Intermediary ecologies and participatory infrastructures in wind power planning – towards a practice of design for just transitions

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Abstract: This paper analyses how transition intermediaries and participatory infrastructures shape an unjust energy licensing process and outlines implications for design for just transitions. Centring on the Fosen Wind Farm in Norway, where wind power development violated Indigenous Sámi cultural rights, it traces how licensing enabled renewable expansion while generating democratic and rights-based conflicts. Using historical case analysis and a synthesis of various literatures, the paper explores the intermediary ecology of licensing and shows how interactions among transition intermediaries structure power asymmetries. In dialogue with design research on infrastructuring, it proposes three practices for design in just transition contexts: unveiling institutional–cultural divides, platforming under-represented voices, and engaging in ongoing collaborative infrastructuring and reflexivity. It argues that designers must act in power-aware, rights-oriented ways if transitions are to be both sustainable and just.

Keywords: transition intermediaries; just transitions; infrastructuring

1. Introduction

‘Design-led’ transitions have been promoted by scholars across the emerging fields of Transition Design (Irwin, 2015; Irwin, Tonkinwise and Kossoff, 2020) and Design for Sustainability Transitions (Ceschin and Gaziulusoy, 2016; Gaziulusoy and Erdoğan Öztekin, 2019). However, design 'leading’ transitions through the lens of traditional strategic, managerial, and solutionist approaches has been touted as being potentially “too nice”, “too polite”, “reformist” and not “revolutionary” (Willis, 2015), and not anywhere near politicized enough (White 2019, 2020) to unravel and re-direct the myriad of forces that sustain the current capitalist and neo-colonial paradigm. Radical and critical design studies (Ansari 2025; Fry, 2009; White, 2019; Ehn, Nilsson and Topgaard, 2014) open important shifts in how design theory and practice is being deepened in relation to anthropology, critical theory,

organisation theory, sociology, systems theory, and ecology. A move beyond object-centered design towards design as a 'world shaping force' (White, 2019) highlights the responsibility of the design discipline in 'redirecting' practices of 'assembling' socio-technical and socio-material networks (Fry, 2009) towards a new way of being and living on a warming planet. The 'infrastructural turn' in design (Le Dantec and DiSalvo, 2013; Karasti, 2014; Björgvinsson et al., 2010) renders new conceptualisations of how design might actively engage with the 'material politics' (White, 2019) of socio-technical transitions, and play a role in the making, remaking, and co-creating of socio-ecological futures.

It is with the 'redirective' practices and 'infrastructuring' intent of design in mind, that we turn our attention to the 'transition work' (Löhr, Chlebna and Mattes, 2022) already playing out, and where 'diffuse design' (described by Manzini (2015) as the design skills of lay publics) and potentially 'expert design' have played a role in shaping land-use and energy futures in Norway amongst a broader 'green transition' agenda. Our case centres on the former wind power licensing process that was used to legitimate the Fosen Wind Farm and resulted in one of the largest wind energy developments in Europe being built; and therefore, was a strategically significant project for both Norway and the wider European renewable energy transition. The case is perhaps even more significant for the landmark Supreme Court ruling that found the wind farm development to threaten the continuation of traditional reindeer husbandry and thus violate Indigenous Sámi cultural rights to enjoy their traditional culture. It is at this tension point between sustainability transitions and democratic rights, where questions of ownership and control arise, and where norms, practices, and processes of power-wielding institutions come into question. It is for these reasons that we define our case as an '(un)just' sustainability transition.

We look at the case through the lens of 'transition intermediaries' to 1) examine the infrastructure of the licensing process (i.e., how different actor roles, functions, and dynamics are arranged), 2) reflect on parallels between transition intermediary roles and functions, and those of design, and 3) to speculate on 'redirective practices' for a design for just transitions approach that is power-aware and rights-orientated. In doing so, we ask the questions: *What types of intermediaries exist in unjust transition cases?* And *what might the role of design be in 'redirecting' these processes towards both sustainable and just futures?* More broadly, our case and research engage with themes of 'troubling transitions' through its focus on the complex, messy, antagonistic and ethical work at the very heart of sustainability transitions happening globally. Through engaging with these tensions, we hope to move towards an expanded understanding of design roles and orientations for just sustainability transitions.

