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Opposition "overblown"? Community response to wind energy siting in the Western United States[1]

Leanne S. Giordono[a,*], Hilary S. Boudet[a], Anna Karmazina[a], Casey L. Taylor[b], Brent S. Steel[a]

[a] Oregon State University, School of Public Policy, 300 Bexell Hall, Corvallis, OR 97331, United States
[b] Idaho State University, Department of Political Science, Campus Box 8073, Pocatello, ID 83209, United States

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ABSTRACT

Much of the literature on local opposition to wind development is based on small-N case studies of controversial cases. This focus has led to an emphasis on the so-called "social gap" between positive general attitudes toward renewable energy development and local resistance to actual proposals. Instead, we conduct a fuzzy set/Qualitative Comparative Analysis of 53 proposals for wind energy development in the Western United States to better understand both the amount of local opposition *and* the factors and processes that shape it. We find that while some level of local opposition to wind proposals is not rare, it is typically restricted to more benign activities that require few resources and take place in standard institutional settings. Drawing on insights from the literatures on social acceptance of wind and social movement studies, we show that proximity to protected areas, political opportunity, and opponents' framing of the risks posed by wind development are important factors in driving community resistance. These findings suggest that resistance to wind energy proposals is more likely to be shaped by existing processes for public participation than to shape them, and that calls to streamline regulatory processes to expedite development due to local resistance may be premature.

1. Introduction

Wind power is the U.S.'s largest non-hydro renewable energy source and has recently experienced rapid growth, from 16,765 MW in cumulative capacity in 2007 to 88,973 MW in cumulative capacity in 2017 [2] – a trend which is expected to continue [3,4]. Wind energy development also enjoys support among 75–90% of the public, according to surveys in the United States (U.S.) and United Kingdom [5–7]. Despite broad public support, however, concrete proposals for large-scale wind energy facilities sometimes meet local resistance [5,8,9]. Scholars have deemed this divide the 'social gap': people have positive attitudes toward renewable energy development (including wind power) in general, as expressed in opinion surveys, but resist local proposals [6]. Scholars have substantially examined this 'gap' by using U.S., European, Canadian, and New Zealand empirical data [5,6,10–15]. And, while the 'not in my backyard' (NIMBY) label has previously been applied to local opposition to wind farms, scholars have since moved away from this characterization, considering it overly simplistic with limited explanatory power [6,16–19].

Yet, as Rand and Hoen [19] point out in their recent review of North American wind energy acceptance research: "the vast majority of North American studies focus on only one or a few locations or wind facilities, so results cannot be generalized to the wider population living near wind turbines," (138) or those communities located near wind turbine *proposals*, we would add. In fact, scholars usually select some of the most contentious proposals for analysis (e.g., [20–22]) – selecting on the dependent variable of opposition, as opposed to communities "at risk" for mobilization. Thus, we cannot determine either the amount of opposition typically experienced by a wind energy proposal *or* if the factors that have previously been identified as important for opposition were also present in other locations that did not experience opposition. Rand and Hoen [19] advocate for standardized protocols across cases to allow for more comparability. Such an approach is exactly what we take here. Drawing on insights from the disparate literatures on social acceptance of wind and social movement studies, we conduct a fuzzy set/Qualitative Comparative Analysis of community response to 53 proposals for wind energy development in California, Idaho, Oregon and Washington to better understand (1) the level of opposition to proposed wind energy projects, and (2) the factors and processes that shape opposition across a wide range of proposals in the Western U.S.

* Corresponding author.
E-mail addresses: giordonl@oregonstate.edu (L.S. Giordono), hilary.boudge@oregonstate.edu (H.S. Boudet), karmazia@oregonstate.edu (A. Karmazina), taylcas3@isu.edu (C.L. Taylor), brent.steel@oregonstate.edu (B.S. Steel).

[1] Our title was inspired by a recent article in the on-line, independent news source "The Conversation" by Firestone, Hoen and Rand [1]. That article, which can be found at https://theconversation.com/are-public-objections-to-wind-farms-overblown-95728, provides a timely clue about selected findings of our own research.

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1.1. Justification for focus on Western U.S

The U.S. currently represents 17% of global installed wind energy capacity, second only to China [23]. And in 2017, the U.S. installed 13% of new wind power capacity, again second only to China [24]. Such rapid growth in onshore wind energy development may mean, as suggested by the U.S. Department of Energy's recent *Wind Vision Report*, that the easiest sites for wind development – those proximate to loads and transmissions, sufficient wind resources, and distant from communities – are taken. Given the expected continued growth in the industry, research is needed to understand the drivers of opposition to such development.

The U.S. context also provides an interesting contrast to Europe – where a large body of literature has developed on social acceptance of wind [25]. With large, relatively cheap domestic reserves of fossil fuels and wavering political support for national climate policies that would promote renewable energy development, wind energy development in the U.S. faces a much different market and political landscape than in Europe [19]. Moreover, models of development that have been shown to correlate with higher levels of support – like community ownership and investment models – are less prevalent in the U.S. due to federal incentives that privilege large private developers [19,26].

