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Public acceptance of offshore wind power: does perceived fairness of process matter?

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This paper analyses the findings of recent mail surveys of residents living near two proposed offshore wind power projects – Cape Wind off Massachusetts and Bluewater Wind off Delaware. In 2009, 57% supported Cape Wind, while 80% supported Bluewater Wind. To measure the relationship between perceptions of public process and substantive support or opposition, we assessed opinions of procedural fairness, local community voice and trust in developers. A plurality of residents in both cases is relatively satisfied with the process, while statistical modelling suggests that satisfaction with the process and outcome may be mutually reinforcing or jointly determined.

Keywords: offshore wind; public opinion; procedural justice; transparency; fairness

1. Introduction

The coastal waters of the United States are rich in wind resources (Kempton *et al.* 2007). Yet, as of early 2012, no domestic offshore wind project had been built in the US even though the first project was proposed in 2001 (Cape Wind), a second project obtained a power purchase agreement (PPA) in 2008 (Bluewater Wind), and the federal government established a regulatory regime in 2005. Here, we use survey data to shed light on the public's view of the planning processes for offshore wind in the US.

In 2005 and 2006, we surveyed residents of Cape Cod, Massachusetts, and Delaware, respectively, regarding their preferences, perceptions and attitudes towards offshore wind power. In 2009, we elicited residents' opinions in both locations again to measure potential changes in opinions and to compare these two case studies as the projects (Cape Wind in Cape Cod and Bluewater Wind in Delaware) move through the development process (Firestone *et al.* 2012). Understanding public attitudes towards these two projects and their related public processes will provide insight into issues that may arise as the offshore wind industry looks to expand into other areas of the US, including off the coasts of Maryland, New Jersey, Ohio and Rhode Island, each of which is presently the focus of development.

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The Cape Wind project, which is proposed to be located in Nantucket Sound, is set to place up to 130 turbines approximately 9.5 km off Hyannis Port, on Cape Cod, 14.4 km off the Island of Martha's Vineyard, and 21 km off Nantucket Island. In 2001, Cape Wind Associates applied for a permit from the US Army Corps of Engineers (Army Corps) to construct an offshore wind power project, and in 2002 the Corps issued a permit for construction of a meteorological tower (Minerals Management Service (MMS) 2010). Originally, the Army Corps assumed the lead federal regulatory role under Section 10 of the Rivers and Harbors Act of 1899, under which it regulates obstructions in navigable waters of the US. At the time of the 2005 mail survey, the Army Corps had released a Draft Environmental Impact Statement (DEIS) (Bureau of Ocean Energy Management (BOEM) 2012) and the project had been discussed widely on the Cape. In addition, in 2005, Congress transferred primary federal jurisdiction over the Cape Wind project and offshore wind more generally from the Army Corps to the US Department of the Interior. By the time of the second survey in 2009, a second EIS for Cape Wind had been released (BOEM 2012).

The EIS process is designed to allow input by stakeholders at various stages of the process. Stakeholders have input into the scope of the study, participate in public hearings, and have an opportunity to submit written comments on the draft EIS (BOEM 2012). Although we do not have data on the number and type of public engagements conducted by Energy Management, Inc. (aka Cape Wind Associates, LLC), Cape Wind's developer, has maintained a website (www.capewind.org) where it has archived over 100 press releases it has issued since the project's inception. Organisations supportive of and opposed to the project have supplemented these efforts to disseminate information. Beginning in 2002, the Massachusetts Technology Collaborative (MTC) conducted an extensive outreach campaign to create a neutral setting for education and the exchange of ideas between opposing stakeholders (MTC 2002). The initiative convened stakeholder meetings, presented unbiased information about the project's expected effects, and empowered participants to identify data gaps and information needed to inform decision making for the project (MTC 2002). Being limited to only a few months, however, the initiative's impact may have been limited.

Bluewater Wind intended to place as many as 150 turbines approximately 21 km off Delaware. Bluewater Wind first started developing the project in 2006 after the state legislature passed a Bill mandating that its largest regulated utility, Delmarva Power Company, seek bids on a new source of power to be located in Delaware (NRG Bluewater Wind 2010). Natural gas and coal gasification proposals were also put forward. During the two years of the evaluation process, the Delaware Public Service Commission (PSC), charged with engaging the public regarding the proposals, reported unprecedented levels of participation in hearings and workshops, as well as the receipt of thousands of letters from Delaware constituents during official comment periods (Piero 2010). The PSC conducted a transparent process that required the public disclosure and posting on its website of bid documents (with only confidential business information redacted), bid evaluations and public comments. More specifically, 3327 comments from 2826 residents were received, with 88% positively mentioning offshore wind (Piero 2010).

Residents not only commented on the choices being evaluated, but also aired their concerns about the environment, health, the larger world, roles of industry and

government, and the role the state of Delaware should have in the lives of its residents, the nation and the world (Piero 2010). Against the decade-long backdrop of battling opposition in Cape Cod, this level of public involvement had an apparent impact in Delaware; in 2008, the PSC and three other state agencies selected Bluewater Wind as the winning bidder, with a PPA resulting. Bluewater Wind held its own meetings and information sessions with stakeholders, although it is difficult to estimate the scope and effect of this particular public engagement effort (NRG Bluewater Wind 2010). Importantly, albeit inconsequentially for this survey's results, in late 2011, Bluewater Wind withdrew from the PPA due to financial constraints, although it continues to pursue a lease for the project site off Delaware.

