



Original research article

“After the leases are signed, it's a done deal”: Exploring procedural injustices for utility-scale wind energy planning in the United States

Salma Elmallah^{a,b,*}, Joseph Rand^b^a Energy and Resources Group, University of California, 345 Giannini Hall, Berkeley, Berkeley 94720, CA, USA^b Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley 94720, CA, USA

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ABSTRACT

Expanding wind energy deployment to meet climate and policy goals requires willing communities to host wind projects. Wind power acceptance is inextricably linked to perceptions of projects' planning process, but it is less understood what makes wind planning processes more or less fair. Using a mixed-methods case study research design, this paper evaluates the planning process for two state-approved wind farms in Ohio and Minnesota using four analytical themes relating to procedural justice: participation, information, decision-making, and local context. In doing so, we provide one of the few detailed mappings of a United States wind farm planning process. Our findings confirm other results in the wind planning literature, particularly with respect to the limited opportunities for participation and decision-making input afforded to the public. However, our study also argues that to realize procedural justice in utility-scale wind project planning, planning processes need to evolve to: (1) afford non-compensated neighbors of wind projects similar information and participation opportunities as compensated landowners, (2) provide additional resources for and knowledge-sharing opportunities among local (county and township) governments, (3) create structures for participation, information provision, and decision-making surrounding wind farm construction, operation, and decommissioning (not just siting), and (4) consider local contexts of historical power generation and resident connections to the land.

1. Introduction

The increasing proximity of utility-scale wind development to communities necessitates research that considers public engagement and coexistence strategies in wind power development [1]. Previous research on public acceptance of wind power from a range of geographies has demonstrated the importance of process fairness, transparency, and public decision-making involvement in influencing the acceptability of proposed wind projects and attitudes towards existing projects [2–5]. Although the importance of process is well established in the literature, fewer papers provide an overview of wind farm planning processes in the United States. This paper asks: how can state-led planning processes better incorporate procedural justice? This question is relevant not only for onshore wind development, but also for other energy developments sited in rural areas without a history of large-scale energy infrastructure sites [6].

Although past research has found that acceptance of wind energy is positively correlated with perceptions of the planning process as fair and participatory [7], we still have limited knowledge of how a wind farm planning process unfolds from the perspective of community members and their local elected officials. Motivated by prior literature (e.g., [8,9]), this study maps and investigates two state-led wind project planning processes to better understand the role of structural vs. implementational factors, as well as the influence of inequitable participation opportunities on overall procedural justice. Further, this research examines local decisionmakers' (i.e., county elected officials) perceptions regarding the availability, sources, and trustworthiness of information on the proposed wind project and how information deficits and asymmetries further affect perceived fairness.

This paper first reviews relevant literature to propose four analytical themes through which a wind farm planning process can be studied. We then use a mixed-methods case study research design of two US wind

Abbreviations: ALEDA, Albert Lea Economic Development Agencies; ALJ, Administrative Law Judge; GNA, Good Neighbor Agreement; MN, Minnesota; MPUC, Minnesota Public Utilities Commission; OFBF, Ohio Farm Bureau Federation; OH, Ohio; OPSB, Ohio Power Siting Board; PAWES, Public Acceptance of Wind Energy Survey; PILOT, Payment in lieu of taxes; STS, Science and Technology Studies; UK, United Kingdom; US, United States; USD, United States dollars.

* Corresponding author at: Energy and Resources Group, University of California, 345 Giannini Hall, Berkeley, Berkeley 94720, CA, USA.

E-mail address: salmae@berkeley.edu (S. Elmallah).

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farms, Blue Creek Wind in Ohio and Bent Tree Wind in Minnesota, drawing on data from the Lawrence Berkeley National Laboratory Public Acceptance of Wind Energy Survey (PAWES) [10], content analysis of permitting documents, and interviews with local decision makers to chart the planning process for both wind farms, and to relate process characteristics to procedural justice. This paper aims to comprehensively map out the siting processes of two wind farms and, in so doing, further our understanding of the structural and implementational factors that influence procedural justice outcomes in state-led wind farm planning.

2. Relevant literature

2.1. Wind power and planning processes in the United States

The importance of wind power planning processes in relation to wind power acceptance in the United States [2,4,11–13] and in other countries [3,5] is articulated throughout the wind power siting and acceptance literature. These studies often focus on surveyed perceptions of the planning process, finding that “having a say” or otherwise participating in the planning process is a statistically significant predictor of a process being perceived as fair [2,4]. Per Rand and Hoen [7], numerous studies have shown statistical correlations between perceptions of a planning process and acceptance of wind turbines. In the context of wind energy planning specifically, research has shown that more participatory processes can reduce local conflict and result in better outcomes [7], but there are often significant barriers to genuinely participatory processes [14]. In some wind energy planning models, local citizens have been removed entirely [15], following a process known as “decide-announce-defend” [16].

Studies that explore residents’ perceptions of wind energy also tie these perceptions to the planning process. Groth and Vogt, for example, argue that early negative perceptions of wind power can become truth to an individual, but can be resolved by applying earlier, more integrated, and more collaborative processes [17]. Their conclusions mirror Mills et al., who find that individuals who perceived an unjust process also perceived greater impacts of wind energy – pointing to the importance of both acknowledging and meaningfully incorporating community members in planning processes [18].

Research on offshore wind power siting uses semi-structured interviews to show how fractured trust in state government can drive perceptions of project fairness [12], while informal actions to meet stakeholder expectations and build trust on the part of planning process leaders can enhance acceptance of projects [13]. While survey-based studies orient us to the importance of planning processes in overall acceptance and fairness perceptions, the structure of planning processes themselves – including who makes decisions, and which actors are involved and when – remains understudied and is better examined through additional mixed-methods or interview-based research.

Part of the challenge of mapping and comparing wind project planning processes is that regulatory and procedural guidelines for wind project planning differ considerably across and even within countries. In the U.S., there are three overarching planning modalities for land-based wind development: state-led, county-led, or split-authority, in some cases depending on the installed capacity of the wind project or other factors [19]. Offshore wind planning in the U.S. is governed primarily at the federal level by the Bureau of Ocean Energy Management. Structural differences between these modalities can substantially affect fairness outcomes and perceptions. Within wind farm planning processes that assign authority to the same level of government (e.g., a county or a state), the process can vary with respect to mandated public participation opportunities, opportunities for public input, and other aspects of process design.

