding massive job loss, especially in regions highly dependent on petroleum labour. On the one hand, developments in this direction gained traction in February 2022, when Norway launched tenders for offshore wind development on the NCS (Regjeringen, 2022b). On the other hand, oil price fluctuations and crises of energy security in Europe in 2022 have suggested increases in O&G production in the near term, which points to the enduring instability and uncertainty around any temporary settlements of just transition.

4.2. Onshore wind controversy

4.2.1. Historical development of wind power sector

Norway's first wind turbine producing electricity was installed in the northern Lofoten archipelago in 1916, while the first modern-day wind turbine was erected in mid-Norway for research purposes in 1986 (Bye & Solli, 2007). After that, several singular turbines were set up, and in 1991 the first wind farm with five turbines was installed. The development of Norwegian wind farms strongly accelerated from around 2017 (Figure 2). From 2017 to 2020, a total of 2800 megawatt (MW) of new capacity was added, equivalent to almost half of Denmark's total installed capacity in 2020—a long-standing leader in wind development. An upsurge of popular resistance accompanied this dramatic growth in installed capacity.

Norway's experience with wind power has been systematically compared with its experience with hydro power (Bye & Solli, 2007), building on similar points of controversy. For instance, in the 1970s and 1980s, there was significant resistance against developing more hydropower because of the destruction of nature and classical issues of distributional justice where the indigenous Sami people stood to lose from the developments. Such concerns have been echoed in the wind controversy as well. During the 1990s, the Norwegian discourse on wind power was dominated by increasing interest and support, but the environmental sustainability of wind power was also questioned (Bye & Solli, 2007). The main critique was that wind energy appeared to be too expensive compared to hydropower (Solli, 2007). The resistance to wind power increased during the early 2000s, and concerns for destroying untouched and pristine nature were central. Protests increased as concessions were given to larger wind farms in the early 2000s. Typical arguments against wind energy development were visual concerns, noise, use of land, and the health of wild birds and animals (Rygg, 2012). Arguments for wind power were economic development, modernization, and local job creation. Nevertheless, the protests were never large enough to stop or change the development of more wind farms (Bye & Solli, 2007). Instead, lacking profitability was the main reason why the Norwegian wind power development, to a large extent, was on a hiatus until around 2017-18.

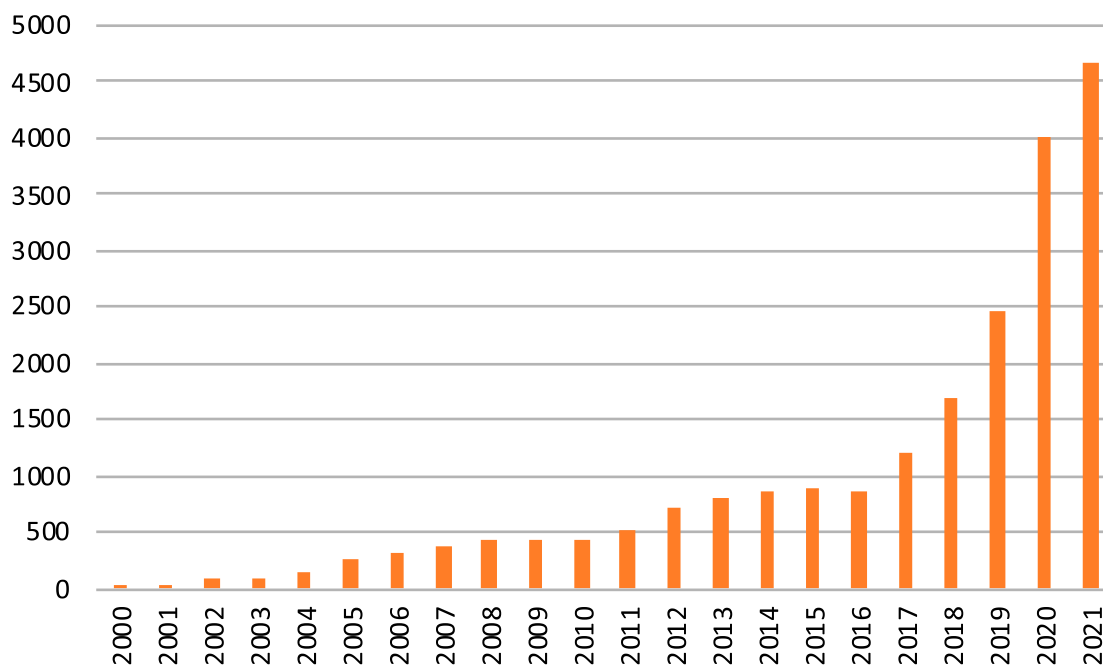


Figure 2. Installed wind capacity in Norway 2000–21, in MW. Source: NVE (2022).