This paper presents the 2009 mail survey findings that focus on how the government-mandated planning and decision-making processes, as well as the relationship between the project developer and local communities, affect public opinion. In a companion paper (Firestone *et al.* 2012), we consider other aspects of the 2009 survey as well as our earlier 2005 and 2006 surveys (in particular, how perceptions, attitudes and opinions have changed or solidified through time in the two areas). For additional description of the Cape Wind and Bluewater case studies, see Firestone *et al.* (2009), which compares and contrasts the case studies and provides figures depicting the project layouts.

To place our results in a wider context, we first highlight the nature of conflict regarding wind power projects in the land-use planning context and review theory on fairness, trust and procedural justice at renewable energy facilities. After discussing the survey methodology employed, we present data on perceived fairness of the planning process at each project and analyse how those perceptions affect public opinion. Ultimately, we argue that understanding the role of how the decision-making processes at wind energy projects are perceived is critical because citizens have the power to obstruct or boost development. Furthermore, we note that along with regulatory and economic policies, social considerations are likely to determine the magnitude of offshore wind energy development in the US over the next decade.

2. Wind power development, planning and procedural fairness

Land-use planning is fundamentally concerned with resolving conflicts between different types of actors, interests and values (Khan 2003). Although technically offshore wind projects fall under the conceptual umbrella of marine spatial planning (Madsen *et al.* 2011), the land use planning framework is useful for understanding the tensions that arise around offshore developments as well. Indeed, offshore wind power projects are likely to have conflict dimensions that are central to land use planning. First, proposed offshore wind projects may embody tensions between private and public interests (Bergek 2010). For example, interests of some neighbours concerned about the decline of their property values contradict the overall public interest to boost renewable energy production and have to be weighed during the planning process (Khan 2003).

Second, wind projects can be highly desirable from a national point of view and bring clear environmental benefits to the public as a whole, but create negative effects that are exclusively local in nature (Jay and Wood 2002, Khan 2003). Finally, a potential for conflict lies between the goals of economic growth and environmental protection. At the national level, offshore wind power is advocated because of its economic development and environmental benefits even though it needs the government's

financial support to be implemented. At the local level, although the economic benefit for the community can be an important driving force, local environmental effects are much more extreme and can be viewed as a threat (Khan 2003).

There are other aspects of wind power that create additional planning challenges (Walker 1995, Pasqualetti *et al.* 2002, Khan 2003). A large number of turbines have to be sited to create a significant contribution to the local or national energy mix. As a result, cumulative effects of development are large, and the planning process can quickly become overwhelming. Visual impacts may also represent a considerable concern for many community members near wind projects. Finally, offshore wind projects may be proposed to be located in areas with very high seascape preservation values, which can be a source of conflict (Christensen and Lund 1998, Khan 2003). All of these characteristics call for a well-structured and balanced planning approach in which local communities are given a voice and conflicting priorities are balanced by unbiased process facilitators.

An important aspect of public opinion regarding offshore wind comes from studies on proximity and visual disamenity these projects create. To estimate the value of this visual disamenity, Ladenburg and Dubgaard (2007, 2009) conducted a choice experiment on willingness to pay (WTP) for moving future offshore wind projects further from shore. They found that Danish residents were willing to pay approximately \$58, \$121 and \$153 per household annually in 2006\$ to develop wind projects at 12, 18 and 50 km from the shore, respectively, compared to a baseline location of 8 km (Ladenburg and Dubgaard 2007, Krueger *et al.* 2011). To estimate the external costs to Delaware residents for offshore wind development, Krueger *et al.* (2011) used a stated preference choice model. The residents were asked to choose between hypothetical wind projects at different distances from the coast (1.44, 5.7, 9.6 and 14.5 km) and the status-quo option of new fossil fuel development. The annual external cost per coastal household (\$80, \$69, \$35 and \$27 in 2006\$) at the respective distances was much greater than that per inland household (\$19, \$9, \$1 and \$0). These general trends of higher support with increased distance are also applicable to land-based wind projects, with those who live farthest from the project showing significantly stronger support (Swofford and Slattery 2010).

Another aspect of proximity – the ability to see an offshore wind project from home or during daily activities – is often said to influence a person's opinion of the project. In a 2007 Cape Wind public opinion study, Firestone and Kempton (2007) found that such variables as 'see from home' and 'see from [day-to-day] routine' lead to opposition, with ability to see the project from home being more influential (Firestone and Kempton 2007). We are not aware of studies specifically evaluating the relationship between the distance a person lives from a wind project and their feelings about the process. It is, however, plausible that with greater distance from shore, involvement in the planning process is reduced simply due to a person's limited exposure and access to hearings, public meetings, information sessions and other events meant to elicit comments.

Although visual impacts may be the most defining factor in opposition to wind projects (Khan 2003, Wolsink 2007), implementing fair, transparent and just decision making and planning processes may be a significant determining factor in success (Wolsink 2007, Aitken 2010, Ricci *et al.* 2010, Walker *et al.* 2010). Facilitating such an outcome largely depends on a developer's ability to create a positive public image of its activities and on the decision-making process that is

mandated by law and implemented by government agencies. Due to the novelty of offshore wind power in the US, facilitating trust in both developers and government institutions may be especially important. Wustenhagen *et al.* (2007) argued that trust is key in all facility siting issues, especially when facility owners and investors are community outsiders and their aims are questionable to the community. Considering that offshore wind projects tend to be large, given economies of scale and near-term above-market costs, and that community ownership is not the norm even for smaller-scale land-based wind developments in the US, fostering a trustworthy relationship between offshore wind developers and communities may be challenging.