Of equal importance to the structural differences affecting procedural justice is to better understand how differences in implementation (i.e., developers’ actions) within a particular planning structure or

regulatory framework (e.g., state-led) might result in differential fairness perceptions or justice outcomes. Ottinger et al. (2014) demonstrate the differential implementation of planning processes in their study of one county-led and one state-led wind farm planning process in Washington State. They find both processes are limited in how they perform relative to standards of procedural justice, recommending a move in wind farm siting processes to collaborative governance at the county level, where residents can be more effectively included in planning processes [8]. This study points to the importance of local government in ensuring public participation and suggests the importance of research that investigates how local governments are involved in wind farm planning processes and interface with residents. Ottinger et al. (2014) also observe that planning processes can differ in implementation from how they appear on paper, which reinforces the need for additional research that investigates wind farm planning processes developed within similar regulatory structures (i.e. state-led or county-led processes).

Beyond Ottinger et al. (2014), detailed mappings of wind farm planning processes are rare, though many researchers provide valuable insights on specific aspects of planning processes. Jacquet (2015), for example, focuses on the participation of private landowners in siting through land leasing negotiations. This study introduces the idea of “private participation” in wind projects and gas drilling, showing that compensated private landowners perceive “more information and more opportunities for participation in the planning and siting process” which contributes to overall more favorable perceptions of the local energy industry and infrastructure [9]. These results show that the experiences of private landowners are key to understanding perceptions of participation and raise the question of how non-compensated landowners and residents engage with planning processes. Still, more research is needed to understand the inequitable opportunity for wind project planning participation across members of the public, and the implications of those inequities on procedural justice.

2.2. How can we study a wind farm planning process? Insights from energy and environmental planning literature

Although detailed mappings of wind farm planning processes in the US are rare, studies of wind farm planning processes internationally (particularly in the UK) are more common (e.g. [20,21]), and studies of planning processes for energy and environmental facilities more broadly (e.g. landfills [22] and carbon capture and storage [23]) are numerous. Additionally, theoretical frameworks and discussions of planning processes situated in Science and Technology Studies (STS) (e.g. [15,24]), geography (e.g. [25]), and other disciplines provide guidance on how to study wind farm planning processes. In this section, we review literature that makes both theoretical and empirical contributions to the study of planning processes and synthesize their contributions around 4 analytical themes: participation, information, decision-making, and local context. These themes guide our investigation of wind farm planning processes; they are expanded upon in the sub-sections below. We consider aspects of procedural justice – like transparency, fairness, and access, which are sometimes “complex, ambiguous and interrelated” [26] – to be embedded in each of these analytical themes.

2.2.1. Participation

Energy and environmental siting studies often emphasize that a just procedure considers representation of all affected by a decision [8,14,22,23], reflecting the “centrality of participation” in environmental and procedural justice [27]. Public engagement is often a given in guides to public participation and environmental planning [28], and studies of renewable energy planning in the UK find that planning officials and developers generally view engagement as normal business conduct tied to good practice and commercial sense [29]. Participation processes, specifically, are considered just if they are accessible to all affected parties, and if community members’ participation and input are

acknowledged as legitimate [8].

The degree to which planning processes are participatory can be understood by considering who is included, when communities are engaged, and how planning processes are structured.

When researchers talk about a procedure considering “all affected”, a “community”, or the “public”, who do they mean? In the context of wind siting, researchers have suggested that governance processes should involve residents of affected areas, as well as other concerned citizens (like non-profits or local officials) [8]. But as Aitken (2010) points out, rather than a single “local community” that is interested in the outcome of a planning process, there are often several communities, each containing a range of interests and perspectives [26]. Dunham et al. (2006) identify four distinct categories of “community”, including community of place, community of interest, community as virtual advocacy group, and community of practice [30], each of which has distinct relevance with respect to wind project planning.

Beyond who is considered, studies also discuss when communities are engaged. Researchers argue that communities should be involved in the earliest stages of developing a wind project in pursuit of developing an early understanding of stakeholders' needs and interests and to avoid secrecy and suspicion [5,14,26]. However, some developers perceive early engagement as wasteful because information changes as plans develop [29].

In the context of procedural justice, the structure of a planning process – and particularly of participation opportunities – is strongly tied to themes of inclusion and accessibility. Failures of procedural justice can be structural - by undermining the participation of less powerful groups [8] or expediting a process to the detriment of public participation [31]. A participation process that is structured to allow for accessible proceedings, is held in or near a community, and is held in languages accessible to community members, for example, facilitates wider inclusion of affected community members [8]. Researchers distinguish between participation opportunities structured to allow for uni- vs. bi-directional communication (between participants and decision-makers) [21,32], while one study suggested that developers prefer exhibitions – where communication is more uni-directional, and the “public” can be managed more effectively – over public meetings [29].

2.2.2. Information

Access to information as a criterion for procedural justice or transparency is ubiquitous in energy and environmental siting literature, which highlights the importance of information and notification that is accessible and provided through affordable, timely means [5,23,31] and through neutral intermediaries [33].

STS scholars complicate our understanding of information by showing how knowledge and information is often incomplete or insufficient despite meeting the standards set out by a participation opportunity or procedure. Ottinger (2013) argues that typical standards for informed consent are often not sufficient for facilitating procedural justice because of the “fragmented, changing, and necessarily situated nature of knowledge” [24]. In other words, the knowledge necessary for decision making can be hidden by powerful actors, can evolve with local understandings of siting hazards, or simply may not exist [15,24,34]. Phadke (2013) links the concept of “undone science”, or “areas of research that are left incomplete or ignored by experts” despite the concerns of social movements or civil society, to citizens' concerns about wind energy's potential risks [15]. Procedural justice, then, should involve systematic efforts to identify and address gaps in knowledge that are relevant to decision-making, and to make that information accessible to the public and decision-makers [24].

Aitken (2009) expands on how knowledge can be contested in contexts specific to wind planning, showing how planning processes can create a distinction between “expert” and “lay” knowledge that is reinforced by both experts and laypeople as well as the process itself. Participation opportunities may be structured to preclude meaningful

opportunities for laypeople to contribute their knowledge; in turn, laypeople might turn to experts to advocate for their stance [20]. In general, an emphasis on credentials and ‘expert’ knowledge can sideline oppositional or other local views [20], mirroring arguments in broader environmental siting literature that expert claims are privileged over local knowledge in siting processes [34].

