

Explaining NIMBY Opposition to Wind Power

Eric R. A. N. Smith
Department of Political Science
University of California, Santa Barbara
smith@polsci.ucsb.edu

Holly Klick
Department of Political Science
University of California, Santa Barbara
Holly_Klick@umail.ucsb.edu

Abstract

Public opinion polls show that the American public strongly supports the development of wind power as an alternative to fossil fuels. Yet when specific wind farm proposals are made, they often meet local opposition, which is usually described as Nimby ("not-in-my-backyard") opposition.

We examine public toward wind power in depth using an internet survey. Instead of only asking about support for wind power, we investigate how people respond to advantages and disadvantages of wind power. Our data show that questions asked in national surveys about proposals such as wind farms exaggerate the support for wind farms because the answers are typically superficial, top-of-the-head responses. When people think about the advantages and disadvantages of wind farms, as they would if a wind farm were proposed for their community, their support diminishes. Therefore, to explain NIMBY effects, researchers must look at both local and national opinion.

Revised version of a paper delivered at the annual meeting of the American Political Science Association, Boston, Massachusetts, August 29, 2007

We would like to thank the Institute of Social, Behavioral, and Economic Research, U.C. Santa Barbara, for funding to support this research

Introduction

According to national opinion surveys, Americans overwhelmingly support government investment in renewable energy resources in general, and in wind power in particular. Despite this general popularity, proposals for specific wind power farms often face resistance from individual citizens, political leaders, grassroots organizations, national interest groups, and in some cases, even environmental groups. When local resistance occurs, observers typically compare the strong national support for a proposed project to the weak local support, and describe the opposition as being motivated by the NIMBY (not-in-my-backyard) syndrome. Yet the label only describes local resistance it does not explain it. Moreover, describing the opposition to a project such as nimbyism implies that the focus of attention should be on the local resistance, rather than on the general public's support.

National public opinion about wind power has been studied, but not in much depth. The survey questions used to gauge public opinion about wind power are broad, often single-item questions which oversimplify issues. In addition, the analysis of these surveys is limited. Few researchers have gone beyond reporting simple frequency distributions such as the percentage of the public in favor of wind power (e.g., Farhar 1994; Saad 2001).

We propose a new, broader conception of nimbyism, one that gives equal attention to both supporters and opponents of projects such as wind farms. We argue that part of the gap between national and local levels of support stems from the fact that national surveys reflect superficial, top-of-the-head responses. Once people begin to think carefully about ideas such as wind power, their support often diminishes.

To test our hypothesis, we conducted a national internet survey. We began by asking about support for a variety of conventional and alternative forms of energy. We then asked a series of questions about the pros and cons of wind power. We concluded by asking about support for wind power again. We found that support for wind power fell substantially when people considered the issue in more depth.

In this paper, we present our argument for a broader conception of nimbyism, the results of our experiment, and an examination of why people changed their minds about wind power after more careful consideration. We believe that our paper helps to explain both the political obstacles that wind power must overcome in order to expand and, more broadly, the nature of nimbyism itself.

Nimbyism and Wind Power

Wind power receives overwhelming support public support in national surveys. For example, in a recent CBS/New York Times Poll (2007), 75 percent of the respondents said they would be willing to pay more for electricity if it were generated by renewable sources such as wind or solar. In addition, over 60 percent of respondents supported requiring government office buildings to use renewable sources of energy such as solar and wind power, even if this kind of regulation resulted in higher taxes (Carroll 2007).

However, these are curious findings, indeed, because they are contrary to the strong opposition that wind proposals sometimes face at the local level.

These local protests are characterized as Nimby responses. Nimbyism is an “intense, sometimes emotional and often adamant local opposition to site proposals that residents believe will result in adverse impacts” (Kraft and Clary 1991; 300). This local opposition—stemming most notably from conflict between developers and activists—is cited as one of the fundamental challenges facing the wind industry (Bosley and Bosley 1990, 1992).

The criticisms presented by opponents are many. Most notably, critics identify noise, visual intrusion, electromagnetic interference, harm to birds and other wildlife, distrust of developer objectives, and lack of local ownership as the foremost reasons why they oppose wind farms (Erp 1997; Krohn and Damborg 1998; Simon 1996; Wolsink 1996).