1.1 Approach and methods

To answer our research questions, we undertook a historical case analysis (Yin, 2014) to trace the decision-making involved in the development of the wind farm, subsequent backlash, and final mediation and agreement-making process. Historical case analysis is a particularly pertinent research approach in transition studies (Geels, 2002) as it enables a longitudinal analysis of the real-world dynamics of various political and institutional interventions, and a broad tracing of actors, activities, and cause-and-effects inherent in these interventions. The Fosen Wind Farm case is an exemplary landmark case with

extensive documentation and analysis across academic and grey literature. Our tracing of the case is based on a review of the literature which spans the fields of international law and human rights, natural resource governance, political science, and Indigenous rights.

Our method included:

1) An academic and grey literature review (including web scan of media articles) to map the timeline of events in the Fosen case, and to understand 'key junctures'. These were defined as events that brought together the main actors in a regulatory, legislative or formal setting, and where agreement or disagreement occurred.
2) A literature review of 'transition intermediaries' scholarship to scope and synthesise relevant transition intermediary concepts and typologies.
3) An in-depth mapping of the historical wind power licensing process using academic literature, and in reference to Fosen case analysis.
4) Analysis of the actors and their roles in the licensing process, in relation to the synthesised transition intermediary framework.
5) Speculation on design roles in relation to the analysis, and with reference to 'infrastructuring' literature.

It should be noted that limitations of our approach include our relative distance from the case itself and subsequent reliance on academic analysis and grey literature. Our mapping of the case at this point remains relatively high-level and based on available secondary data. Research bias and subjectivity has been somewhat mitigated by prioritising peer-reviewed academic literature that details different aspects of the case. This research is part of doctoral research, which will contextualize and deepen the case analysis for other publications.

2. Understanding intermediaries and links to design: overview of the concept and recognised typologies

To answer our first question on the types and roles of transition intermediaries, we present a synthesis of the literature on transition intermediaries. We then link transition intermediary work to 'design work' through the concept of 'infrastructuring'.

2.1 Transition intermediaries, functions, and ecologies

The roles and functions of intermediaries have been closely examined in relation to innovation and transition processes. They are largely characterised by their 'in-betweenness' (Moss, 2009) as agents or brokers connecting and facilitating between two or more parties in any aspect of the innovation process (Howells, 2006). In transitions studies, they are recognised for their influence in transitions processes through "linking actors, activities, skills, and resources, to create momentum for change, create new collaborations around niche technologies, ideas and markets and disrupt prevailing socio-technical configurations" (Kivimaa et al., 2019, p.1062). 'Transition intermediaries' refer to the actors across multi-levels (Geels, 2002) that work to advance transitions, from grassroots and local action to shifting existing institutional frameworks and creating new ones. Kivimaa et al. (2019) acknowledge the broad literature on specific and critical roles that intermediaries play in certain phases of transition and suggest a typology of roles across multi-levels (Table 1). The various roles embody different goals, normativity and neutrality according to their position

as a niche, regime, systemic, user, or process intermediary, which in turn adds to the diversity of political interests within the 'intermediary ecology' (Kivimaa et al., 2019). These different remits and competencies within the intermediary ecology can lead to synergy and complementarity, but also fuel conflict and reveal power hierarchies (Manders, Wieczorek and Verbong, 2020; Kanda, Mignon and Moreno-Serna, 2025; Laur and Kanda, 2025; Upham et al., 2026).

Gaitán-Cremaschi, Valbuena and Klerkx (2024) and Kivimaa et al. (2019) centre the 'intermediary ecology' as central force in shaping *how* transitions emerge, and *whose* interests are prioritised. Collective and pivotal intermediation might occur within the network of actors in order to overcome shared barriers or challenges and/or drive specific interests (Gaitán-Cremaschi, Valbuena and Klerkx, 2024, p.1609). 'Pivotal intermediaries' are recognised as orchestrators of collective intermediation, who might operate at different levels and contribute to diverse transition pathways (2024).

The final element of our conceptual framing regarding transition intermediaries is the role of 'incumbents' in shaping transition outcomes. Sovacool et al. (2020) focus on the role of incumbents in transitions, defining them as groups that "have a vested interest in maintaining the status quo", and who grapple with maintaining institutional and technical stability versus shifting or transforming in relation to transition forces. They expand on Kivimaa et al's (2019) typology by exploring ways in which intermediaries orientate towards different market, civil or institutional incumbents to facilitate transformation and/or conformity.

