



Public estimates of support for offshore wind energy: False consensus, pluralistic ignorance, and partisan effects



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ABSTRACT

Meeting future energy demands will require large-scale implementation of renewable energy projects. If one of these energy sources—offshore wind—becomes a common sight off coastlines, consideration of local public opinion and action will be critical. Previous research from the social sciences has lacked depth in examining the underlying factors that shape public opinion towards offshore wind development. The current research brings a new perspective to the literature by showing that how members of the public perceive support among others relates to their own opinions of offshore wind energy. We report results from two surveys. The first focused on opinion formation relating to offshore wind in general among New England residents, while the second focused on a specific offshore wind project in Rhode Island. We find evidence that both supporters and opponents of offshore wind underestimate levels of support among others, indicating a pluralistic ignorance effect and false consensus effect, respectively. We also find distinct patterns of perceived support among self-identified Republicans and Democrats. The findings hold important implications for policymakers and developers in understanding the nature of public support and opposition for offshore wind energy, particularly with respect to individuals' willingness to publicly engage with offshore wind projects.

1. Introduction

Many argue that offshore wind has been guaranteed a place in the future energy portfolio of both developed and developing nations, including the United States. While countries around the world have started to follow Europe's vigorous adoption of offshore wind, the United States has been slow to play catch up. The first offshore wind demonstration project, the Block Island Wind Farm, was only completed in late 2016. This 30-megawatt, 5-turbine project is located off the coast of Block Island, an island 21 km off the coast of Rhode Island. This first project, in combination with many federal and statewide renewable energy goals, may be the catalyst many have waited for to jumpstart offshore wind development in the US. Indeed, academic researchers, developers, and politicians have suggested that commercial offshore wind farms may soon be a common sight in U.S. waters, particularly in the Northeast (DOE and DOI, 2016). Before this can happen, however, both technical and social barriers to offshore wind development must be overcome, and it is clear that the latter challenges are not insignificant. Understanding how various actors—including developers, policymakers, various stakeholder groups, and the affected public—view these projects will determine the rate of development as well as

the long-term success of this technology, regardless of the technical advances that are already being made (e.g., Wüstenhagen et al., 2007).

For several years, researchers and polling organizations alike have tracked public opinion regarding various types of renewable energy projects (Gallup, n.d.). Much of these data are argued to be superficial in nature (Klick and Smith, 2010). More recently, social scientists have set their sights on understanding the human dimensions of offshore wind (Firestone and Kempton, 2007; Wiersma and Devine-Wright, 2014). What has emerged is a literature rich with data that describes the public's opinion of offshore wind. The 'social gap' and 'individual gap' that emerge when high levels of broad support for offshore wind turns into low success of project implementation and local opposition has been one of the main foci of research (Bell et al., 2005, 2013). The other is attempting to more thoroughly explain this opposition and determine the true meaning of the term 'NIMBY' ('Not in my Backyard') in this context (Devine-Wright, 2005). However, little research has focused on the underlying psychological and social factors that shape these opinions, with the majority of extant work providing only descriptive insights rather than deeper empirical analyses of the drivers of public opinion on this issue.

The present research advances our understanding of public opinion

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regarding offshore wind by examining how *perceptions of other individuals'* support or opposition for such projects relates to one's own attitudes (and actions) towards offshore wind projects. Specifically, we show there exists a relationship between one's own opinion of offshore wind and one's perceptions of support among others, and that these perceptions are often incorrect.

2. Background and literature review

2.1. Public opinion of offshore wind

In recent years, a combination of technological advancements and increased incentives has lowered the price of offshore wind energy, making it a viable energy alternative for many countries (Firestone et al., 2015). Due to the economic and environmental benefits of this technology, development of wind arrays has increased, particularly in European waters. Offshore wind turbines in part aim to minimize the human impacts that have been seen with onshore wind (e.g., shadow flicker), however social concerns still play a large role in the siting and development of this technology (Haggett, 2011, 2008; Horbaty et al., 2012). These concerns stem from similar factors to those of onshore wind turbines (e.g., relationships with developers; Haggett, 2011), as well as unique factors (e.g., marine spatial planning; Wiersma and Devine-Wright, 2014). Surveys aiming to capture public attitudes have estimated that roughly 80–90% of people support the general idea of offshore wind (Bell et al., 2013; Funk and Kennedy, 2016). However, public perceptions of wind energy, in general, fall victim to the 'individual gap', where an individual's general support turns to opposition once a project is proposed locally (Bell et al., 2005). Relatedly (although importantly unique), the 'social gap' is used to explain low success rates of project implementation despite widespread public support. Although opposition is typically greater in local contexts, opponents still (usually) make up the minority. This gap can result in fierce local opposition in the form of organized protest, particularly in the face of the 'silent majority' of supporters (Swofford and Slattery, 2010). The actual influence of public opposition on project success has been debated. Whereas some argue the public can only delay a project (Aitken et al., 2008), others argue that projects can be directly thwarted through organized oppositional groups (Devine-Wright, 2010; Toke, 2005).