It is argued in many quarters that creating a sense of trust and fairness is essential for generating a positive public image of wind energy developments (Upreti and Van der Horst 2004, Breukers and Wolsink 2007, Wolsink 2007, Barry *et al.* 2008, Aitken 2010). Despite a significant level of scholarly attention to the concepts of trust and fairness, however, defining these concepts can be elusive. Bellaby (2010, p. 2615) summarised the main aspects of 'trust' as "a feeling or belief that someone (or some institution) will act in your best interest". Perhaps at its most basic, trust is based on an unspoken understanding that imposes moral obligations on all of the parties involved, instilling confidence that individuals will act in a complementary, beneficial and reciprocal way (Bellaby 2010). Hardin (2001) proposed thinking of trust as a notion that implies a three-part relationship and involves at least one act and two actors: a person trusts specific institutions or individuals to perform specific actions. In the context of offshore wind energy development, trust means believing that the developer and government agencies will create a process that will give community members a say in the design and layout of a project, involve unbiased decision making and treat opponents with dignity and respect.

Trust and fairness are tightly interrelated concepts, and how the public perceives them has the power to influence the way in which the process is viewed (Aitken 2010). First empirically documented in the late 1970s, the so-called 'fair process effect' demonstrates that processes used to reach outcomes matter tremendously to citizens (MacCoun 2005, Thibaut and Walker 1975, 1978, Skitka *et al.* 2003). Procedures matter because the public believes that "fair procedures produce fair outcomes" (MacCoun 2005, p. 182). Perceiving the process as fair also can lead to a higher level of acceptance of the substantive outcome, even if it does not fully satisfy all of the stakeholders or address all of their concerns (Skitka *et al.* 2003, Frey *et al.* 2004, Gallagher *et al.* 2008, Aitken 2010). Thus, trust in a specific wind developer may lead community residents to view the project as 'fair'. Vice versa: if the wind project planning process is seen as 'fair', the trust in the planning authority and institutions will probably increase (Aitken 2010). This concept was first described by Thibaut and Walker (1975, 1978) as 'procedural justice' and is so closely related to 'procedural fairness' that some researchers use the two interchangeably (MacCoun 2005).

In general, justice is seen as a central component to a well-functioning society, where fairness is expected in human interactions (Gross 2007). Definitions of justice vary from a fairly simple notion of fairness, rightfulness and having what is deserved (CCH Macquarie 1996, Gross 2007) or the "quality of being fair and reasonable" (Oxford Dictionaries 2011) to the concepts of equality and equitable distribution of benefits (Conflict Research Consortium 1998, Gross 2007). The key principles of procedural justice include the ability to express opinions freely, to have a voice and to be heard, to fully participate in the process, to have access to adequate information, to be treated with respect, and to have an unbiased decision maker

(Tyler and Lind 1992, Maguire and Lind 2003, Gross 2007). These factors contribute to acceptance of decisions made by the authorities.

The concept of fairness can pertain to either outcome (development of a wind project) or process (consultations about the project's design or the overall decision-making procedure) (Gross 2007). Within the literature discussing renewable energy development, specific attention has been given to procedural fairness (Breukers and Wolsink 2007, Ellis *et al.* 2007, Wolsink 2007, Aitken 2010, Walker *et al.* 2010). Pilot studies show that perceptions of fairness affect how people perceive the legitimacy of the outcome and that 'fairer' processes increase acceptance of the outcome (Gross 2007). This implies that people value not only the outcomes but also the processes and the conditions that determine those outcomes (Frey *et al.* 2004). Procedural fairness is attained through the processes that "give individuals 'voice'", generating procedural utility and addressing "innate needs for aspects of self-determination such as autonomy and competence" (Frey *et al.* 2004, p. 381).

3. Methods

The design of the survey began in January 2009. After undergoing a number of iterations, the survey instrument was pilot tested in June 2009 with 67 respondents at the Delaware Division of Motor Vehicles (DMV) in New Castle, Delaware. Considering that individuals obtain driver's licenses and vehicle titles and registrations at the DMV, this location provided a representative cross-section of the population. The purpose of the pilot test was to ensure survey clarity and lack of bias as well as to gauge whether the time commitment required to complete the survey was reasonable.

The Cape Cod sample was divided into three geographic regions: those living on Martha's Vineyard and Nantucket Island ('Islands'); those living in census tracts or block groups on Cape Cod that may have a view of the project ('Sound'); and those living elsewhere on Cape Cod ('Rest of Cape Cod'). The Delaware sample was likewise divided into three strata: those living in census tracts or block groups adjacent to the Delaware Bay ('Bay'); those in census tracts or block groups on Delaware's Atlantic Coast ('Ocean'), and those Delawareans living elsewhere ('Inland'). Survey administration followed Dillman's Tailored Design Method (Dillman 2007) to the greatest extent possible.

In August and September 2009, 300 survey packets (including the survey instrument, offshore wind power project photo-simulations, and a stamped and addressed return envelope) were mailed to Islands residents, another 300 to Delaware Bay residents, and 500 to residents in each of the four remaining areas.

Given that the appearance of a wind project may affect public perception and opinion regarding that project, simulated views depicting a large 130-turbine project (designed by the firm Macro Works) were provided to survey respondents. To enhance the comparability of the responses from the Cape Cod and Delaware case studies, generic, rather than site-specific, views were employed to simulate an offshore wind project from either location, although the Delaware sample was first shown a view from 21 km, while the Cape Cod and Islands sample was shown a view from 9.5 km. We also provided survey respondents with instructions on, and an illustration depicting, how far to hold the simulation from their eyes because a simulation must be viewed at a specified distance for it to accurately depict how a wind project will appear at a particular distance from shore.