Table 1 Synthesised typologies, functions, and ecologies of transition intermediaries. These frameworks and concepts have been brought together to structure a hypothesis regarding actors, dynamics and relations within transition intermediation.

Category	**Typology/description**
Transition intermediary types and functions (Kivimaa et al., 2019)	• *Systemic intermediaries* intervene on a system level between multiple actors and interests. Functions include: opening up space for new and diverse kinds of activity; catalysing innovation; remaining politically, technologically and financially neutral; pursuing a strong change imperative; disrupting configurations; setting up experiments; articulating, negotiating and aligning multiple interests. • *Regime-based intermediaries* work at a systems level between multiple actors and within mandate given by dominant regime actors. Functions include: undertaking reformist and incremental practical action (rather than radical and political); translating regulation and making sense of the policy environment. • *Niche (or grassroots) intermediaries* intermediate between local projects and/or higher level of aggregation. Functions include: facilitating sharing and development; connecting local and wider ecosystem through relational work;

	supporting niche development and diffusion; aggregating knowledge and resources. • *Process intermediaries* work within experimental projects or specific processes contributing to transitions. Functions include: facilitating and supporting the realisation of projects; being neutral actors between niche and regime and advancing day-to-day activities; 'non-championing' transitions but rather focusing on processes and material actions; brokering different priorities. • *User intermediaries* intermediate between technology (provided) and use, and/or niche technology and the dominant configuration. Functions include: supporting user-level adoption of novel technology; articulating demands from users; facilitating knowledge sharing networks.
Incumbency-intermediary dynamics (Sovacool et al., 2020)	• *Governmental and regulatory incumbent-oriented intermediaries* focus on extending or retaining political authority or policy influence over the direction and content of socio-technical change, policy or regulation. They may harness innovation to deliver political objectives and fulfil mandates. • *Market or business incumbent oriented intermediaries* focus on the delivery of products and services by the private sector and promote particular business models, new technologies or practices. • *Civic incumbent-oriented intermediaries* attempt to retain or claim control over public or civil society networks, user groups or individual citizens.
Collective and pivotal intermediation (Gaitán-Cremaschi, Valbuena and Klerkx, 2024)	• *Collective intermediation* refers to the networked interactions among diverse actors distributed across the multi-level perspective. These dynamics between intermediaries are potentially more important than the role of individual intermediaries. • *Pivotal intermediaries* refer to those who orchestrate collective intermediation and operate at different levels within the multi-level perspective.

2.2 Design, 'infrastructuring' and links to intermediation

While much has been said about the role of facilitation and innovation capacities of transition intermediaries, little work has been done to explicitly connect intermediation to practices of design. Within the transition intermediary literature, Fischer and Guy (2009), Hernberg (2022) and Hernberg and Hyysalo (2024) have highlighted the role architects play in the realisation of low-carbon buildings and broader urban sustainability transitions through mediation of regulatory landscapes, technical requirements, creative ambition, and user-needs, as well as their 'interpretative practice' in negotiating various (and often

competing) requirements. Interaction design and participatory design researchers have followed suit in recognising specific design skills related to intermediation, specifically in facilitating interactions and relations between people, communities, institutions, technologies, and commoning practices (Bollier and Helfrich, 2019). In participatory design, Teli et al. (2020) frame the work of design intermediation as focusing on emancipatory and relational efforts between communities and institutions in design processes, noting that intermediation is "when designers try, strategically to promote social change through both participatory and institutional processes and frameworks" (Teli et al., 2022:4. See also Cibin et al., 2020; Smith and Iversen, 2018). They underline intermediation as a primary competence, rather than as a loosely constructed or eclectic grouping of other occupations or design practices; highlighting it as a political and participatory practice that utilises the designer in acts of 'cultural intermediation', often in pursuit of shared governance.

'Infrastructuring' is a participatory design concept born out of 'information infrastructures' (Neumann and Star, 1996), that we use here to describe the work of design in both acting *as* an intermediary, and *with* intermediaries in assembling and/or re-assembling socio-material and socio-technical systems. Design 'work' can be viewed as entering and acting in networks of working relations that make up socio-technical systems (Suchman, 2002, p.92), and therefore practices of infrastructuring engage with the ongoing process of making, re-making, assembling and re-configuring these relations beyond the initial scope of design (Le Dantec and DiSalvo, 2013; Karasti, 2014). This continuous co-creation approach is described as a collective interweaving of people, objects and processes (Björgvinsson et al., 2012).