Four states are included in this study: California, Oregon, Idaho and Washington. As Steel et al. [27] document, the Governors of California, Oregon and Washington and the Premier of British Columbia, launched a broadly announced public commitment to reduce greenhouse gas emissions through multiple strategies, including the 2003 West Coast Governors' Global Warming Initiative and the follow-up 2013 Pacific Coast Action Plan on Climate and Energy. These interstate agreements included the promotion and development of renewable energy sources. The initiatives also recognized that citizens are both a central component to abating greenhouse gas emissions with regard to energy behaviors, and are important participants in the public policymaking process including the siting processes for wind farms and other renewable technologies. Moreover, these three states are host to numerous wind farm controversies. Likewise, each state has a long history of pro-environmental policies; each has spawned major home-grown environmental movements; and, each state has extensive experience with both carbon-based and non-carbon-based (such as hydroelectric) energy production for the power grid. Therefore, these three states offer fertile ground for examining wind farm siting processes and community response. We also include Idaho as a control comparison due to its western geographical location bordering Oregon and Washington, its historically more conservative political culture, its relative lack of policies promoting renewable energy technologies, and its non-signatory participation in the coastal states' action plan. Politically, three of our included states lean Democrat and Idaho leans Republican. However, our three Democratic-leaning states have both large liberal cities driving renewable energy policy (like the Northeast) *and* very conservative rural areas (like the South). Therefore, our results should be of interest to policymakers and scholars in other areas of the country and other areas of the world with similar urban/rural divides.

2. Relevant literature

2.1. Social acceptance of wind energy development

Scholars have paid significant attention to factors that influence negative or positive attitudes toward proposed wind energy projects. In an attempt to move beyond simplistic NIMBY explanations of opposition, Devine-Wright [16] underlines the complexity of factors that shape public perceptions of wind energy development, including physical, contextual, political, socio-economic, and personal aspects. Scholars have worked to build "a more nuanced understanding of public attitudes and motivations regarding the development of wind energy and other renewables" ([5]: 190). Rand and Hoen [19] summarize this more nuanced understanding as it relates to wind energy acceptance through the identification of six overarching themes in the literature: (1) socioeconomic aspects; (2) sound annoyance and health risk perceptions; (3) visual/landscape aspects, annoyance and place attachment; (4) environmental concerns and attitudes; (5) perception of planning process, fairness and trust; and (6) distance from turbines. This list parallels Petrova's [18] VESPA framework for community concerns: visual/landscape, environmental, socioeconomic and procedural.

And, while no overarching theoretical framework exists for explaining attitudes toward wind energy development, existing research highlights two factors quite extensively: distributional and procedural justice [28]. Distributional justice considers the allocation of the risks and benefits of proposed wind energy projects. Such risks and benefits are often experienced differentially depending on proximity to the proposed project. For example, the creation of new local jobs and tax revenues are often touted by developers and supporters as local benefits of wind development, and associated low-carbon energy production to mitigate climate change is also considered a global benefit. In contrast, many risks – like disturbance during turbine operation, visual and noise pollution, wildlife threats, public health and safety issues, and decreasing property values – are concentrated locally [16,29,30–32].

Procedural justice refers to the fairness and transparency of the decision-making process and stakeholder trust in regulators and the industry to act responsibly. Whether decisions are made in an unbiased manner and whether stakeholders have the ability to influence the outcome affects attitudes toward the development process and ultimately the proposal itself [5,33]. A growing body of literature (e.g., [11,13,26,34,35]; see also [36] in this special issue) suggests that collaborative and participatory siting processes from the project's earliest stage (even before a site is chosen) improve siting outcomes for all stakeholders.

In the U.S. context, most decisions about wind energy development are made by a combination of state and local actors [26,37]. Federal government involvement is only required if a proposal is slated for public lands, requires a federal permit, and/or the federal government is funding project development. Thus, decision-making procedures can vary widely by case, though often involve some sort of environmental assessment and an associated public comment process.

Finally, contextual factors often shape how community members perceive the risks and benefits of proposed projects [38]. Devine-Wright [39] conceives of local opposition to energy development as "place-protective action" that results from perceived disruptions of pre-existing emotional attachments to specific places and the identities derived from keeping these places as they are. Moreover, Krause et al. [40] argue that the actual experience of people with wind turbines may play a role with regard to community acceptance of subsequent wind energy proposals, showing that a population's past exposure to wind turbines moderates the general decrease in support for siting a wind energy facility nearby. In other words, site-specific contextual factors play a significant role in shaping risk/benefit perceptions and ultimately attitudes toward wind energy development.

2.2. Community response to energy facility siting

Studies on public opinion toward wind energy development provide important insights in terms of the factors that shape attitudes toward wind development, specifically considerations of distributional and procedural justice. At the same time, the existing literature predominantly focuses on explaining *attitudes* and sometimes self-reported actions (utilizing surveys) and not actual *community response* (e.g. [40–42]). Yet, we know from Walter [43] that general attitudes toward and local acceptance of wind energy do not appear to predict intentions to act. Insights from the study of social movements, which have increasingly been applied to understand local episodes of contention related to facility siting can help fill this gap [38,44–55].