We over-sampled (i.e. included in the survey a greater number of potential respondents than would be included based on a percentage of the population) the areas closest to the proposed projects to ensure that the analysis would be based on sufficient responses to adequately characterise those who presumably will be more affected by the projects. The Islands subsample contained a large number of undeliverable addresses. To account for the resulting imbalance in this subsample, for the imbalance created by over-sampling in general, and for any demographic response bias (e.g. men responding at a greater rate than women), we weighted the data according to demographic and geographic characteristics. Consequently, each sample and subsample reflects the demographic characteristics of the geographical area from which it was drawn.

4. Results and discussion

After we asked respondents several questions about their general attitudes regarding wind energy, whether they had already heard of the specific project proposed in their area, and what effect the debate over the project had on the community, we enquired whether respondents supported, opposed or had not yet made up their mind about the project. Those who were undecided were then asked whether they were 'leaning' towards support or opposition. For Cape Wind, we find 36% supporters, 31% opponents and a surprising 33% undecided, with most of the undecided leaning towards support. Including those leaning one way or the other, 57% on Cape Cod and the Islands support the Cape Wind project compared to only 41% opposed, with 2% firmly undecided. In contrast, Delaware has substantially less opposition (9%) and more support (52%). Similar to Cape Cod, Delaware has a very high percentage (38%) who have not yet made up their mind. Including those who are leaning, 80% support the Bluewater Wind project, with only 15% opposed. The remaining 5% are firmly undecided.

The best comparator, however, might not be between the population of Cape Cod and the Islands and the broader Delaware population, but rather between those residents in each area that live near the Ocean/Sound or between those in each area that may have a view of the project from their residences. Turning first to Ocean/Sound residents, we find 77% support (initial support, plus leaning) in Delaware compared to only 46% (same) on Cape Cod. Although few respondents believe they will be able to see the respective project from their residence (27 in Delaware and 14 in Cape Cod), a striking 69% of those Delawareans support the local project compared to only 26% of those on Cape Cod. This difference in support between Delaware and Cape Cod residents who believe they will have a project view from their home is statistically significant (p value = 0.012, using a Wald test). Although the proposed Cape Cod project will be closer to the shore than the Delaware project (9.5 km from Hyannis Port versus 21 km from Rehoboth Beach), it is notable that those Delaware residents who expect to be able to see the project from their residence are more supportive than Cape Cod residents as a whole, the overwhelming majority of whom do not expect to be able to see the project. For more detail, see Firestone *et al.* 2012.).

To find possible connections between the level of current support and both a developer's conduct of planning process and the government-mandated decision-making process, the 2009 survey gave respondents three statements asking if they agreed, somewhat agreed, neither agreed nor disagreed, somewhat disagreed,

disagreed or did not know. The statements were: (1) the wind project developer, Bluewater Wind, has acted openly and transparently; (2) the planning process has been fair; and (3) local people have had a say in the planning process. We did not define or elaborate on concepts such as transparency or fairness or what it meant to have a 'say'. Rather, we left it to each respondent to define these concepts for themselves. Further, given survey length limitations, we did not provide background on the public processes that had occurred in Delaware or on the Cape, nor did we attempt to differentiate between federal and state processes or describe the sequential federal processes that Cape Wind project was subjected to.

A plurality in both areas agree that the project developer has been transparent, the process fair, and local residents have had input into the planning process, suggesting overall satisfaction (Table 1). In each case, employing a Wald test, we find that the ratio between the percentage agreeing and disagreeing is significant at the 1% level. The results are difficult to interpret because the developer of Cape Wind gets higher agreement on each measure, but also gets higher disagreement. That is, in Delaware the 'don't knows' were much higher. We interpret this as follows. A greater percentage of residents living on Cape Cod/Islands than in Delaware have a perception of the developer and the government process directly, but of those who have an opinion, the ratio of agreement to disagreement on the three metrics at the Bluewater Wind project varies from almost twice to more than three times that at Cape Wind. Therefore, of those who have formed a perception of the projects, either directly or through the media, those in Delaware indicated a comparatively higher level of transparency, fairness of process and local input.

Because the Delaware Ocean area is perhaps a better comparator to Cape Cod/Islands than is Delaware as a whole, we tabulate the Delaware Ocean area separately in Table 1 (last two columns). Those residents who live very close to the ocean, and thus may be most affected by the development should it occur, in particular agree that the Delaware developer has made a sufficient effort to ensure the accessibility of information about the project and its impacts, with more than six to one opining that Bluewater Wind has acted transparently.

Although Cape Cod/Islands residents are more opposed to the local project than are Delawareans, they are generally satisfied with the fairness and inclusiveness of the development process. Somewhat surprisingly, given the length of the debate and its coverage in the press, large percentages are unsure on the process questions (neither agree nor disagree). The positive rating may nonetheless be at least partially explained by Cape Wind's lengthy permitting process, extensive EIS preparation, and multiple public hearings and outreach campaigns conducted over the years.

Table 1. Evaluations of fairness of the planning process.

	Cape Cod & Islands		Delaware		DE Ocean	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
Developer Transparent	43%	22%	32%	7%	40%	6%
Planning Process Fair	39%	21%	29%	9%	34%	8%
Local say in Planning	43%	29%	34%	6%	39%	12%

Notes: In each case, the total of 'agree' and 'disagree' is less than 100%, and the remainder comprises those that 'neither agree nor disagree' and those that 'don't know'.

However, it is noteworthy that a relatively large portion of the Cape Cod/Islands population (22 to 29%) is not satisfied with the planning process.