Information and knowledge are also discussed in an institutional context, often in reference to local government. Wolsink (2000) cites “knowledge capacity” [16] as a key component of facilitating collaborative approaches to planning, building on scholarship in urban planning that argues that relationships between different levels of government allow for the flow of necessary knowledge to deliver policy objectives [35].

2.2.3. Decision-making

Energy and environmental siting literature largely characterize a fair process as one that involves consistent and impartial decision making [5,23,31]. Multiple studies also characterize fair decision-making as being dynamic and adaptive: a just procedure should consider if and how information changes throughout the planning process and involve decisions that are correctable in the face of new information [5,24], while considering multiple and potentially conflicting criteria [14]. Schlosberg (2004) emphasizes the role of participatory decision-making procedures as an element of and condition for justice [36]; other scholars echo this call, emphasizing the importance of including the public in decisions that affect them and engaging people as “local experts” who bring a rich and contextualized knowledge to decision-making [37].

A key takeaway from siting studies is that decision-making extends beyond the single decision of whether a project should move forward. Ottinger (2013) contests that participation during one decision-making process – e.g. the siting of a hazardous facility – can by itself constitute procedural justice; as local and scientific knowledge changes, communities should have access to ongoing processes of consent to the presence of hazards [24]. Indeed, in the study of a community wind project in the UK, Simcock (2016) finds that local inclusion and influence in multiple project decisions – not just the decision of whether a proposed project could proceed to construction – was vital to shaping perceived fairness of the project [21].

2.2.4. Local context

Significant literature has been dedicated to the importance of place in understanding the relationship between local communities and wind power (e.g. [2,25,38,39]). In their review of wind acceptance research, Rand and Hoen (2017) find that visual impacts and landscape change are frequently cited correlates to reduced support of wind projects. In the European literature and in some North American studies, place attachment (the bond between individuals and locations they inhabit) is found to influence wind energy acceptance [7]. Place attachment theory presents an alternative to the Not In My Backyard (NIMBY) framework of explaining opposition to wind power, with researchers arguing that wind power can disrupt an emotional attachment or sense of identity shaped by the physical and symbolic attributes of a location [38]. More recent studies based in the US have expanded upon place attachment theory, arguing that place attachment should be analyzed in tandem with identity, values, and livelihoods [2,39].

In connecting place and planning processes, studies note that policy-makers need to be cognizant of the unique challenges of siting wind in different locations with respect to place and aesthetics [2]. Simcock (2016) furthers this discussion by arguing that the “details of what is ‘procedurally just’ in any given situation are shaped by context and history” [21], suggesting that face-to-face forms of information provision are more vital in cases where project developers are new to an area, and that informal procedures of community engagement might suffice in regions with a positive history around wind development [21].

3. Materials and methods

This paper utilizes a mixed-methods case study research design of the planning processes for two United States wind farms, using survey data, semi-structured interviews, and content analysis.

3.1. Choice of case study sites: Bent Tree, Minnesota and Blue Creek, Ohio

The cases chosen in this study are Bent Tree Wind in Minnesota (MN) and Blue Creek Wind in Ohio (OH). These two sites were chosen based on the following key factors that enabled comparative analysis: The projects are comparable in size (rated capacity and number of turbines); both underwent permitting approval at the state level; their planning timeline was similar (~2007–2012); both projects were in the upper Midwest region with comparable physical geographies (landforms) and land uses; both were the first wind project in the counties hosting them; both had available survey data (see Section 3.2); and both had available public documentation of the permitting process for content analysis (see Section 3.3).

In the United States, a slight majority of states assign either state or split authority for siting wind farms – that is, a state agency has final approval over the siting of a wind farm in all or some cases (e.g. if a wind farm has sufficiently large capacity) [19]. OH and MN are two such states in which there is split authority to site wind facilities; in both states, wind plants with larger capacities (over 50 MW in OH, and over 5 MW in MN) are permitted at the state level. Studying planning processes in locations with state or split authority is important not just because this governance structure is already prevalent, but also because states are increasingly moving towards standardizing their internal “patchwork” of wind siting regulations and guidelines [19]. Additionally, this study investigates planning processes that are similar on paper, taking two cases where wind farms are permitted at the state level to understand both deeper structural differences and differences in implementation.

A descriptive overview of Bent Tree Wind (Minnesota) and Blue Creek Wind (Ohio) is shown in Fig. 1, and a structural overview of the permitting and siting process for each state is included in Section 4.1.

Demographically, the three counties involved in Bent Tree and Blue Creek Wind Farms (Freeborn County, Minnesota, and Paulding and Van Wert Counties, Ohio) are similar: in 2010, they were all majority (over 93%) white, with largely (77–79%) owner-occupied housing and similar median incomes (between 54,000 and 55,000 USD). In comparison to their respective states, all three counties have a greater percentage of white residents and owner-occupied housing and a lower median household income (which is about 71,000 USD for MN, and 56,000 USD for OH) [40].

3.2. Public Acceptance of Wind Energy Survey (PAWES)

The Public Acceptance of Wind Energy Survey (PAWES) is a 50-question multi-mode (phone, mail, and internet) survey. PAWES was distributed from 2015 to 2016 by researchers at Lawrence Berkeley National Laboratory (LBNL), the University of Delaware, and Portland State University to a nationally representative stratified random sample of residents living within 5 miles of utility-scale wind turbines in the United States [10]. Blue Creek had 64 responses to the survey, while Bent Tree had 18. These responses are used throughout the paper to explore how neighbors of each wind farm perceived the planning process.

3.3. Content analysis

Publicly available permitting documents are used throughout the paper to establish the sequence of the planning process and to better understand the structure of participation processes. Where applicable, news articles were reviewed to confirm details. The docket for Blue Creek Wind Farm is available on the Ohio Power Siting Board (OPSB) website as case number 09–1066-EL-BGN. The docket for Bent Tree Wind Farm is available on the Minnesota Department of Commerce website as docket number 08–573. Documents were used, initially, to establish the planning process and timeline in each case. For each planning process event, including hearings and public meetings, the permitting documents were used to determine who the event was open to, the structure and agenda of the event, and scheduling and notice given. The details, timeline, and information provided in these planning documents provided additional data and context for our analysis and discussion in Section 4. Documents were also used to identify participants for semi-structured interviews.