Almost all of these reasons were cited by those who opposed the now infamous Cape Wind Project—a 130-unit wind turbine plant proposed to be stationed on a 24-square-mile area of Nantucket Sound (Williams and Whitcomb 2007). The Cape Wind Project has in many ways become emblematic of the opposition to wind farms at the local level. A group of Massachusetts residents formed the Alliance to Protect Nantucket Sound—a nonprofit group dedicated to preserving the landscape off Cape Cod. Members and locals alike claimed that the project would ruin the pristine landscape and was environmentally unsound. Most importantly, these groups opposed the plan because it placed the public’s ocean in the hands of private developers (Ebbert 2006; Kempton et al. 2005, 128). Political leaders—including Governor Mitt Romney (R-Mass), Senator Edward Kennedy (D-Mass.), and Robert F. Kennedy, a senior attorney for the National Resources Defense Council—joined forces and formed an unlikely coalition opposing the project (Daley 2006; Kennedy 2005; Vennochi 2004). Senator Kennedy even tried to insert language into a Coast Guard funding bill which would have allowed then Governor Romney ultimate veto power over the project (Daley, 2006)

This opposition to Cape Wind is not an isolated case. On Long Island, a citizen group known as the Jones Beach Ad Hoc Committee is committed to preventing forty wind turbines from entering Jones Beach. Land wind farms have also been subject to fierce, local opposition (Bosley and Bosley 1988; Pasqualetti 2001; Podger 2007; Wolsink 2000).

Theories of Nimbyism

The assumption underlying most studies of local resistance to proposed developments such as wind farms is that the reactions are, indeed, purely local. This assumption is widely accepted by the public and policy makers. Early academic studies of nimbyism also generally accepted the idea of Nimby responses being purely local. Kraft and Clary (1991) reviewed the academic literature on nimbyism and concluded that Nimby responses to development proposals are generally described as extreme opposition to local projects characterized by: (1) distrust of project sponsors; (2) high concern about project

risks; (3) limited information about project siting, risks, and benefits; (4) highly emotional responses to the conflict; and (5) parochial and localized attitudes toward the problem, which exclude broader implications. The first four items in this list raise questions about the reasonableness or rationality of the objections. The last item—localized attitudes—raises the question of selfishness. The early studies, however, have drawn a good deal of criticism (including from Kraft and Clary).

Kraft and Clary (1991) and other recent studies of Nimby responses found evidence suggesting that the only patterns which regularly appear are concerns about health and safety risks, as well as distrust of project sponsors (Hunter and Leyden 1995; Margolis 1996; Smith and Marquez 2000; Wright 1993). The claims that project critics lack relevant knowledge and are responding emotionally or irrationally have been rejected by a number of studies (Freudenburg and Pastor 1992; Irwin 1995; Michaud et al. 2008; Petts 1997; Wynne 1996).

Some investigators go beyond criticizing claims about aspects of nimbyism, arguing that the very concept of nimbyism may misrepresent what happens when people living near a proposed project resist it. Rootes (1999), for example, argues that what may seem to be a local community protest may be, in fact, a larger response in which local, national, and even international elements are intertwined. Other researchers suggest that protests are local because when a project is proposed for a site, contextual factors make it a natural place to protest. Interest is high, local residents learn about the proposals, and both local residents and outsiders focus their attention on the site (Burningham 2000; Kemp 1990). Yet these considerations do not mean that local protests represent only local opinion. Welsh (1993) argues that local protests are actually a local manifestation of a collective public response. Several studies of opinion on offshore oil development and nuclear power show that attitudes toward these energy sources in areas marked by nimby-style protests (e.g., Santa Barbara, California) are actually similar to statewide and national attitudes on the issues (Michaud et al. 2008; Smith 2002). Moreover, a recent review of studies of community reactions to wind farms showed that proximity to wind farms and nimbyism failed to explain people's opinions and policy preferences (Devine-Wright 2005). In short, describing protests against proposed projects as merely local resistance, or nimbyism, may be incorrect.

If the critics of the nimbyism concept are right, then the studies showing widespread public support for wind power may be misleading. National surveys showing strong support for wind power have simply never asked key questions about various characteristics of wind farms which people find objectionable—ugliness, noise, harm to birds and other wildlife, and so forth. It could be the case that support for wind power is widespread, but superficial. When confronted with unpleasant aspects of wind power, public support might melt away.