Drawing together the concept of infrastructuring, transition intermediation, and emancipatory or justice-orientated practice brings attention to power constellations inherent in socio-technical, participatory infrastructures, and consequently what underpinning epistemologies and rationalities are privileged in their designs. We turn to our (un)just sustainability transition case to further unpack this relation between intermediary ecologies, participatory infrastructures, and power.

3. The case of Fosen Wind Energy Development – (Un)just energy transitions in Norway

3.1 Background to the case

Norway has been increasing its share of wind power generation amidst its total energy production portfolio to achieve ambitious national clean energy production targets, and meet commitments under the EU's Renewable Energy Directive and broader EU climate legislation. The increase in wind power has been rapid; rising from 1 per cent of total electrical energy production in 2010 to over 10 per cent in 2022 (Statistics Norway, 2026), with the acceleration being driven by Government-led policy instruments such as 'green certificates' and tax incentives (Ellingsen, 2024). However, the 'top-down' approach to 'green' development has faced backlash and democratic legitimacy challenges, particularly in Indigenous Sámi reindeer herding territories where scholars, activists, Sámi communities and NGOs have deemed several developments to be forms of 'green colonisation' (Kårtveit, 2021; Allard, 2025). These groups point to the lack of recognition of Indigenous Sámi cultural

rights in wind farm permitting procedures as a key driver of violations (Osakada, 2024; Ellingsen, 2024).

The Fosen Vind case in Norway represents both a landmark legal case, and a 15-year battle (with ongoing tensions) between Indigenous Sámi reindeer herders and one of Europe's largest onshore wind farm developments. The Fosen Vind development includes six wind farms located on the Fosen peninsula; two of which are in the grazing district where Sør-Fosen Sijte and Nord-Fosen Sijte (Sámi communities) have practiced reindeer husbandry since time immemorial (Cambou, 2023). The wind farm licensing process and resulting decision to proceed with development of Storheia and Roan wind farms was at the centre of the dispute, which was brought forward by the two Sijtes, and supported by other groups such as Sámediggi/Sámi Parliament. The dispute moved through the District Court, Court of Appeal and finally the Supreme Court, where the 2021 verdict ruled unanimously that the decision to construct the wind farms violated the cultural right of the Sámi groups (2023). The ruling established that the project constituted a threat to the survival of reindeer husbandry in the region, and that proposed mitigation measures were not sufficient given they deviated significantly from traditional herding practices and were not adequately assessed by public authorities (2023; Mósesdóttir, 2024). According to Cambou (2023), the ruling was 'landmark' as, not only did it establish a violation of cultural rights for the first time, but it also recognised the significance of Sámi knowledge and scientific knowledge in assessing impacts on the cultural rights of Sámi; the right to benefit from reindeer herding as a cultural practice; the significance of consultation; and finally, the significance of both the 'green transition' and the human right to a healthy environment, *as well* as ensuring the State does not put economic development above the right of minorities to enjoy their culture (regardless of the projects legitimate support by the democratic majority or the importance of the green transition for society).

This case establishes an example of a 'top-down', 'regime-led' energy transition, where the licensing process – at the heart of the dispute – was designed in a way to favour the influence of pro-wind power groups (Inderberg et al., 2019). This licensing process was moved from municipality control to the Norwegian Water Resources and Energy Directorate/Norges vassdrags- og energidirektorat (NVE) (a subsidiary of the Ministry of Petroleum and Energy/Olje- og energidepartementet (OED), now called the Norwegian Ministry of Energy) in 2008, as the government argued that "energy is a crucial sector that should be under central state control" (Inderberg et al., 2019, p.184). This centralisation of power, the "one-stop-shop approach" to licensing (Gulbransen, 2025) and the Government's pro-renewable institutional culture all resulted in a restriction on the level of influence of oppositional voices and a lack of recognition of Sámi cultural rights (Inderberg et al., 2019). It should be noted that considering widespread local opposition to the State-controlled licensing system, municipalities were reinstated as planning authorities in 2023 (Gulbrandsen, 2025) and the licensing system has shifted because of the new arrangement.