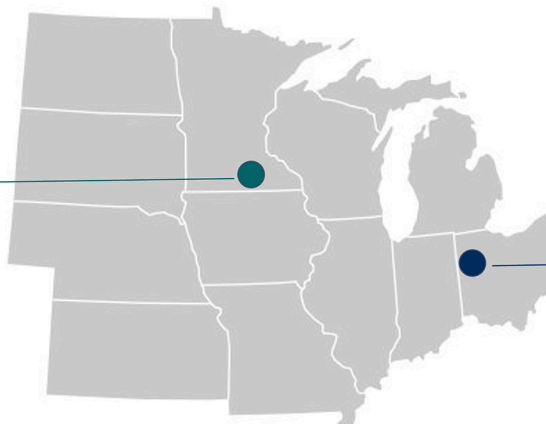
3.4. Semi-structured interviews

Initially, elected officials at the county and township level, the state permitting agency, intervenors (organizations that have been approved by the state planning agency to be a party of record in all recorded meetings) in the wind farm planning case, and a representative of the developer were contacted for interviews. Counties and townships from which elected officials were contacted were identified from each wind farm's permitting documents, as were intervenors (organizations such as economic development or farm bureaus that participated in wind farm-related hearings). While some local officials – particularly in the case of Bent Tree – were identified by name in project dockets, those official declined interviews upon contact because they were not involved in the planning process in practice. Upon input from the interviewees, county

Bent Tree Wind

Freeborn County,
Minnesota

- 200 MW (122 turbines)
- Planning timeline: 2007–2011
- First in county
- Local compensation: land leasing agreements, wind energy production tax revenue



Blue Creek Wind

Paulding & Van Wert
Counties, Ohio

- 300 MW (152 turbines)
- Planning timeline: 2008–2012
- First in county
- Local compensation: land leasing agreements, good neighbour agreements, payments in lieu of taxes

Fig. 1. Map of the US Midwest showing the locations of Bent Tree and Blue Creek wind farms.

staff (members of the county engineer's or environmental services office) were also contacted.

Table 1 summarizes individuals interviewed in both cases, with a total of 4 interviews conducted for Bent Tree Wind Farm and 6 interviews conducted for Blue Creek Wind Farm. All individuals interviewed held a role in their respective organization during the planning and construction of the wind farm except for the representative of the Ohio Power Siting Board (OPSB), who spoke more generally on Ohio wind farm siting processes. Interviews were conducted over the phone and ranged from 30 min to 1 h in duration. Interview questions can be found in the supplemental information (Section 6.1); in most interviews, additional and follow-up questions beyond the interview script were asked.

4. Results and discussion

The results of this research are presented using the analytical themes identified in Section 2.2, drawing from content analysis, semi-structured interviews, and survey data. Because of the small sample size of survey responses, we present quantitative survey data descriptively rather than seeking to establish statistical significance.

4.1. Overview of planning processes

In Minnesota, the permitting of large wind energy projects is governed by the Minnesota Public Utilities Commission (MPUC) under Minnesota Administrative Rule 7854. Under typical scenarios, the process is expected to be complete (from application to permit decision) within six months, and affords only two opportunities for participation by the general public (three if a contested case hearing is requested by an intervenor and approved by the PUC), including a public comment period and one public hearing [41].

In Ohio, wind project permitting responsibility lies with the Ohio Power Siting Board (OPSB). The OPSB mandates 3 in-person participation opportunities: a public informational meeting prior to submitting a formal permit application to gather public input and concerns, a local public hearing following the OPSB's initial recommendation, and an adjudicatory hearing. Additionally, a public comment period in which members of the public can submit comments to the OPSB through letter, phone, or email, is required as part of the planning process [42,43].

In both states, general standards and ordinances exist governing aspects such as required setbacks, studies/surveys, noise limits, road permits, crop or drain tile damage, decommissioning plans, and more. As long as developments are in compliance with these standards, public concerns regarding them may carry little weight [42,43].

Fig. 2 shows a timeline of the planning processes for both Bent Tree and Blue Creek wind farms. In both cases, the state permitting agency undertakes the final project approval decision.

4.2. Participation

Examining the opportunities and forms of participation in Bent Tree

Table 1
Semi-structured interviews conducted in each case.

| | Bent Tree (MN) (n = 4) | Blue Creek (OH) (n = 6) |
|-------------------------|---|------------------------------------|
| Developer | | 1 |
| State permitting agency | 1 (Minnesota Public Utilities Commission) | 1 (Ohio Power Siting Board) |
| Local elected officials | 1 | 2 |
| Local staff | 1 | 1 |
| Intervenors | 1 (Albert Lea Economic Development Agency) | 1 (Ohio Farm Bureau Federation) |

and Blue Creek wind farm showed that the public have limited meaningful opportunities for participation; land-leasing agreements, however, which are not typically included in discussions of participation, offer compensated residents earlier and more meaningful access to the developer.

In both Bent Tree and Blue Creek wind farms, participation took various forms. Any given participation opportunity or decision was open to a combination of actors, specified in Table 2. A key (government-mandated) mode of participation were public meetings. In the case of Blue Creek, both required pre- and post-application meetings were conducted in schools in the participating counties, and the public was given newspaper notice. In the case of Bent Tree, a required post-application meeting was conducted at county offices, and the public was given newspaper notice. Additionally, both the OPSB (in the case of Blue Creek) and the MPUC (in the case of Bent Tree) facilitate public comment periods in which members of the public can submit comments electronically or by mail.

A compensated landowner is an individual who either owned a property on which a turbine was sited or lived adjacent to such a property and had signed a contract to be remunerated by the project. Intervenors refers to parties that applied for and were granted the ability to testify in adjudicatory proceedings. While county and township governments can apply for intervenor status, in the case of Blue Creek Wind Farm, only the Ohio Farm Bureau Federation (OFBF) was involved in the adjudicatory hearing as an intervenor. Local government refers to staff or elected representatives at the county or township level. A land leasing agreement refers to a contract signed between developers and landowners on whose property a turbine is sited, while a Good Neighbor Agreement (GNA) refers to a contract signed between developers and landowners who live adjacent to land leased for the wind farm project. Development agreement meetings refer to negotiations between local governments and developers on land use, road use, and community compensation and investment.