Public Opinion, Wind Power, and the Survey Response

Survey researchers investigating alternative energy have typically asked respondents broad, single-item questions. For instance, respondents have been asked how strongly they favor spending more government money on wind power. Even the more in-

depth survey items require little deliberation from respondents and often merge various types of renewable energies in a single question. For instance, a recent Gallup poll asked respondents to weigh in on their support for requiring government office buildings to use renewable sources of energy such as solar and wind power even if such a requirement would result in an increase in taxes (Carroll 2007). It is impossible to tell from this question if the respondents made a distinction between solar and wind power. Furthermore, respondents were asked to consider a single tradeoff associated with these renewable energies. These single-item questions do not provide respondents an opportunity to reflect upon tradeoffs nor consider contingencies related to their support of wind energy (Bell et al. 2005; Walker 1995; Wolsink 2000). In short, typical survey questions about alternative energy lead to superficial, top-of-the head responses.

In order to help explain why single-item questions elicit such answers, we draw on the work of scholars who argue that when respondents are asked survey questions, they sample their memories and retrieve relevant considerations (Alvarez and Brehm 2002; Chong 1993; Krosnick 1991; Tourangeau et al. 2000; Zaller 1992; Zaller and Feldman 1992). These authors start from the assumption that most people do not hold consistent, fully formed attitudes on all issues in their heads. Instead, they have a collection of considerations and predispositions¹.

Considerations and predispositions, however, can be conflicting and may not fall consistently on one side or the other of an issue. For instance, with regard to wind power, people may believe that wind power is good because it reduces greenhouse gas emissions, but they may also think that wind farms spoil scenery. When people are asked to answer questions, they quickly sample some of the most readily accessible considerations and answer based on those considerations.

Applying the belief sampling model to the problem of opinions about wind farms and nimbyism yields several predictions. When people are asked isolated questions about wind farms, they will quickly sample a few considerations and produce a superficial answer. Krosnick's (1991) description for this is "satisficing." When people are asked a long series of questions about wind power, however, more considerations will come to mind because the questions raise them. The questions offer respondents different, competing ways to frame wind power (Druckman and Chong 2007). When they answer a summary question about their overall view of wind power at the end of an interview, their answers will reflect a far broader set of considerations than the answer of a respondent who was only asked a single question. As Chong notes (1993, 888-89), "Respondents who give top-of-the head responses based on a single consideration often give a different response upon further reflection."

¹ A consideration is defined as "any reason that might induce an individual to decide a political issue one way or the other...[a consideration] is a compound of cognition and affect—that is, a belief concerning an object and an evaluation of the belief" (Zaller, 1992, 40). Alvarez and Brehm define predispositions quite broadly to include core values, group attachments, affective judgments, impressions, and expectations (Alvarez and Brehm, 2002, chapter 2).

Knowledge is central to understanding how the public perceives wind power. When people receive persuasive communications, they focus on certain considerations about the issue and disregard others. This is what Zaller (1992) refers to as resistance axiom and what Chong (1993) refers to as the “neutralization process.” According to both scholars, better educated and more politically knowledgeable respondents will prevent contrary considerations from entering their minds when considering an issue Zaller’s RAS model provides a good starting point. He makes several assumptions. First, exposure to mass communication messages increases with political knowledge. Second, among people who have been exposed, acceptance of the message increases with this knowledge if the message agrees with the person’s predispositions or basic values. Third, among people who have been exposed to said knowledge, acceptance of the message decreases with knowledge if the message is contrary to the person’s predispositions. So acceptance of a persuasive, controversial message depends on the individual’s political knowledge and also, on whether the message agrees or disagrees with the listener’s predispositions. As political awareness grows, people’s attitudes correlate more strongly with their basic values.

Chong (1993, 892), however, suggests a qualification. If a particular issue is not the subject of considerable public debate, the contrast between people with high and low knowledge levels substantially lessens. This caveat may apply to our case of wind power. Although wind power has recently started to receive attention from the mass media, only rare stories discuss the advantages and disadvantages of wind power. The public does not currently know much about wind power, and consequently, we cannot be sure that greater knowledge will cause people’s opinions to match their values more closely.