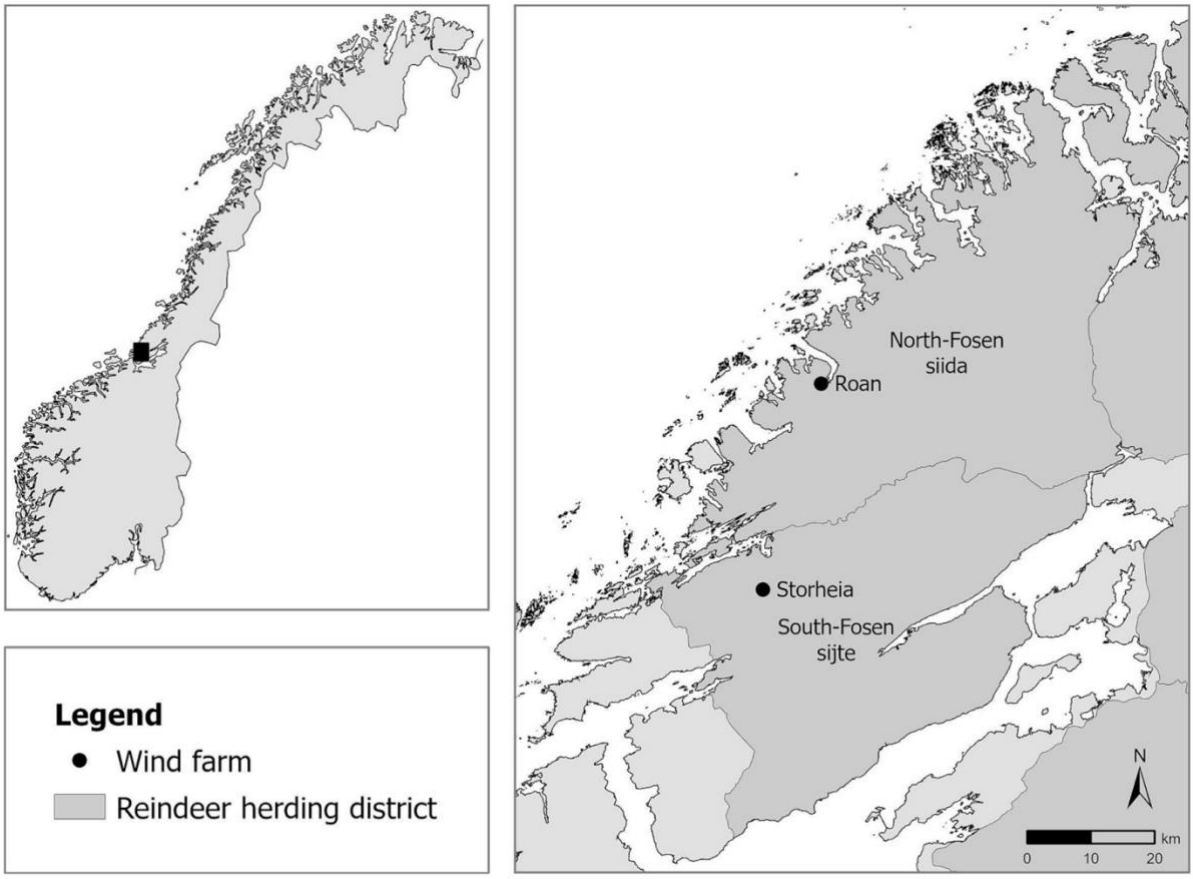

Figure 1: The Fosen peninsula and its location in Norway, including the two wind farm sites at the centre of the dispute and the reindeer herding territories (Potthoff and Cashmore, 2026:2).

3.2 The historical licensing process

In the case of Fosen Vind, we are interested in the historical wind farm licensing process (orchestrated by NVE), as well as the wind farm feasibility study (led by the energy developer). Our focus on the historical process is due to large body of literature analysing the Fosen Vind case, the record of events, decisions, and actors, and the notable asymmetric power relations that resulted in an unjust licensing process. Our units of analysis (Table 2) include the phases of the former licensing process (including the feasibility study), as well as the actors facilitating and involved in each phase.

Table 2 Author's synthesised description of the historical wind power licensing process in Norway adapted from Inderberg et al. (2019). This table presents an overview of the key stages in the historical licensing process, including the lead facilitators and decision-makers, and involved parties. It does not showcase the veto powers of the different groups, nor the informal activities that take place outside the process that influence the final decision.