4.2.2. Key controversy: onshore wind power

Several interrelated factors explain the increased resistance against wind power development around 2017–18 as installations surged. One simple reason was larger and more visible turbines: In the time between licenses being awarded—some places up to 10–15 years earlier—and projects entering the construction phase, developers had applied and received permission to install larger turbines, based on the existing licenses. The more visible turbines were not popular in local communities close to wind farms. Another reason was the proposed national framework for wind power ('*Nasjonal Ramme for Vindkraft*'), which the Ministry of Petroleum and Energy commissioned in February 2017. The framework laid out the areas most suited for onshore wind energy, based on an assessment of 'wind resource, grid capacity, and attuned to environmental and societal interests' (NVE, 2019, authors' translation). Although the framework represented massive coordination of knowledge and experience within and between the Norwegian Water Resources and Energy Directorate (NVE), the Norwegian Environment Agency, and the Directorate for Cultural Heritage, it was interpreted by the public as a plan for development that did not capture local societal interest thoroughly enough, and therefore met with massive resistance. Ultimately, the government decided not to follow its recommendations.

Three prominent wind power projects were at Frøya, Haramsøya (both islands) and Storheia. The wind park plans at Frøya started in 2002 and culminated in 2019 when wind turbines were erected on the island against the will of a large portion of the local population. A referendum in 2005 showed that a 51.4% majority accepted the wind project, indicating that the local population was divided on the issue (Frøya Municipality, 2022). By the time the project was implemented, it was reduced in size from 200 MW and 63 turbines to 59 MW and 14 turbines. The resistance experienced at Frøya led to the creation of the organization 'Motvind' in 2019 that organized protesters against onshore wind energy in Norway. Motvind succeeded in stopping NVE approvals of all new onshore wind projects (although in April 2022, approvals recommenced). The resistance was also large at Haramsøya, where initial plans for a wind project started about 15 years before construction. The initial project application had an installed capacity of 66 MW and 33 turbines but following a lengthy negotiation process only eight 4.2 MW turbines were installed (in 2021). The local municipality and regional governments opposed the project, but the Ministry of Petroleum and Energy gave final approval in March 2020. Storheia is Norway's largest wind farm with an installed capacity of 288 MW. The first application for a project came

in 2006, and the wind farm was installed in 2019. Since the beginning, the indigenous Sámi people in the area were against the wind farm, which impacted reindeer winter grazing areas. In October 2021, the Supreme Court sided with the reindeer herders and ruled against the license, as the wind turbines violated Sámi herders' right to practice their culture (Supreme Court, 2021). What will happen to the wind farm is unclear, but the current government has stated that they want to keep both the wind park and reindeer herding in the area (tu.no, 2022).

4.2.3. Implications for just transition

In the wake of the increased controversy around wind power, there has been a surge of popular literature and social science research (e.g. Inderberg et al., 2019, 2020; Saglie et al., 2020; Totland, 2021), much of which focuses on siting and licensing processes and related decision-making. Some of this research provides new perspectives on the role of Sámi groups in decision-making processes (e.g. Fredriksen, 2022), pointing out that the process has been characterized by a 'renewal of historical processes of dispossession through accumulation and colonialism' (Normann, 2021, p. 77). A recent study examining the licensing practices finds that there has been an institutional push towards increased wind power development, lacking clear signals about how nature protection concerns should be weighed (Gulbrandsen et al., 2021). As these different examples show, the controversies address energy justice directly and non-energy specific procedural and distributive justice relevant to local communities at large. As experienced with the contested effects of wind power development on Sámi groups and the decision of the Supreme Court, there is also potential for restorative justice concerning the future treatment of these groups and protections for indigenous land rights in general. Nevertheless, there is still much room for improvement concerning procedural justice, as the Supreme Court ruling came only after the wind park had been built.

5. Insights on just transition from the controversies

A key insight of the controversies discussed is Norway's continued vulnerability towards transition due to dependency on the petroleum sector and the doubt this vulnerability casts on possibilities for a just transition. Typical patterns of contractions and expansions in the global O&G sector are unfolding in Norway in the aftermath of the COVID-19 crisis and Russian invasion of Ukraine, suggesting that current economic profitability may be more indicative of any 'planned' O&G phase-out than ambitious sustainability targets, although the two can be normatively intertwined in policy discourses (cf. Regjeringen, 2021a and 2022a). As prior research has shown, although some regions are more dependent on the O&G sector than others, repercussions from a phase-out will be felt throughout the country (Karlsen, 2022). Nevertheless, the academically-presumed phase-out of O&G as a necessity to achieve climate goals is not reflected in the policy response, which highlights decarbonization of O&G supplies and expansion of renewables (Regjeringen, 2021a,b; 2022a,b). Controversies have been instrumental in bringing multiple aspects of just transition to the fore of public concerns in Norway, albeit differently in the O&G versus onshore wind developments.