The limited, mandated public participation opportunities reflected the observation that public engagement is viewed as a “given” by permitting agencies and developers [29]. In both Bent Tree and Blue Creek wind, public participation opportunities were hosted locally, with advance notice, and were open to all. These mandated participation opportunities met the basic requirement of being open to and advertised to all affected by the decision to permit a wind farm [8,14,22,23]. In Arnstein's ladder of citizen participation [32], these events were cases of either “informing” or “consultation”, where participants were either listening to developers or providing direct input to a state agency or judge. While these participation opportunities were technically “bi-directional” [21,32], where a judge could ask clarifying questions of intervenors or residents could ask questions of the developer.

The interviews showed that land-leasing meetings – between the developer and hosts or neighbors of a wind turbine – also constituted a form of participation. Official state guides to wind siting in both OH [42] and MN [44] describe the planning process as beginning with the developer application – which occurs after private meetings between the developer and landowners commence. In the case of Blue Creek Wind, interviewees consistently characterized compensated landowners as being both involved in the planning process at an earlier stage than any other party (including local and state government), and more likely to attend public participation opportunities partly due to a concerted effort by the developer. Although compensated landowners in Bent Tree Wind were similarly involved earlier in the planning process than other members of the public, those compensated landowners were not characterized as being more involved in meetings or more informed than the rest of the public, which the representative of the MPUC attributed to a “neighborhood divide” wherein compensated landowners were reluctant to show up to public meetings. Fig. 3, which looks at survey responses relating to participation by compensated and uncompensated respondents, indicates that compensated neighbors of Blue Creek Wind tended to perceive the planning process more favorably than

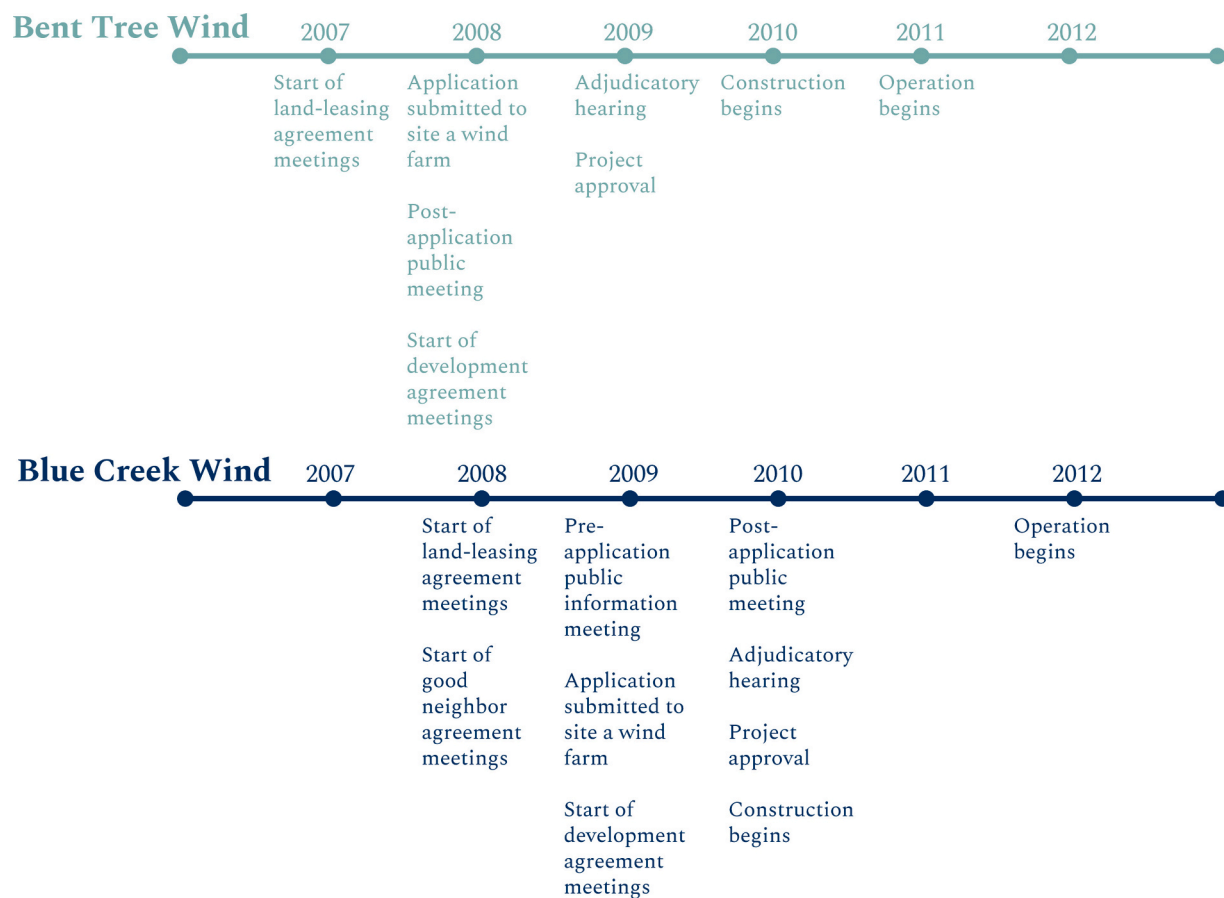


Fig. 2. Planning timelines for Bent Tree and Blue Creek wind farms. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Table 2
Participation opportunities and eligible participants in Bent Tree and Blue Creek wind farms.

| Participation opportunity | Eligible participants: Bent Tree Wind farm | Eligible participants: Blue Creek Wind farm |
|--|---|--|
| Land-leasing agreement meetings | Developer, compensated landowners | Developer, compensated landowners |
| Good neighbor agreement meetings | N/A | Developer, compensated landowners |
| Pre-application public information meeting | N/A | All, moderated by developer |
| Post-application public meeting | All, moderated by state permitting agency | All, moderated by state permitting agency |
| Development agreement meetings | State permitting agency, developer, local government agencies | Developer, local government agencies |
| Adjudicatory hearing | All (moderated by state-appointed judge) | All (moderated by state-appointed judge); only intervenors could speak |

uncompensated landowners. Compensated landowners were more likely to attend a meeting, perceive the community as having a say in and able to influence the outcome of the project, and perceive the developer as open and transparent when compared to non-compensated landowners. While compensated landowners in the case of Bent Tree Wind reported that they attended a meeting at a higher frequency than non-compensated landowners, they did not necessarily view the planning process more favorably. For some questions, like whether the

community was able to influence the outcome of the planning process, compensated landowners are polarized in their response. Results for Bent Tree Wind are, however, limited by a small sample size.