Our central theoretical expectation is that a lengthy series of questions about a narrow policy area will cause people to consider policies in more detail than they would if asked only a single question about it. This expectation is also grounded in research on psychological persuasion—namely, the heuristic-systematic model proposed by Chaiken (1980, et al.; Chaiken et al 1989; Chen and Chaiken 1999) and similarly, the elaboration likelihood model proposed by Petty and Capricioppo (1981, et al.; Petty and Capricioppo 1986a, 1986b; Petty and Wegener 1999). This model purports that there are two ways in which people respond to arguments in messages—heuristically and thoughtfully. The heuristic style mandates reliance on quick, easy decision rules to respond. Instead of carefully thinking about the issues in question, people answer based, for example, on whether a question describes a policy as “the president’s proposal.” In contrast, when people are sufficiently motivated and have the capacity to do so, they systematically and thoughtfully consider the pros and cons of the arguments in messages.

The elaboration likelihood model similarly maintains that there are two routes by which persuasive messages may be processed. The central route entails carefully thinking about, or elaborating, the merits of the message. This is related to systematic processing in Chaiken’s systematic-heuristic model. The peripheral route entails casually considering a message without much thought or effort, in a fashion related to heuristic processing.

Both sets of findings suggest that the respondent’s style of processing information is not stable and determined. Survey respondents do not process information solely in

superficial (peripheral and heuristic) *or* sophisticated (systematic and central routes) ways. Rather, both theories predict that more systematic or central processing will occur as the survey continues. Both sets of authors found that respondents engage in more sophisticated information processing when the quality and number of the survey items are greater, and when the topic at hand is personally relevant to the respondent (Chaiken 1980; Petty and Cacioppo 1984). Drawing from this literature, our theoretical expectation is that opinions toward wind power will change from the beginning of the survey to the end, as respondents are asked to consider both the costs and benefits associated with wind turbine development. Thus, as questions about wind power continue in an interview, we move from the superficial and overwhelming support for wind power, typical of single-question national surveys, toward the more balanced and critical views on wind power found in communities with wind farm proposals.

Survey Data

To test our hypotheses, we used data from an internet survey conducted by the [name deleted] Survey Research Center using a sample purchased from Survey Sampling International. The survey of 610 American adults was conducted June 18-23, 2008. Internet samples, of course, are generally not representative of their target populations (Berrens et al 2003; Malhotra and Krosnick 2007)—our sample is no exception. We can, however, say is that it is roughly representative. Our sample over-represents whites and under-represents blacks and Hispanics. In addition, it over-represents college graduates². However, the distributions of age and gender in our sample match the U.S. Census data quite well.

Despite the fact that our sample is only roughly representative, we believe that it provides a solid basis for testing our central hypotheses. We are not making descriptive claims. We are testing how people respond to a treatment (i.e., questions about wind power). If our hypothesis is supported by our data, it should hold up with a representative national survey as well.

Findings

We tested our central hypothesis—that a lengthy series of questions about wind power would cause people to consider wind policy in more detail, which would cause overall support for wind power to fall—with a simple design. Respondents were first asked about their support for wind power. They were next asked a series of factual questions about wind power and then a series of questions about the advantages and disadvantages of wind power. Finally, they were then asked about their support for wind power one additional time.

² Our sample is 88% white, 4% black, and 6% Hispanic; the Census reports 81% white, 12% black, and 16% Hispanic. In our sample, 96% graduated from high school and 32% graduated from college. The Census reports that only 86% graduated from high school and only 28% graduated from college.

The details are as follows. Our survey opened with a series of questions about support for seven different types of energy production, including wind power. The order of questions in the list was randomized so that wind power did not stand out. This is typical for questions about energy policy. The specific question was:

We would like to begin by asking you a series of questions about different sources of energy we can develop in the United States to meet our future needs. How strongly do you favor increasing U.S. production of each of the following energy sources?

- *Energy Sources: Oil, natural gas, coal, wind power, solar power, nuclear power plants, hydroelectric power dams.*
- *Answers: Strongly favor, somewhat favor, undecided, somewhat oppose, strongly oppose.*

Following the opening sequence of questions, respondents were asked four knowledge questions about wind power: how much pollution wind turbines produce compared to fossil fuel plants, whether wind power is cheaper than electricity produced from coal, whether wind turbines produce a steady stream of electricity regardless of weather, and whether wind power is considered a form of “alternative energy.” They were then asked how important five advantages and six disadvantages of wind power were on a four-point scale, from not important at all to very important.