Stage of licensing	Description	Organising groups	Involves...
Pre-licensing: Area screening/ feasibility study	This phase involves the energy developer conducting a general survey of an area, assessing technical criteria, identifying	Energy developer	'Affected parties' and landowners – may be involved in contracts

	environmental and social interests, and engaging potentially affected parties.		regarding access to an area
Stage 1: Notification, 1st public hearing, and EIA programme	This phase involves the energy developer sending a notification of the project to the NVE and formally initiating the licensing process. The NVE lead public hearings to gather inputs on aspects for the Environmental Impact Assessment (EIA). These inputs go into an EIA programme.	Energy developer – public announcement NVE – lead public hearings	'The public' (i.e., relevant municipalities, landowners and neighbours, NGOs etc.) – involved in hearings and provide inputs on aspects for the EIA Norwegian Environment Agency – might provide advice on EIA Ministry of Climate and Environment – might provide advice on EIA
Stage 2: Application including EIA, 2nd public hearing, and objections	The developer submits their application and EIA and the NVE organises a second round of public hearings. If objections are raised, a mediation meeting is organised by NVE to discuss possible mitigation measures.	Energy developer (and private consultant) – undertake EIA and submit application NVE – lead public hearings	Public administration (i.e., Sámi authorities, local and regional authorities, environmental authorities) – can raise an objection and participate in mediation OED – facilitates mediation meeting
Stage 3: Decision by NVE	NVE make a decision on granting the license based on an overall assessment of the benefits of the project and the negative impacts.	NVE – make decision on license	
Stage 4: Appeal process and final decision by OED	Opposing parties with a legal interest can appeal NVE's decision to the OED. During the appeal process, the OED undertakes on-site inspections and organises meetings with concerned parties in the host municipality. I might also ask for additional reports, hold separate meetings, and engage in discussions with other relevant ministries and national bodies before making a final decision.	OED – make a decision if an appeal is raised	Public administration (i.e., Sámi authorities, local and regional authorities, environmental authorities) – can sustain their objection through raising an appeal.

4. Analysis – Intermediary ecology and the historical wind power licensing process

Our analysis of the licensing process brings together the intermediary types, functions and dynamics with the key phases of the licensing process. Our analysis broke down each stage in the licensing process by actor, their stance and activities in the stage, their relationship to the 'transition intermediary' types and functions (Kivimaa et al., 2019; Hernberg and Hyysalo, 2024), level of incumbency (Sovacool et al., 2020), intermediation of incumbency (Sovacool et al., 2020), and role in collective intermediation or as a pivotal intermediary (Gaitán-Cremaschi, Valbuena and Klerkx, 2024). Our analysis resulted in several observations as elaborated below.

4.1 General observations on transition intermediary roles

Overall, it was observed how different actors dipped in and out of different intermediary roles, as well as taking on multiple intermediary hats at any given time. For example, the pre-licensing phase positioned the energy developer as a 'user intermediary' in working with landowners to obtain agreement to the project, and translating requirements and demands from local municipalities, landowners, special interest groups, and government and regulatory bodies. Their role also leans towards being 'regime-based', given wind farms as 'mainstream' technologies and the projects potential as a nationally strategic project.

In some cases, having multiple intermediary hats created tensions. For instance, NVE can be seen as a 'process intermediary' for their role in brokering the licensing process and having to be positioned as a 'non-champion' or neutral actor in advancing the process. At the same time, they are a 'regime-based intermediary' who operate with the mandate to develop "the knowledge needed to use natural resources to produce electricity" (NVE, n.d.). This tension is echoed by Inderberg et al. (2019, p.188) who express concern around the transparency of decision outcomes in the historical process, given considerable discretion was given to NVE, and all wind power decisions were made by the same unit within NVE (as opposed to other countries where this function is devolved to municipalities or regional authorities).

Additionally, different actors were brought in at various stages of the process to intermediate or mediate between different groups, knowledges, and progress decisions. This included municipalities, the OED, the Ministry of Climate and Environment, and private consultants to facilitate Environmental Impact Assessments on behalf of the project developer.