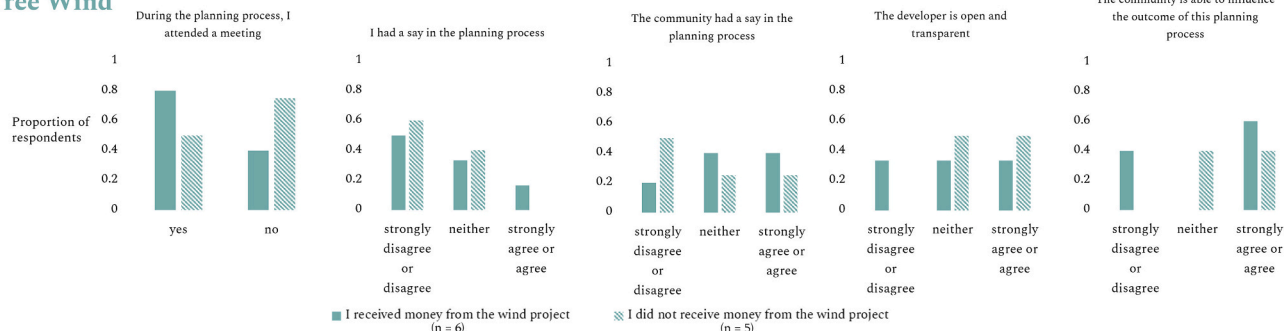
The timing of engagement also varied between Blue Creek and Bent Tree. With Blue Creek, a public information meeting occurred before the developer applied, while with Bent Tree, the public meeting occurred after an application was submitted to site a wind farm. This timing difference is reflected in the survey responses, where 73% of Blue Creek respondents reported hearing about the wind farm before or when it was announced compared to only 25% of Bent Tree respondents. The procedural justice guideline of early community engagement [5,14,26], then, was not met in the case of Bent Tree and was addressed in a limited way (using a single, developer-moderated meeting) in the case of Blue Creek.

4.3. Information

In both Bent Tree and Blue Creek wind farms, access to information was mediated by the state permitting agency or by the developer. Information was important in two respects in these cases – first, in the way that information was provided to the public, and second, in how information was provided to local officials.

For the public, access to information was limited by the number and structure of in-person participation opportunities and mailed notices. Beyond public participation meetings, the developer in the case of Blue Creek wind farm had an on-site office that was staffed 2 days per week (a detail provided by a representative of the developer in interviews) as well as a project website that was accessible from the application to the construction period. In the case of Bent Tree, there were no additional sources of information beyond the meeting and the mailed notices – that

Bent Tree Wind



Blue Creek Wind

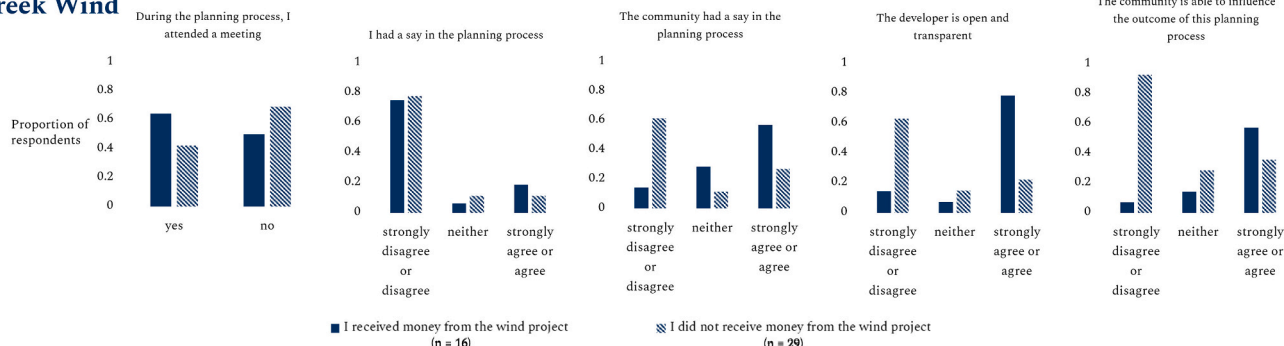


Fig. 3. Experiences and perceptions of the planning process as reported in PAWES by compensated and non-compensated residents for Bent Tree and Blue Creek wind farms. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

is, the developer did not establish an on-site office or a website (a detail confirmed by the local and state officials interviewed). Local officials in the case of Bent Tree characterized the public as turning to the internet for information, which in turn placed a burden on local officials to address concerns and potential misinformation. The necessity of accessible information in planning processes [5,23,31] is compromised, then, by the lack of availability of the developer in the case of Bent Tree wind farm. Developer availability in multiple forms is needed – through public meetings, but also through active dissemination of information through websites and an in-person presence. Unfortunately, the PAWES survey did not ask questions specific to how respondents received information about the wind farm, so we were not able to triangulate interviewee perceptions of information provision with the perceptions of neighbors of the wind farms.

Gaps in information were not only evident with respect to the public, but also with respect to local officials. Local (county and township) governments were tasked in both Blue Creek and Bent Tree wind farms with negotiating land use, road use, and community compensation and investment; in the case of Bent Tree wind farm, the state permitting agency was also involved in these negotiations. In addition, county staff in the Bent Tree wind project area also permitted a transmission line. Both Blue Creek and Bent Tree wind farms were the first wind farms permitted in their respective counties, and in both cases local elected officials and staff referred to the permitting process as a “learning process” in which they were under-resourced. Officials in the Bent Tree area, particularly, reported being “caught off guard” by the wind farm and the scope of work for which they were responsible. When asked who their key source of information was, local officials in both regions pointed to the developer as the actor that helped them navigate agreement negotiation and permitting processes. Both cases showed an information asymmetry in negotiations, with county staff and elected officials reporting a reliance on the developer (with whom they are negotiating) for information about the process. The consideration to reduce asymmetry through the use of neutral intermediaries [33] was, therefore, not met in either case.

This gap and asymmetry in information is particularly important

considering that these negotiations partially determine the socio-economic benefits of a project to a community; a local government with more information and legal resources can ensure that the benefits of a wind farm are realized for a community. Interviewees pointed to knowledge-sharing between counties through rural energy boards and farm bureau federations as ways to address the limited and asymmetric information provided to local government.