The advantages were: (1) Producing more energy from wind reduces the amount of energy we need to import from foreign sources; (2) Wind farms increase tourism in local communities; (3) Wind turbines release no greenhouse gases, such as carbon dioxide, and help us fight global warming; (4) Wind power projects are a symbol of local, state and federal commitment to renewable energy; (5) Wind turbines release no air pollution, such as mercury, unlike other energy sources such as coal. The disadvantages were: (1) Wind turbine blades kill thousands of migratory birds and harm wildlife while they produce electricity; (2) Wind turbines are noisy, which bothers the people who live near them; (3) Wind power projects often include government giveaways of public lands to private wind farm developers; (4) Some people believe that wind turbines are ugly and spoil the scenery; (5) Wind turbines may lower local property values, harming local homeowners; (6) Wind energy is still more expensive than electricity produced by other sources such as coal. Finally, our respondents were asked to reconsider their opinions about wind power and again asked, “How strongly do you favor increasing U.S. production of wind power?”

Support for wind power dropped substantially. As Figure 1 shows, 72 percent of the respondents initially said that they strongly favored production of more wind power, but only 53 percent said so after considering the advantages and disadvantages of wind power. Figure 2 shows how individuals changed from the first question to the second. A majority of respondents did not change their opinions, but a quarter of them shifted one step on the ratings scale toward weaker support and seven percent moved even further. On the positive side, 12 percent of the respondents became more supportive of wind power. These differences are large and statistically significant ($p < .001$).

[Figures 1 and 2 about here]

These results confirm our central hypothesis. Getting people to think about various aspects of wind power in more detail caused some of them to change their opinions. Overall, support for wind power weakened once people thought carefully about the issue.

Explaining Individual Change

Now that we have seen that people change their opinions about wind power after considering the issue more carefully, the next question we must address is, which considerations triggered people's opinion changes?

In general, there are two ways in which asking respondents about the advantages and disadvantages of wind power could have changed their opinions. First, the specific issues we raised (e.g., greenhouse gases, dead birds) could have caused people to change their opinions. Second, our questions about wind power could have made people think more broadly about other considerations such as their core values or their previous opinions about wind power. That is, our questions could have reminded people about considerations that were not specifically mentioned in our questions.

Based on this reasoning, we approached the problem of explaining individual change in support for wind power with a regression model in which change in opinion on wind power, the variable shown in Figure 2, is our dependent variable. We used respondents' assessments of how important the advantages and disadvantages of wind power were to them, and two core values—liberal-conservative ideology and party identification—as independent variables.

The importance respondents assigned to the advantages and disadvantages of wind power were scored on a four-point scale: not important at all, not too important, somewhat important, or very important. "Very important" was the high score for each variable. Ideology was measured with a five-point scale, with conservative high. Party identification was measured with a seven-point scale with Republican high (the details of the survey can be found in the appendix).

Overall, the advantages of wind power were seen as more important than the disadvantages by most respondents, as Figure 3 shows. From 64 to 81 percent of the respondents saw four of the advantages as very important. The only advantage that a majority of respondents did not see as important was that wind farms could attract tourism. In contrast, only 31 percent of respondents said that the fact that "wind power is more expensive than electricity produced by other sources such as coal" was very important to them. Respondents saw the other disadvantages as being even less important.

[Figure 3 about here]

Only four of the advantage-disadvantage variables had statistically significant effects on changing support for wind power, as Table 1 shows.³ Curiously, only three of these relationships initially seem to make sense. As the importance of the facts that wind farms could lower property values and that wind power was more expensive than electricity from other sources grew, respondents shifted away from support for wind power. As the importance of the fact that wind turbines emit no pollution grew, respondents became more supportive of wind power. One noticeable result was the curious response to the statement “Wind turbines release no green house gases, such as carbon dioxide, and help us fight global warming.” As the importance of that advantage increased, respondents became *less* supportive of wind power ($b = -.36$). We speculate that some respondents regarded that claim as a false piece of “junk science” and responded accordingly. Our speculation is supported by an analysis of variance (ANOVA) analysis we conducted, which shows that when ideology and the importance of greenhouse gases are used as independent variables to predict change in support for wind power, there is a strong interaction effect between ideology and importance question ($p < .001$). That is, the more conservative respondents are, the more likely they are to reduce their support for wind power if they believe greenhouse gases are important.

[Table 1 about here]

Of the two values, only ideology was statistically significant. As one might expect, the more conservative people were, the more likely their support for wind power was to decline after they considered the issue more carefully.