In both areas a strong correlation exists between project support and positive feelings on each of the three process metrics examined, as well as between project opposition and negative feelings. For example, of those who support the Cape Wind project, a strong majority (66%) agrees that the developer has been transparent compared to only 3% who disagree. Conversely, of those who oppose the project, only 16% agree that the developer has been transparent compared to 49% who disagree. (These latter comparisons are not shown in Table 1.) Further, these positive perceptions of the planning process and the developer may have significantly contributed to the growing level of Cape Wind support.

Because most of the knowledge of the early planning process of Cape Wind is anecdotal, it is difficult to draw any definite conclusions about the fairness or transparency of the process in the beginning. As noted previously, when the Cape Wind project was first proposed, the federal government had not yet established a regulatory regime for offshore wind power due to the novelty of offshore wind development in the US. Federal environmental evaluation and permitting therefore fell to the Army Corps. The resulting generic permitting process, not devised with large offshore energy development in mind, may well have been perceived by the public as inadequate (as it ultimately was by the US Congress when it directed the US Department of the Interior to develop an offshore wind regulatory and leasing scheme). The lack of an offshore wind-specific regulatory regime thus may have contributed to an atmosphere of uncertainty and mistrust. In contrast, the Bluewater Wind project arose out of a competitive bidding process for new power that was run by the Delaware Public Service Commission and three other state agencies, where the choice facing regulators and the public was not between offshore wind power and nothing, as it was on Cape Cod/Islands, but among offshore wind, natural gas and coal gasification. Moreover, it is possible that the Delaware developer, Bluewater Wind, learned from observing the Cape Wind experience.

A discussion of process perceptions raises the question of which direction causation runs between project support and positive feelings regarding the process – that is, whether a positive view on procedural fairness results in project support or vice versa, whether procedural justice and substantive justice are mutually reinforcing or whether they are jointly determined. To test this proposition, we employed ordered logit regression.

We first re-coded the transparency, fair process and local say in decision-making variables, coding them as ‘2’ if the person agreed or somewhat agreed, ‘1’ if he or she neither agreed nor disagreed or did not know, and ‘0’ if he or she disagreed or somewhat disagreed. We then created the composite variable of those three variables – process – which ranges from 0 to 6. We also created a project support variable – outcome – that was coded ‘0’ if opposed, ‘1’ if leaning opposed, ‘2’ if not made up mind and not leaning, ‘3’ if leaning support, and ‘4’ if supportive. Separately for Cape Cod/Islands and Delaware, we then ran a series of ordered logit regressions, each employing either process or outcome as the dependent variable.

Each regression model included the following independent variables: sex, age, education (with seven categories ranging from grade school to graduate or professional degree), whether the respondent had seen an operating wind turbine before, general attitude towards wind power (five categories from very positive to very negative), whether the respondent expected to see the project from home, and

income greater than \$250,000. Rather than a continuous variable, our measure of income is based on 11 Census categories.¹ We first ran a regression with the 11-category income variable and then other transformations of the income variable. Consistent with Firestone and Kempton (2007), we found that including a dummy variable for the highest income category had the most explanatory power (in contrast to our 2007 work, the second highest income category was not significant and thus not included in the present model). We then re-ran each ordered logit regression, including process as an independent variable when the dependent variable was outcome and vice versa. The results for the Cape Wind project (models 1–4) and Bluewater Wind Project (models 5–8) are presented in Tables 2a and 2b.

Table 2a. Ordered logit regression of the relationship between perceived fairness and transparency of the process and outcome at the Cape Wind offshore wind project.

Model	<i>Dependent variable model</i>			
	1	2	3	4
	Outcome	Outcome	Process	Process
Observations	365	365	365	365
F value	11.60	13.54	7.09	12.87
Prob > F	0.0000	0.0000	0.0000	0.0000
Psuedo R ²	0.124	0.215	0.056	0.128
<i>Indep variable</i>	coefficient (<i>p</i> value)			
Outcome				0.755* (0.000)
Process		.586** (0.000)		
Sex	0.476 (0.101)	0.290 (0.322)	0.297 (0.296)	0.148 (0.602)
Age	0.017 (0.078)	0.026* (0.027)	−0.003 (0.773)	−0.010 (0.361)
Education	−0.125 (0.189)	−0.075 (0.426)	−0.121 (0.168)	−0.063 (0.491)
Income > \$250,000	−1.06* (0.038)	−0.845 (0.061)	−0.729 (0.062)	−0.396 (0.271)
Have seen wind turbine before	−0.64 (0.066)	−0.259 (0.481)	−0.449 (0.099)	−0.157 (0.566)
Attitude towards wind power	1.36** (0.000)	0.941** (0.000)	0.981** (0.000)	0.329 (0.114)
See from home	−0.001 (0.998)	−0.413 (0.317)	0.714 (0.066)	0.911* (0.011)
Intercept1	3.22** (0.000)	4.67** (0.000)	−0.044 (0.961)	−0.808 (0.425)
Intercept2	3.98** (0.000)	5.62** (0.000)	0.358 (0.693)	−0.347 (0.734)
Intercept3	4.09** (0.000)	5.76** (0.000)	1.14 (0.220)	0.623 (0.545)
Intercept4	5.31** (0.000)	7.30** (0.000)	2.04* (0.033)	1.78 (0.106)
Intercept5			2.72** (0.005)	2.58* (0.022)
Intercept6			3.47** (0.000)	3.44** (0.003)

Notes: **p* < 0.05; ***p* < 0.01.