4.4. Decision-making

Decision-making for Bent Tree and Blue Creek wind farms are analyzed with respect to the involvement of the public and local officials in the decision to approve the wind farm, as well as with respect to the procedural justice guideline of “ongoing consent” [5,21,24]. We find that the decision-making process is not participatory and subject to diverging perceptions, and that the application of ongoing decision-making after a wind farm is approved is non-existent despite the presence of legitimate concerns and shifts in local knowledge, reflected in survey responses, that arose for residents post-approval.

In the planning processes for Blue Creek and Bent Tree wind farm, a decision was made by the OPSB or MPUC respectively based on staff recommendations following an adjudicatory hearing in which members of the public could speak as intervenors (in the case of Blue Creek, they could speak only if registered as intervenors). This decision-making process documents and makes publicly available the concerns and opinions of the public, but ultimately leaves decision-making authority to the state. Further, the requirement to register as an intervenor (as was the case in Blue Creek) to be heard is likely to exclude some voices from decision-making processes.

“Participatory” decision-making about wind farm siting – in which the decision-making process results from a partnership between actors, or assigns power or control to the public [32] – is rare in the United States [8,15], so it is unsurprising that the public had limited decision-making power over project approval for Blue Creek and Bent Tree wind farms. This limited decision-making power is reflected in both PAWES and interview responses. As Fig. 3 shows, both compensated and

uncompensated survey respondents largely disagreed or strongly disagreed that they had a say in the planning process. In Blue Creek, particularly, officials consistently characterized the conclusion of private land-leasing meetings, which occurred before the developer had even applied, as the key decision point: “after the leases are signed, it’s a done deal,” one official stated. Still, state officials and the developer had a diverging perception of local influence over decisions, citing public hearings, public comments, and negotiation meetings as places where both the public and local officials could exert significant influence.

This divergence in perception may be explained by Simcock’s (2016) observation that differences in normative expectations of justice and experiences of the planning process can lead to different perceptions of procedural justice [21]. But the consistent perception that the public cannot influence or “have a say” in planning expressed by neighbors of the project and interviewees also reveals the inadequacy and indirectness of current methods of incorporating the public in decision-making points. From the perspective of the developer and the state agency, the mandated public consultation activities were offered, and therefore the public was afforded opportunities to exert influence. For the public and local officials on the other hand, those mandated opportunities were merely procedural and lacked decision-making influence. Ultimately, the state agency can approve a wind project regardless of the nature of comments provided in adjudicatory hearing.

Critical scholarship on decision-making and procedural justice emphasize that a just process should involve “ongoing opportunities for consent”, beyond a one-time decision of whether or not to permit a facility [24]. Analyzing the planning process for Blue Creek and Bent Tree wind farms shows that community involvement in the “one-time” decision to permit the wind farm was limited. But what does “ongoing consent” look like for a wind farm beyond the permitting decision? Mapping the planning processes (Fig. 2) shows that after a wind farm is approved, there are no public meetings and limited information provided beyond mailed notices of construction. The lack of information and opportunities for input related to construction, operation, and decommissioning are reflected in PAWES responses. Of the 27 long-answer comments received from neighbors of both projects, the greatest proportion (46%) relate primarily to construction, operation, and decommissioning (while 27% each of comments either express general sentiments about wind energy or relate specifically to siting and the pre-application process). Respondents reported concerns about noise, increasing utility bills despite their perception that a local wind farm would reduce utility bills, and decommissioning, with one respondent writing that “my fear is that they will be abandoned in the future. It is good farming land and we will have horrible rusting things sitting here with big cement holes and not be able to farm the land” and another stating that “the turbines make the ground compacted which is terrible for my husband’s farming”.

These responses demonstrate how local knowledge (like the knowledge of the impact of turbines on farming operation) and concerns (like concerns about what happens to residents’ land after a wind turbine is done operation) can shift over time. A planning process rooted in procedural justice would include decision-making (as well as participation and information-provision) structures that are responsive to new information [5,21,24]. Doing so would require project developers to go beyond the typical state-led siting requirements and adopt participation and decision-making opportunities more aligned with a “consult-consider-modify-proceed” process [15,45].

4.5. Local context

The local context of the regions that host Blue Creek and Bent Tree wind farms was related to planning in two ways: first, a history of power generation can inform how counties make decisions and address concerns, and second, the type of connection that a resident has with the landscape can impact their perceptions of the wind project and engagement with the planning process.

Wind siting literature suggests that participation processes should consider the extent of communities’ existing relationship with developer and with wind development [21]. The theme of existing relationships with wind development came up in the interviews in the context of the role of local government in negotiating community benefits (as discussed in more detail in Section 2.2.2). Notably, officials in the Bent Tree area were in the process of permitting their second wind farm as interviews for this paper were being conducted and pointed to the Bent Tree process as a key resource for navigating the planning process for their second wind farm. In the case of Blue Creek wind farm, one interviewee argued that if a county has permitted a wind farm before, or even another form of power generation, county officials have a “history to rely upon to help them make decisions and address concerns”. Procedural justice requirements surrounding information, then, are particularly important in regions without a history of power generation or wind farm siting.

Interviewees also discussed the planning process in the context of residents’ connections to the landscape. In the case of Blue Creek wind farm, one interviewee characterized rural residents who tend to support wind farms as “folks [who have] been in the community 3 generations or more...if that sounds like a farmer in the community, I think it very much is”, while those who oppose wind farms have a “job or economic livelihood [that] is an average of a 20 min drive away from there”. Similarly, multiple interviewees in the Bent Tree project areas pointed to small property owners who worked in one of the municipalities in Freeborn County as the key demographic in opposition to Bent Tree Wind. Although PAWES did not include detailed questions about place attachment, property size, or profession, these interviewee observations echo the broader wind and land-use literature, which find that place identity and cultural connection to landscape is an indicator of support or opposition [2,10,38,39]. In terms of implications for process, the role of place attachment and identity should be considered when thinking about engaging the public. Processes should acknowledge the needs of distinct “communities” (e.g., communities of practice, communities of place), as opposed to a set of people with uniform interests [26]. Information, participation opportunities, and decision-making should seek to address community-specific concerns, which will vary based on resident livelihoods, property types, and landscape.

4.6. Discussion

Analyzing the planning processes of Bent Tree and Blue Creek wind farms using the analytical themes summarized in Section 2.2. reveals that procedural injustices in state-led wind project planning processes can be attributed both to structural factors of planning regulations as well as to the implementation of the process by developers. Several suggestions for wind farm planning processes to better enable procedural justice emerged from this work; these suggestions are summarized in Table 3.