4.2 Incumbency and intermediation

A key tension revealed in the analysis was the role of incumbents and the role of transition intermediaries – that is those groups that "have a vested interest in maintaining the status quo" (Sovacool et al., 2020) and those that seek to advance change and/or broker different interests in pursuing sustainability transitions (Kivimaa et al., 2019). This relationship showed up through the role of 'appellants' in the licensing process. In various cases, Sámi groups, municipalities, environmental groups, NGOs and landowners might become appellants due

to concerns around various impacts of the wind farm. The interests of appellants in maintaining the status quo or raising various concerns about the development, may be seen as a form of 'incumbency' to those with who have a broader renewable energy transition directive. Given the research on Sámi experiences in state-led consultation processes, it must also be acknowledged the (often burdensome) role of Sámi actors as cultural translators (Sara, Rasmussen and Krøvel, 2021; Kløcker Larsen and Raitio, 2023; Fjellheim, 2023). This role can be considered burdensome given the effort in validating and justifying cultural practices to bureaucrats and developers (Fjellheim, 2023), and thus their subsequent position as 'governmental and regulatory incumbent-oriented intermediaries' in working to insert recognition of their cultural rights in the licensing process and, more broadly, government institutions. These demands are further emphasised by broader 'coalition-building' and 'intermediation' amongst Sámi representative groups, researchers, NGOs, legal experts, and UN Indigenous Committees occurring external to the licensing process to strengthen Sámi cultural rights recognition within the licensing process (Fjellheim, 2023; Mósesdóttir, 2024).

4.3 Collective and pivotal intermediaries

In their analysis of the previous wind power licensing process and actor influence on licensing decisions in Norway, Inderberg et al. (2019) highlighted the 'official' and 'de facto' veto powers across landowners, host municipalities, project developers, and the licensing authorities. Any individuals or organisations outside these groups had little chances in stopping the project except in connection with results of the Environmental Impact Assessment (2019). The different weightings of voices in the licensing process point to "the asymmetric relationship of the licensing authority relative to actors outside the energy sector" which Inderberg et al. (2019, p.189) argue "all led to [a] process which [favoured] the influence of pro-wind power groups". The veto powers were realised through a series of formal and informal practices across the licensing process and contributed to an unofficially defined core group who defined the outcome of license decisions (2019). These actors with official and de facto veto powers formed a group of 'collective intermediaries' whose voices held influence in the validation of the wind power project.

NVE's position as the key 'process intermediary' and as a key decision-maker positions them as a 'pivotal intermediary' in the broader process and ecology. This is further accentuated by their practice of advising developers to withdraw projects regarded as unfeasible, referring to an initial "holistic assessment" of the proposed wind energy project which takes into consideration regulatory requirements, municipality 'openness' to wind power, assessment of 'special interests' (such as environmental issues, Sami culture, and Armed Forces), and overall technical feasibility of the wind project (Inderberg et al., 2019). The reasons as to why the NVE recommends withdrawing a project are often unclear, highlighting the pivotal role NVE held over assessing and recommending developments. Concluding their analysis, Inderberg et al. (2019) point to the "very broad mandate" NVE held in the historical process, "to decide license outcomes at their own discretion" (2019, p.189).

In respect to missing voices in this previous process, and the broader collective intermediary ecology, scholars have drawn attention to the lack of acknowledgement of Sámi as 'rights-holders' (as opposed to stakeholders), and the impact this has on their veto powers, and

integration of free, prior, and informed consent (FPIC) principles (Sara et al., 2021; Kløcker Larsen and Raitio, 2019; Fjellheim, 2023). This highlights the lack of leverage Sámi groups have historically held in these processes, and the power of the collective intermediation that they have had to fight against.

5. Discussion and conclusion – reflecting on design and infrastructuring for just sustainability transitions

Our analysis has exposed a dynamic ecology of intermediation happening through the structure of the previous wind power licensing process. The process itself sought to intermediate between diverse interests to holistically assess the feasibility, viability and desirability of wind farm developments. However, in respect to the Fosen Supreme Court ruling and analysis undertaken by scholars, the previous wind farm licensing process was found to insufficiently account for Sámi knowledge and recognise cultural rights. This led to a violation of cultural rights and threatened the existence of traditional reindeer husbandry.