Discussion

Our key finding is that insofar as our survey experiment mimics the difference between the general public and people who live near a wind farm or proposed wind farm, our data explain part of the nimby effect. Questions asked in national surveys about proposals such as wind farms exaggerate the support for wind farms because the answers are typically superficial, top-of-the-head responses. When people think about the advantages and disadvantages of wind farms, as they would if a wind farm were proposed for their community, their support diminishes.

When we looked for why people changed their opinions, we found that the opinion changes made sense. Economic self-interest clearly played a role. Support for wind power dropped among people who believed that wind farms would lower property values or would cost more than other sources of electricity. Environmental reasons also clearly played a role, certainly a more complex one. Support for wind power increased among people who believed that wind farms did not emit any air pollution. Unexpectedly, support declined among people who thought that the argument that wind farms emitted no greenhouse gases was important; however, this shift occurred primarily among conservatives, who apparently rejected the idea that greenhouse gases cause global

³ The regression models were estimated using multiple imputation of missing data (Rubin 1987, 1996). A model was also estimated using listwise deletion of missing data. The results of the two models differed only trivially.

warming. Ideology also had a direct effect on attitude change. Consequently, we find that both the characteristics of wind power and core values play roles in attitudes toward wind power.

In general, we expect that our findings about Nimby reactions to wind farms will also hold true of most cases of nimbyism. The concept of nimbyism, as it is commonly understood, focuses on how people living near a proposed development react to it. Implicitly, there is a comparison between local and national opinion. If national polls show support for an idea, but local opposition appears, observers say that it is a case of nimbyism. Yet the quality of the national support is invariably ignored. We argue that part of the gap between national and local levels of support stems from the fact that national surveys reflect superficial, top-of-the-head responses. Once the respondents of national surveys begin to think about ideas such as wind power, their support often diminishes. As a result, when we consider cases of nimbyism, we should examine national opinion, as well as local opinion, when searching for an explanation.

Appendix. Variable Coding

Ideology: 1= Very liberal; 2 = Somewhat liberal; 3= Middle of road; 4 = Somewhat conservative; 5= Very conservative.

Party Identification: 1 = Strong Republican; 2 = Weak Republican; 3 = Independent leaning Republican; 4= Independent; 5= Independent leaning Democrat; 6= Weak Democrat; 7= Strong Democrat.

Works Cited

- Alvarez, R. Michael, and John Brehm. 2002. *Hard Choices, Easy Answers*. Princeton, NJ: Princeton University Press.
- Bell, Derek, Tim Gray, and Claire Haggett. 2005. "The 'Social Gap' in Wind Farm Siting Decisions: Explanations and Policy Responses." *Environmental Politics* 14: 460-77.
- Berrens, Robert P., Alok K. Bohara, Hank Jenkins-Smith, Carol Silva, and David L. Weimer. 2003. "The Advent of Internet Surveys for Political Research: A Comparison of Telephone and Internet Samples." *Political Analysis* 11: 1-22.
- Bosley, P. and K. Bosley. 1988. "Public Acceptability of California's Wind Energy Development: Three Studies." *Wind Engineering* 12: 311-18.
- Bosley, P. and K. Bosley. 1990. "California Wind Energy Development: Environmental Support—and Opposition." *Energy and Environment* 11(2): 171-81.