Assessing participation showed that the public had limited meaningful opportunities for participation, but compensated landowners had earlier, more meaningful access to the developer and more positive perceptions of the planning process. Early participation opportunities were particularly limited for the general (i.e., non-compensated) public – in Bent Tree, the public was not invited to participate until after the developer had applied for a permit. The limited opportunities for meaningful engagement and participation are structurally engrained in the state-governed planning processes for both states we examined. In Minnesota, for example, only one in-person public meeting is mandated. To address these deficiencies in participation, structural or regulatory changes could be made by permitting agencies to create space for more frequent and earlier meetings with more deliberative modes of facilitation. At the same time, it was clear from the mapping of these two processes that project developers have significant leeway in their implementation of planning processes. Developers could, for example, go beyond the minimum requirements for public participation and

Table 3
Summary of wind farm planning process suggestions, arranged by analytical theme.

| Aspect of a wind farm planning process | Process suggestions to enable procedural justice |
|--|---|
| Participation | <ul style="list-style-type: none"> Permitting agency should implement earlier opportunities for public involvement Developer should create space for more frequent and earlier meetings beyond minimum regulatory requirements Meetings should employ different modes of facilitation (i.e. not always facilitated by developer or state) General public should be engaged at the same time as compensated landowners |
| Information | <ul style="list-style-type: none"> Developer and information should be accessible to public beyond mandated participation opportunities Government at all levels should support knowledge-sharing among local governments, coordinate with existing knowledge-sharing organizations, and provide more legal resources for counties on their scope of work and navigating negotiations, particularly for counties that are under-resourced Trusted, neutral intermediaries should provide information so that developers are not the primary information source |
| Decision-making | <ul style="list-style-type: none"> Permitting agency should promote more participatory decision-making by moving beyond adjudicatory hearing model to decision-making models based on bi-directional communication Wind planning processes should incorporate decision-making, participation, and information opportunities post-project approval encompassing construction, operation, and decommissioning Project developers can go beyond the minimum regulatory requirements to design a “consult-consider-modify-proceed” process |
| Local context | <ul style="list-style-type: none"> Provide additional information and legal resources about project permitting and negotiations for counties or townships without a history of power permitting Create participation opportunities and resources that address resident concerns in relation to livelihood, landscape, and property/ownership types |

thereby improve procedural justice, even where structural limitations to fairness exist.

Linked to the relative lack of participation opportunities was the limited nature of information provided to the public throughout the planning processes. Expanding the forms of information provided beyond just uni-directional communication at public meetings – through websites, on-site developer offices, or neutral intermediaries, for instance – can begin to address information limitations in planning processes. As our discussion of local context shows, the information needed for informed participation of community members can vary based on livelihoods, property types, and landscape, and the information provided to fill in knowledge gaps should address the specific context of the region in which a wind farm is proposed.

This paper's discussion of information also extended to the use of and availability of information to local elected officials and staff. While negotiations between local government and developers impact the type of and level of socio-economic benefits from a wind project that are delivered to a community, local governments found themselves under-resourced and dependent on the developer for information in both planning processes. Support for and expansion of rural knowledge-sharing organizations can start to address this knowledge gap and asymmetry.

Analyzing the role of information in the planning processes with respect to local context additionally indicated that counties or townships without a history of wind development may require additional legal and information resources about their scope of work. Beyond the local context of experience with similar planning processes, our interview

responses suggested that community-specific concerns, which are tied to livelihood, landscape, and property tenure, can be better integrated into participation opportunities and resources made available.

Analyzing decision-making showed that both Blue Creek and Bent Tree wind farms offered limited opportunities for participatory decision-making, mirroring the “decide-announce-defend” model and reinforcing calls in the literature for more publicly deliberative processes of wind project siting decision-making [8,15]. The pervasive public perceptions that community members did not “have a say” in the process and that a project's approval was a *fait accompli* once “the leases are signed” are clear illustrations of procedural injustice, which stem from both regulatory structures and the developers' implementation.

Beyond the siting decision, however, survey responses also point to resident concerns surrounding wind farm construction, operation, and decommissioning. A dynamic decision-making process should include structures for information, participation opportunities, and adaptation to respond to the shifting concerns and local knowledge that come with the construction of a wind farm.

5. Conclusion

Increasing interaction between communities and utility-scale wind development [1] as well as the established links between perceptions of process fairness and attitudes towards wind projects [2–5] necessitate more research on wind farm planning processes. Improving procedural justice in wind energy planning is also a central tenet of a more just energy transition [46]. Despite the established importance of process, however, there are still few studies that investigate in detail the process by which a wind project is planned and fewer still that uncover the factors that make those processes more or less fair.

We identified four analytical themes for investigating fairness in wind farm planning processes – participation, information, decision-making, and local context – and analyzed Blue Creek and Bent Tree wind farms using a mixed-methods case study methodology through these four analytical themes. Our findings confirm other results in the wind planning literature, particularly with respect to the limited opportunities for participation and decision-making input afforded to the public. Our findings also indicate areas for future research, particularly research that explores the relationship between procedural justice and historic energy development in a given region. Our study was limited by a small set of cases that studied one form of wind project approval in the United States – approval at the state level. Within the United States alone, wind farm planning processes differ with respect to whether state or county agencies have decision-making authority [19]; future research could complement this study by looking at more local models of wind farm approval, which has received limited attention in a US context [8].

We also contribute to the literature in the following ways. First, we demonstrate that procedural injustices in wind project planning are both structural and implementational. Second, we argue that compensated landowners are afforded more information and opportunities to voice concerns than non-compensated landowners, and that participation processes should evolve to allow non-compensated residents similar access to information and influence. Third, we contextualize calls for more local government involvement in wind project planning [8] by showing how resources, knowledge-sharing, and information will need to evolve to accommodate under-resourced counties and counties permitting wind facilities for the first time. Fourth, we build on the requirement for ongoing, dynamic, responsive decision-making found in STS and environmental planning literature [5,21,24] to argue for the creation of participation, information provision, and decision-making structures that respond to resident concerns about wind farm construction, operation, and decommissioning – even after a project is built and operating. Finally, we link discussions of local context – which are not typically discussed in relation to the planning process – to planning process considerations, arguing that information provision and participation processes should consider both histories of wind development

and resident connections to the land through their livelihoods and properties.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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