Table 2b. Ordered logit regression of the relationship between perceived fairness and transparency of the process and outcome at the Bluewater Wind offshore wind project.

Model	<i>Dependent variable model</i>			
	5	6	7	8
	Outcome	Outcome	Process	Process
Observations	492	492	492	492
F value	8.72	7.52	3.70	4.02
Prob > F	0.0000	0.0000	0.0006	0.0001
Pseudo R ²	0.159	0.204	0.0492	0.0840
<i>Indep variable</i>	coefficient (<i>p</i> value)			
Outcome				0.651** (0.000)
Process		0.574** (0.000)		
Sex	0.341 (0.306)	0.354 (0.310)	−0.025 (0.936)	−0.075 (0.812)
Age	0.026* (0.030)	0.024* (0.035)	0.019 (0.066)	0.008 (0.369)
Education	0.140 (0.193)	−0.125 (0.239)	−0.078 (0.425)	−0.036 (0.706)
Income > \$250,000	1.73* (0.014)	1.94* (0.014)	−0.589 (0.126)	−1.07* (0.019)
Have seen wind turbine before	−0.014 (0.967)	−0.168 (0.481)	−0.340 (0.271)	0.406 (0.180)
Attitude towards wind power	1.67** (0.000)	1.48** (0.000)	0.874** (0.000)	0.440 (0.059)
See from home	−1.34 (0.085)	−1.54 (0.115)	−0.250 (0.766)	0.323 (0.731)
Intercept1	3.29** (0.000)	4.39** (0.000)	−0.673 (0.612)	−0.821 (0.502)
Intercept2	3.99** (0.000)	5.18** (0.000)	0.041 (0.973)	−0.050 (0.964)
Intercept3	4.47** (0.000)	5.70** (0.000)	1.17 (0.292)	1.18 (0.259)
Intercept4	6.49** (0.000)	7.87** (0.000)	4.95** (0.000)	4.33** (0.106)
Intercept5			4.68** (0.000)	5.00** (0.022)
Intercept6			5.26** (0.000)	5.60** (0.003)

Notes: * $p < 0.05$; ** $p < 0.01$.

Looking first at the Cape Wind project (models 1 and 3), we find that the most important predictor of project support and of overall satisfaction with the process is having a generally positive attitude towards wind energy.² Having an income greater than \$250,000 leads to project opposition (with significance at the 5% level in model 1). In contrast, no demographic variable significantly influences a person's satisfaction with the process (model 3).

Turning next to the Bluewater Wind project (models 5 and 7), we likewise find that having a generally positive attitude towards wind energy significantly predicts (at the 1% level) both project support and satisfaction with the process and that no demographic variable significantly predicts a person's overall perception of the

process. All of those relationships are the same on Cape Cod. However, whereas residents in the highest income bracket are more likely to support the project in Delaware, they are more likely to oppose it in Cape Cod. In addition, older individuals are more likely to support the Bluewater Wind project than younger ones. In Cape Cod/Islands, no significant age difference was found.

Next, we consider the relationship between one's view of the process and support or opposition to the project. Examining the outcome models (2 and 6), we find that the more a person perceives the process as just – involving fairness, a local voice and a transparent developer – the more likely they are to move from opposition to undecided to support. Interestingly, this effect is almost identical for both projects, as measured by the coefficient on the outcome variable in each model (0.586 and 0.574, respectively). Also of interest is the fact that in both the Cape Wind and Bluewater Wind models, the effect of having a generally positive attitude towards wind development, while still statistically significant, has less effect on support for a particular project when the variable measuring perceived fairness of process is included – compare the coefficient in model 1 (1.36) to that in model 2 (0.941) and that in model 5 (1.67) to that in model 6 (1.48). In other words, a generally positive attitude towards wind energy becomes less important in determining project support when perceptions of fairness are taken into account.

For process, age is also significant in both the Cape Wind and the Bluewater Wind models. However, whereas in the simpler model 1 high income significantly predicts opposition to Cape Wind, it does not do so in the model 2 containing the process variable; high income remains a strong predictor of Bluewater Wind support.

Finally, examining the process models (4 and 8), those more supportive of the project are more likely to view the process as just. This effect is slightly larger (0.755) at Cape Wind than at Bluewater Wind (0.651). Comparing the outcome models to the process models we are able to conclude that the outcome models fit the data better based on a comparison of pseudo R^2 values. While these results support the aforementioned theory that fair processes lead to higher acceptance levels, we cannot say for certain which way causation runs or for that matter whether the perceptions of process and opinion on the substantive question are jointly determined or whether they are mutually reinforcing.

At both Cape Wind and Bluewater Wind, the variable measuring the effect of having a generally positive attitude towards wind energy is no longer significant, implying that a person's view on the substantive question of the project in question trumps their general feelings towards wind energy. Interestingly, in the Cape Wind model (4) those who can see the ocean are more likely to interpret the process as fair, suggesting that the developer and the government through the environmental assessment process – a process that has not yet begun in Delaware – have been successful in engaging and consulting with those individuals most likely to be visually affected by the Cape Wind or other offshore projects in Massachusetts. Finally, in the Bluewater Wind models, while high income is a significant predictor of project support (model 6), it is also a significant predictor of perceiving the process as unfair (model 8).

5. Conclusions

Understanding how the public perceives the process under which offshore wind projects are brought forward, selected and developed is important because a fair

planning process, during which the public is given a sufficient say, may produce outcomes that feel more satisfying even if they do not please all of the stakeholders. This in turn can reduce the amount of tension between developers and communities and give momentum to the government's desire to spur offshore wind development (US DOE 2008).