Across the two cases, we find competing concerns that reflect different aspects of just transition, based on the sectors and actors dominating in public debates. Actors more economically oriented appeal to employment and local livelihoods, while others more socially sensitive appeal to landscape preservation and cultural identity. The perspective dominated by the O&G sector addresses just transition in terms of the country's economic future, e.g. industrial and national competitive advantage and employment, by developing renewable energy industries through innovation and re-training. The perspective shown in the onshore wind controversy reveals concern for wider social interests, albeit shaped by local factors like identity, landscape heritage, and environmental preservation. This can be criticized as 'NIMBYism' (not-in-my-back-yard-ism) regarding who should bear the burden of sustainable development. However, arguments used by those against wind energy are not necessarily against sustainability as such; some publicly argue that we can make do with less energy, thus envisioning an altogether different energy future. Identity is also important in the O&G sector, particularly in terms of its significance for jobs and industry in its regions of operation. In reconciling competing and missing voices in the controversies, the notions of just transition that come to be promoted in policy should be interpreted critically.

The exposed energy-related controversies thus reinforce a lack of epistemic justice (see Pandey & Sharma, 2021) in setting policy priorities for the energy transition, between economic, social, and environmental dimensions. A now commonly held position remains that increased wind power production is needed as part of the renewables mix to meet climate objectives, and that it is expected to serve as a useful resource in an integrated European energy market – i.e. Norway as a ‘green battery’ to Europe (Skar et al., 2018). Regarding social acceptance, the O&G oriented discourse attempts to solve this by putting wind out of sight or offshore – enabling the transfer of skills from one offshore sector to another (Steen & Hansen, 2018) – with minimal disruption to the socio-economic structure of petro-maritime regions. The idea of offshore wind as ‘out of sight, out of mind’ has existed for some time in Norway (Heidenreich, 2016), and finds particular resonance with long-held regional restructuring processes (Afewerki & Karlsen, 2021; Karlsen, 2022), which tend to exclude segments of society beyond the O&G sector. Indeed, offshore wind investments in Norway have been heavily influenced by interest from the O&G industry. At the same time, industry interest has increased with declining oil prices and vice versa (Mäkitie et al., 2019), and also suffered from shifting signals from various governments (Normann, 2015; Steen & Hansen, 2018). This uncertainty has halted industry development and domestic deployment of wind power offshore.

The onshore wind controversy, on the other hand, demands broad engagement to gauge benefits of local projects, which can be achieved through community-based initiatives (e.g. renewable energy communities) (Hoicka, Lowitzsch, Brisbois, Kumar, & Ramirez Camargo, 2021), as well as communities of interest (e.g. the Motvind movement). However, they must also confront deep historical conflicts such as indigenous land rights and practices. There is also a tension between different forms of justice, e.g. the procedures may be followed correctly but result in distributive injustices, particularly where indigenous communities are affected (Dale & Dannevig, 2023).

Political polarization is implicit in both controversies. For O&G, this emerges in the sectoral context involving those directly and indirectly employed who stand to lose economically from potential phase-out. Nevertheless, this is contrasted by the sector’s policy orientation, favouring decarbonization by electrifying offshore installations or using CCS rather than down-scaling production (Afewerki & Karlsen, 2021). Regarding onshore wind power, the political polarization has materialized in divided public opinion on local projects, which has largely proceeded despite substantial opposition. This recalls the need for attention to the social acceptance of renewable energy infrastructure (Batel et al., 2013) and confirms the previously observed link between wind farm opposition and place attachment in local communities (Devine-Wright, 2009). The identified polarization also confirms community level transitions as more complex and challenging to complete (Green & Gambhir, 2020), reminding policymakers that a variety of social groups might not agree with Norway’s overall intended energy transition plan.

Given that tensions continue unresolved in both cases, current national policies for the whole energy system transformation seem inadequate to account for just transition. As argued here, public controversies place issues of justice on the political agenda and reveal the inherent contradictions built into Norway’s energy transition paradox. Researched energy-related controversies in Norway, such as those focusing on wind power siting and licencing (e.g. Gulbrandsen et al., 2021; Inderberg et al., 2019; Saglie et al., 2020), tend to highlight procedural and distributive justice from administrative and managerial perspectives, while recognitive and restorative justice are also represented in cases receiving legal and media attention, such as those affecting Sámi groups. Socially-oriented academic perspectives to just transition that could inform policymaking are still lacking and represent an opportunity for future research.