The term 'NIMBY' ('Not in my Backyard') is commonly used as a blanket term by developers, the media, and other members of the public to describe individuals who oppose proposed projects (e.g., offshore wind development), without regard to the reason for opposition (Ellis et al., 2007). Opponents are mistakenly seen as deviant (Aitken, 2010) and knowledge-deficient (Burningham et al., 2015). In actuality, opponents are usually well informed on details of the proposed project (Bush and Hoagland, 2016). The vast majority of social scientists publishing on the topic have disagreed with the use of the term NIMBY, and have questioned the existence of NIMBYs within the public sphere (e.g., Wolsink, 2000). Several alternative frameworks for considering public opinions have been proposed that include considering the public as rational actors with legitimate, multi-dimensional opinions and concerns (Devine-Wright, 2005; Petrova, 2016).

The term NIMBY was initially the only explanation used to explain the 'individual gap', however research has revealed that opposition among individuals is more nuanced (Bell et al., 2013). Descriptively, the most commonly cited reasons for opposition to offshore wind projects include aesthetic impacts, harm to wildlife, and impacts to recreation and the fishing industry (Firestone and Kempton, 2007). In assessing what underlies these concerns, the majority of research addressing alternatives to the NIMBY framework has focused more on explaining the 'social gap' than the 'individual gap' (Bell et al., 2013). Much of the research to date has assigned project success or failure as the outcome variable, rather than focusing on the attitudes or actions of individuals involved in the development process. Of the human-focused

and more psychological studies conducted to date, personal values, distance from the project, place attachment, and fairness of process and trust have been found to influence individual opinion. We briefly outline these below.

2.1.1. Personal values

Altruistic values have been associated with higher expectations for a wind project to provide positive economic benefits for a community, while more traditional values are correlated with pessimism regarding these impacts (Bidwell, 2017, 2013). The role of environmental values is conflicting both between and within individuals, as potential wildlife harm may influence opposition while supporters may value improved environmental quality (e.g., Warren and Birnie, 2009).

2.1.2. Distance from the project

For onshore wind turbines, there are mixed findings on an individual's physical proximity to a turbine and opinions of wind energy (Swofford and Slattery, 2010; Graham et al., 2009). van der Horst (2007) argues that proximity to proposed turbines may influence negative opinions, but there is little association between opinions and proximity to actual turbines. By moving turbines offshore, many individuals will face significant decreases in proximity to turbines, however aesthetics are still a concern. Bishop and Miller (2007) find that opinions of a hypothetical wind project are most supported when they are very far from shore, or 'out of sight, out of mind'.

2.1.3. Place attachment

Many individuals feel positively toward large bodies of water, particularly those who are only occasional visitors, finding them 'sacred', beautiful, and restorative (Devine-Wright, 2009; Gee, 2010). For those with strong place-related identity and positive attachment to an area, changes to the landscape can result in resistance and disapproval (e.g., Ladenburg, 2010). Attachment to place can be particularly influential in opinion formation of offshore wind turbines when the 'fit' of the landscape matches or is discrepant with the project. For instance, in more industrial settings, wind turbines are met with less resistance than when they are placed in more natural, serene areas (Devine-Wright and Howes, 2010).

2.1.4. Fairness of process and trust

Planned projects lacking in public engagement are often met with backlash, as citizens can perceive project decision-makers to be untrustworthy (Firestone et al., 2012). Wüstenhagen et al. (2007) argue that perceived justice of the process and outcomes are greatly influenced by community and individual trust of outside developers. Huijts et al. (2012) give a more nuanced explanation, and note that trust impacts affect, which then determines perceived fairness of process and project acceptance. In general, projects that relay benefits and minimize impacts to affected communities and those that engage with local decision-makers throughout planning and development are met with the most acceptance (Gross, 2007).

Although extant work on this topic provides important insight into public opinion towards offshore wind technology, largely missing is a theoretically-informed examination of more interpersonal and social factors that are known to shape opinion formation on other controversial topics. In particular, there is a need to better understand how normative beliefs regarding offshore wind potentially influence individuals' opinions and actions. Moreover, given the role that vocal public opposition has played historically in this domain, understanding how such factors relate to individuals' support or opposition is critically important.

2.2. Incorrectly estimating others' opinions

Humans are inherently social creatures. Marketing and social science research has demonstrated that communication of descriptive and

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