Our challenge now is in asking, what was/is the role for design in all of this? *How* did design play a role in the process? And how might it re-orientate to enable a 'just' energy transition in Norway? As mentioned in our introduction, without an explicit practice in materialising and working with power dynamics, a recognition and commitment to upholding collective rights, and a strong emancipatory and democratic focus, practices of design in/for sustainability transitions risk perpetuating the same paradigms that need to be overcome in moving towards a just, ecological future. It is also important to recognise the diverse entry points for new practices of 'design for just transitions' in supporting different groups to infrastructure, materialise, prototype, map, assemble, and visualise (among other capacities) their desired futures, opposed to an explicit focus on 'leading' and 'facilitating'.

In the Fosen case, we acknowledge that a form of design practice contributed to the licensing process 'infrastructure', in potentially both diffuse and expert capacities. While identifying the explicit types of design are beyond the scope of this study, we note that this is a fruitful area for further study, specifically in asking *who* is doing the designing, under what mandates or requirements are they bringing their designs into the world, *who* benefits from these designs, and what tactics are being used to counter unjust designs? Findings from this preliminary research noted that the historical licensing participatory infrastructure contained high power imbalances between intermediaries and was implemented in a 'top-down' fashion, therefore asking further ethical and political questions of designers – what is their extended responsibility? And further, what is their remit for enabling reconciliatory sites that can be a part of addressing past injustices?

Additionally, it's important to acknowledge the invisible ways that design may have showed up in the historical licensing process, such as through coalition-building between Sámi rights groups in engaging in appeal processes. There are potentially multiple ways Sámi groups are infrastructuring coalitions, collaboratively designing appeals, engaging with State-led participatory infrastructures, and designing interventions for increasing rights recognition that are lead through Indigenous epistemological framings. Further inquiry into these

practices will be part of ongoing doctoral research, however, for now we might acknowledge these as potential 'redirective practices' in unjust transitions.

Expanding the explicit tactics and strategies of redirective practices, we reflect on our earlier question - *what might the role of design be in 'redirecting' [participatory] processes towards sustainable and just futures?* For now, we propose several speculatory practices for infrastructuring just participatory processes in/for just transitions. These practices are extrapolated below with reference to our case.

1. Unveil institutional-cultural divides and power asymmetries in transition processes – In entering into networks of relations where contexts, alliances, and attachments exist (Suchman, 2002; Marres, 2007), design can make visible current socio-political-environmental-technological arrangements. In the instance of the pre-licensing process, a design for just transitions approach might be employed to make visible environmental and social histories, multi-level assemblages and actor relations, and local cultural protocols in agreement-making. In pre-licensing, pre-hearing, and pre-appeal phases, it might act as a 'third-space' in mediating or translating between institutional and cultural groups, with emphasis on relation-building. Design for just transitions might have a competence in pluriversal 'tooling' or 'instrumenting' with a sensitivity to the affordances of instruments in perpetuating or redirecting power dynamics.
2. Platform under-represented voices - Design for just transitions approaches might create platforms for underrepresented voices and those with collective rights, through materialising or facilitating democratic decision-making forums, and potentially creating prototypes that are sensitive to local cultural protocol. 'Platforming' might include creating flexible and relational structures that enable relations between actors, and materialising strategies to bring in under-represented voices at key moments, such as during final decision-making. 'Platforming' might also involve creative ways of inserting voices from the future or the past, or from more-than-human species in decision-making forums.
3. Engage in processes of collaborative making, re-making, and reflexivity – Design for just transitions approaches might open processes up for 'infrastructuring', where assemblages of actor-networks and material-things become continuous prototypes for collective intermediation. In the licensing process, the area screening or hearings might bring in a design for just transitions approach to prompt a moment of collaborative infrastructuring and innovating of a culturally and locally relevant socio-technical assemblage. It might then be employed to prototype and test this assemblage in situ to understand affordances and potential re-arrangements that create equitable outcomes. Importantly, it might enhance moments of reflexivity – is this working for everyone? Who's benefitting and who's not? And what futures are we materialising?

5.1 Concluding remarks

Our research has traced the roles of transition intermediaries in a historical licensing process that was at the centre of an 'unjust energy transition'. Throught this activity we were able to unpack an ecology of intermediation involved in realising a renewable energy transition, and

the licensing 'infrastructure' that facilitated high power asymmetries. We propose that emergent practices of Transition design and design for sustainability transitions must be attuned to the normative assumptions of 'transitions' themselves and seek to foreground justice issues and power asymmetries. How to design for just and equitable sustainability transitions in a rapidly warming world is perhaps the growing pain of our time.

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