Given the limitations of survey data generally (compared to semi-structured interviews, for example) and the limited nature of the survey's exploration into fairness, we cannot be fully confident about the effect of the planning process on public acceptance or whether the developers were able to foster feelings of fairness and trust. However, based on the results of the survey as described above, we can draw some preliminary conclusions.

Even though Delaware residents show far more support for the Bluewater Wind project (with 80% in favour of the project or leaning towards support) than do Cape Cod residents for Cape Wind (with a 57% support level), more similarities than differences emerge when perceptions of the public process, and the effect those perceptions have on substantive support or opposition, are examined. Judging from the 2009 survey responses, a plurality of residents in both cases is relatively satisfied with the transparency, fairness and the level of local say in the planning process. In addition, in both areas there is a strong correlation between project support and positive feelings on each of the three process metrics, as well as between opposition and negative feelings on those metrics. As we did not enquire about these aspects of project development in the earlier surveys, we cannot draw specific comparisons across time.

Although there are some differences between the Cape Wind and Bluewater cases, there are many similarities. In particular, when we control for a person's perception of fairness, having a generally positive attitude towards wind becomes a less important factor in project support. In other words, general attitudes towards wind energy give way to more site-specific considerations that arise in offshore project development, such as the degree to which a developer is perceived as being open and transparent and whether local citizens see themselves as having a voice in the process shaping and leading to project selection and development. These site-specific considerations, as noted in the literature, may have significant influence on project success.

Further, while the models are inconclusive on which direction causation runs between perceived fairness of the process and substantive support and opposition, or whether opinions on process and substance are jointly determined or mutually reinforcing, the outcome models fit the data better than the process models, providing some support for the theory that, when individuals are given voice and developer and government agency actions are seen as just (reasonable and fair), outcomes may be produced that feel more satisfying even if they do not please all of the stakeholders.

Overall, these findings underscore the importance of gaining further insight into the relationship between procedural fairness and substantive support/opposition during the offshore wind development process. As we have only asked these questions once, we recommend the collection of more empirical data on public perceptions of transparency, fairness and trust and on the role these perceptions play in successful project development. Further, collection of qualitative data through methods such as semi-structured interviews may be superior to mail survey methods in shedding light on the relationship between process and outcome.

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Notes

1. Although a continuous income measure is more precise, we instead employed a categorical income measure to enhance question response, given that respondents are more willing to check off a category than to write in a specific income figure, as our primary use of income was for weighting purposes (Dillman 2007).
2. There is an argument that wind project support and generally positive wind energy attitudes are endogenous (Gujarati 2003). However, because we desired to understand the relationship between general attitudes and satisfaction with the process and wanted to use parallel formulations for the process and outcome models, we include both here.

References

- Aitken, M., 2010. Wind power and community benefits: challenges and opportunities. *Energy policy*, 38, 6066–6075.
- Barry, J., Ellis, G., and Robinson, C., 2008. Cool rationalities and hot air: a rhetorical approach to understanding debates on renewable energy. *Global environmental politics*, 8 (2), 67–98.
- Bellaby, P., 2010. Foreword. theme 1: concepts of trust and methods for investigating it. *Energy policy*, 38, 2615–2616.
- Bergek, A., 2010. Levelling the playing field? The influence of national wind power planning instruments on conflicts of interests in a Swedish county. *Energy policy*, 38, 2357–2369.
- Breukers, S. and Wolsink, M., 2007. Wind power implementation in changing institutional landscapes: an international comparison. *Energy policy*, 35 (5), 2737–2750.
- Bureau of Ocean Energy Management (BOEM), 2012. *Cape Wind. Project overview*. [online] Available from: <http://www.boemre.gov/offshore/renewableenergy/CapeWind.htm> [Accessed 1 February 2012].
- CCH Macquarie, 1996. *The CCH Macquarie dictionary of law*. Sydney: CCH Australia Limited.
- Christensen, P. and Lund, H., 1998. Conflicting views of sustainability: the case of wind power and nature conservation in Denmark. *European environment*, 8 (1), 1–6.
- Conflict Research Consortium (CRC), 1998. Differing definitions of justice. [online] Available from: <http://www.colorado.edu/conflict/peace/problem/defjust.htm> [Accessed 1 February 2012].
- Dillman, D.A., 2007. *Mail and Internet surveys: the Tailored Design Method* (2nd ed.). Hoboken, NJ: John Wiley & Sons.
- Ellis, G., Barry, J., and Robinson, C., 2007. Many ways to say ‘no’, different ways to say ‘yes’: applying Q-Methodology to understand public acceptance of wind farm proposals. *Journal of environmental planning and management*, 50 (4), 517–551.
- Firestone, J., and Kempton, W., 2007. Public opinion about large offshore wind power: underlying factors. *Energy policy*, 35, 1584–1598.
- Firestone, J., Kempton, W. and Krueger, A., 2009. Public acceptance of offshore wind power projects in the USA. *Wind energy* 12 (2), 183–202.
- Firestone, J., et al., 2012. Public acceptance of offshore wind power across regions and through time. *Journal of environmental planning and management*, 55 (10), 1369–1386.
- Frey, B.S., Benz, M., and Stutzer, A., 2004. Introducing procedural utility: not only what, but also how matters. *Journal of institutional and theoretical economics*, 160, 377–401.
- Gallagher, L., Ferreira, S., and Convey, F., 2008. Host community attitudes towards solid waste landfill infrastructure: comprehension before compensation. *Journal of environmental planning and management*, 51 (2), 233–257.
- Gross, C., 2007. Community perspectives of wind energy in Australia: the application of a justice and community fairness framework to increase social acceptance. *Energy policy*, 35 (5), 2727–2736.