6. Conclusion: the need for cross-cutting just transition policy

Whereas sustainable development has been integrated with the Nordic social welfare perspective generally (Halonen et al., 2017), with rights to a high-quality environment and social protections being relatively settled in the context of a well-funded petro-state, the details of just transition have not been specifically debated in Norwegian energy policy. The Norwegian welfare state is heavily based on petroleum revenues (Bang & Lahn, 2020), and the country’s oil fund has been referred to as Norway’s most important just transition instrument (Szulecki et al., 2021), with an implication that the country’s economic position will carry it through transition. By highlighting the paradox of sustainable energy transition and the need for a just transition even in

wealthy Norway, we call for deeper attention to the multiple aspects of justice in energy and climate policies and the concept of just transition as a cross-cutting issue for multiple policy domains. In the view of Newell and Mulvaney (2013), policy implications of just transition often focus on the state level, while the actual narratives on just transition as informed by the cases appear to be fragmented and in need of a comprehensive national approach.

Given the paradoxes of Norwegian energy provision, the notion of a just transition cannot be limited to the needs of the O&G industry or, separately, to the needs of specific communities to undertake renewable energy projects, as identified by the cases. Thus, we see a need for cross-cutting just transition policies that address and nurture a variety of energy futures with strategies to address multiple aspects of just transition, e.g. distributive, procedural, recognitive and restorative. Just as sustainable development and the SDGs have become normatively part of energy system planning, just transition needs to become a common theme at all policy levels. Generally, this calls for widened attention to social aspects of transition through community engagement, which, as others have pointed out (e.g. Gulbrandsen et al., 2021; Inderberg et al., 2019; Saglie et al., 2020), ultimately plays out in formal processes of project development. Concretely, avoiding incidents like the Storheia case described here implies catering for participatory political processes that value and recognize local perspectives. However, the potential to address just transition at a higher policymaking level across multiple policy domains has not yet been grasped. To further this, controversies become a means of identifying the most commonly addressed but also neglected aspects of just transition, which can eventually influence policy.

The just transition narratives highlighted from the O&G and wind power sector envision a maintained if not strengthened role of energy in Norway's future development, which is reflected in the state's position (Regjerungen, 2021b, 2022a). Notably, a perspective lacking on both sides identified here is that of energy demand reduction, whether it be related to O&G supply or consumer demand. According to the IEA (2022), 'the [Norwegian] government should plan for a scenario in which oil demand falls faster than expected as a result of many countries having net zero by 2050 targets' (p. 13). Furthermore, directing attention to what is missing in the debates opens up potential for other missing or relatively quieter contributions to the public controversies, such as environmental groups motivated by climate science rather than potential 'NIMBYism' in local (e.g. onshore wind) projects. Thus, we draw attention to a need for wider societal engagement to realize the potential of public controversies to produce more just, long-term policy responses for society as a whole.

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Appendix 1: Coding Template

Name:

Summary (fill summary towards the end)

What is the energy infrastructure?

- Transmission power lines
- Renewables (including wind, solar, and hydro)
- Pipelines (including accidents)
- Coal mines (including accidents)
- Oil and gas wells, oil and gas waste (including accidents)
- Nuclear power plants

Did an event (a mobilization of a community, or communities, or an initiative, or a campaign) occur?

- Yes
- No (if no, case does not qualify)

Qualitatively list all actors, including coalitions and multiple actors, involved

Actors or coalitions in support:

Actors or coalitions in opposition or protest:

Tactics

- Meetings and consultations (includes participation in regulatory hearings)
- Litigation (includes defense against litigation by incumbents)
- Rallies or protests
- Petitions and public comments
- Gaining and independent assessment
- Use of experts and research
- Articulate alternative plan
- Suppression and/or violence (including state violence)
- Other (please mention):

Outcomes and concessions

- No change / status quo
- Proposed project not built or existing project phased out
- Change design or route
- Delay project
- Provide compensation or remediation
- Violence and state violence, repression and suppression or arrests by police or death threats
- Broader policy or regulatory change
- Other (please mention):

Name:**What is the energy infrastructure?**

Add

Name of project

Add

What is the event?

Add

Description

Add

Who are the actors?

Protesters / Infrastructure opposers

- Add

Infrastructure supporters

- Add

Tactics

Add

Outcomes and concessions

Add

Bibliography

Add

Inclusion and exclusion criteria:

- Needs to be recent, within past 10 years (so 2010 onward)
- Needs to have sufficient information (we must be able to answer all five of our questions above)
- It can include transition actors from a region that go outward, i.e. to lobby or to litigate in a capital city or national location
- It can include petitions or mobilization to keep energy infrastructure open, not only to close it down