- Gujarati, D.N., 2003. *Basic econometrics* (4th ed.). New York: McGraw-Hill/Irwin.
- Hardin, R., 2001. Conceptions and explanations of trust. In: K.S. Cook, ed., *Trust in society*. New York: Russell Sage Foundation, 3–40.
- Jay, S. and Wood, C., 2002. The emergence of local planning authority on high-voltage electricity issues. *Journal of environmental policy and planning*, 4 (4), 261–274.
- Kempton, W., Archer, C.L., Dhanju, A., Garvine, R.W., and Jacobson, M.Z., 2007. Large CO₂ reductions via offshore wind power matched to inherent storage in energy end-uses. *Geophysical research letters*, 34, L02817.
- Khan, J., 2003. Wind power planning in three Swedish municipalities. *Journal of environmental planning and management*, 46 (4), 563–581.
- Krueger, A.D., Parsons, G.R., and Firestone, J., 2011. Valuing the visual disamenity of offshore wind power projects at varying distances from the shore: an application on the Delaware shoreline. *Land economics*, 87 (2), 268–283.
- Ladenburg, J. and Dubgaard, A., 2007. Willingness to pay for reduced visual disamenities from offshore wind farms in Denmark. *Energy policy*, 35, 4059–4071.
- Ladenburg, J. and Dubgaard, A., 2009. Preferences of coastal zone user groups regarding the siting of offshore wind farms. *Ocean and coastal management*, 52 (5), 233–242.
- MacCoun, R., 2005. Voice, control, and belonging: the double-edged sword of procedural fairness. *Annual review of law and social science*, 1, 171–201.
- Madsen, J., Bates, A., Callahan, J., and Firestone, J., 2011. Use of geospatial techniques in planning for offshore wind facilities. In: J.K. Thakur, S.K. Singh, A. Ramanathan, M.B.K. Prasad, and W. Gossel, eds. *Geospatial techniques: managing environmental resources*. Berlin: Springer and New Delhi: Capital Publishing Company, 256–276.
- Maguire, L.A. and Lind, E.A., 2003. *Public participation in environmental decisions: stakeholders, authorities and procedural justice*. Durham, NC: Nicholas School of the Environment and Fuqua School of Business, Duke University.
- Massachusetts Technology Collaborative (MTC), 2002. *Cape and Islands offshore wind outreach initiative. Progress report*. December.
- Minerals Management Service (MMS), 2010. *Efforts to reach a decision on the Cape Wind energy project*. Office of Public Affairs. [online] Available from: <http://www.doi.gov/news/doinews/upload/Fact-Sheet-Cape-Wind-with-SOL-edits-04-28-10.pdf> [Accessed 1 February 2012].
- NRG Bluewater Wind, 2010. *Process and timeline*. [online] Available from: http://www.bluewaterwind.com/de_timeline.htm [Accessed 1 February 2012].
- Oxford Dictionaries, 2011. Justice. [online] Available from: <http://oxforddictionaries.com/definition/justice?q=justice> [Accessed 1 February 2012].
- Pasqualetti, M.J., Gipe, P., and Righter, R.W., eds., 2002. *Wind power in view*. San Diego: Academic Press.
- Piero, J., 2010. Underlying motivations for Delaware public participation in support of offshore wind: implications for state energy policy. Unpublished thesis. University of Delaware.
- Ricci, M., Bellaby, P., and Flynn, R., 2010. Engaging the public on path to sustainable energy: Who has to trust whom? *Energy policy*, 38, 2633–2640.
- Skitka, L., Winquist, J., and Hutchinson, S., 2003. Are outcome fairness and outcome favourability distinguishable psychological constructs? A meta-analytic review. *Social justice research*, 16 (4), 309–341.
- Swofford, J. and Slattery, M., 2010. Public attitudes of wind energy in Texas: local communities in close proximity to wind farms and their effect on decision-making. *Energy policy*, 38 (5), 2508–2519.
- Thibaut, J. and Walker, L., 1975. *Procedural justice*. Hillsdale, NJ: Erlbaum.
- Thibaut, J. and Walker, L., 1978. A theory of procedure. *California law review*, 26, 1271–1289.
- Tyler, T.R. and Lind, E.A., 1992. A relational model of authority in groups. In: M. Zanna, ed. *Advances in experimental social psychology*, Vol. 25. New York: Academic Press, 115–192.
- Upreti, B.R. and Van der Horst, D., 2004. National renewable energy policy and local opposition in the UK: the failed development of a biomass electricity plant. *Biomass and bioenergy*, 26, 61–69.
- US Department of Energy (US DOE), 2008. *20% wind energy by 2030: increasing wind energy's contribution to U.S. electricity supply*. DOE/GO-102008-2567. [online] Available from: <http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf> [Accessed 1 February 2012].

- Walker, G., 1995. Energy, land use and renewables: a changing agenda. *Land use policy*, 12 (1), 3–6.
- Walker, G., et al., 2010. Trust and community: exploring the meanings, contexts and dynamics of community renewable energy. *Energy policy*, 38 (6), 2655–2663.
- Wolsink, M., 2007. Wind power implementation: the nature of public attitudes: equity and fairness instead of ‘backyard motives’. *Renewable and sustainable energy reviews*, 11 (6), 1188–1207.
- Wustenhagen, R., Wolsink, M., and Burer, M.J., 2007. Social acceptance of renewable energy innovation: an introduction to the concept. *Energy policy*, 35, 2683–2691.