- Bosley, P. B. and Bosley, K. 1992. "Risks and Benefits of Wind Generated Electricity." *Energy Sources*, 14, p. 1-9.
- Burningham, Kate. 2000. "Using the language of NIMBY: a topic for research, not an activity for researchers." *Local environment*, 5 (1), 55–67.
- Carroll, Joseph. 2007. "Americans Assess What They Can do to Reduce Global Warming." Gallup Organization, *Gallup Poll Release*, 24 April.
- CBS News/New York Times 2007 poll, April 20-24, 2007.
<http://graphics8.nytimes.com/packages/pdf/national/20070424_poll.pdf> accessed August 18, 2008.
- Chaiken, Shelly. 1980. "Heuristic versus systematic Information Processing and the Use of Source versus Message Cues in Persuasion." *Journal of Personality and Social Psychology* 39: 752-66.
- Chaiken, Shelly, A. Liberman, and Alice H. Eagly. 1989. "Heuristic and systematic Information Processing within and beyond the Persuasion Context." In James S. Uleman and John A. Bargh (eds.), *Unintended Thought*, 212-252. New York: Guilford Press.
- Chen, Serena, and Shelly Chaiken. 1999. "The Heuristic-Systematic Model in Its Broader Context." In Shelly Chaiken and Yaacov Trope (eds.), *Dual-Process Theories in Social Psychology*. New York: Guilford Press, 73-96.
- Chong, Dennis. 1993. "How People Think, Reason, and Feel about Rights and Liberties." *American Journal of Political Science*, 37: 867-99.
- Chong, Dennis and James N. Druckman. 2007. "Framing Public Opinion in Competitive Democracies." *American Political Science Review*, 101: 637-55.
- Daley, Beth. 2006. "Alaska Senator's Bid to Block Wind Farm Linked to Kennedy." *The Boston Globe*, April 25.
- Delli Carpini, Michael and Keeter, Scott (1996). *What Americans Know About Politics and Why it Matters*. New Haven: Yale University Press.
- Devine-Wright, Patrick. 2005. "Beyond NIMBYism: Towards an Integrated Framework for Understanding Public Perceptions of Wind Energy." *Wind Energy* 8:125-39.
- Ebbert, Stephanie. 2006. "Cape Wind is Dealt a Setback." *The Boston Globe*, April 7.
- Erp F. 1997. *Siting Processes for Wind Energy Projects in Germany*. Eindhoven University of Technology: Eindhoven.
- Farhar, Barbara C. 1994. "Public Opinion about Energy." *Public Opinion Quarterly* 58:603-32.

- Freudenburg, William R., and Susan K. Pastor. 1992. "NIMBYs and LULUs: Stalking the Syndromes." *Journal of Social Issues* 48:39-61.
- Gallup Poll. 2006. "Energy." <<http://www.galluppoll.com/content/default.aspx?ci=2167>>.
- Hunter, Susan and Kevin M. Leyden. 1995. "Beyond NIMBY: Explaining Opposition to Hazardous Waste Facilities." *Policy Studies Journal* 23 (4): 601-19.
- Irwin, Alan. 1995. *Citizen Science: A Study of People, Expertise, and Sustainable development*. London: Routledge.
- Kemp, R. 1990. "Why Not in My Backyard? A Radical Interpretation of Public Opposition to the Deep Disposal of Radioactive Waste in the United Kingdom." *Environment and Planning A* 22:1239-58.
- Kempton, Willett, Jeremy Firestone, Jonathan Lilley, Tracey Rouleau, and Phillip Whitaker. 2005. "The Offshore Wind Power Debate: Views from Cape Cod." *Coastal Management* 33:119-49.
- Kennedy, Robert F., Jr. 2005. "An Ill Wind Off Cape Cod." *New York Times*, December 16.
- Kraft, Michael E. and Bruce B. Clary. 1991. "Citizen Participation and the NIMBY Syndrome: Public Response to Radioactive Waste Disposal." *Western Political Quarterly* 44: 299-328.
- Krohn, Søren, and Steffen Damborg. 1999. "On Public Attitudes Towards Wind Power." *Renewable Energy* 16: 954-60.
- Krosnick, Jon A. 1991. "Response Strategies for Coping with the Cognitive Demands of Attitude Measures in Surveys." *Applied Cognitive Psychology* 5: 213-36.
- Malhotra, Neil, and Jon A. Krosnick. 2007. "The Effect of Survey Mode and Sampling Inferences about Political Attitudes and Behavior: Comparing the 2000 and 2004 ANES to Internet Surveys with Nonprobability Samples." *Political Analysis* 15:286-323.
- Margolis, Howard. 1996. *Dealing with Risk: Why the Public and Experts Disagree on Environmental Issues*. Chicago: University of Chicago Press.
- Michaud, Kristy E., Juliet E. Carlisle, and Eric R. A. N. Smith. 2008. "Nimbyism vs. Environmentalism in Energy Development Attitudes." *Environmental Politics*, 17: 20-39.
- Pasqualetti, M. 2001. "Wind Energy Landscapes: Society and Technology in the California Desert." *Society and Natural Resources* 14: 689-99.

- Petts, Judith. 1997. "The Public-Expert Interface in Local Waste Management Decisions, Expertise, Credibility, and Process." *Public Understanding of Science* 6: 359-81.
- Petty, Richard E., and John T. Cacioppo. 1981. *Attitudes and Persuasion: Classic and Contemporary Approaches*. Dubuque, Iowa: W.C. Brown.
- Petty, Richard E., and John T. Cacioppo. 1984. "The Effect of Involvement on Responses to Argument Quantity and Quality: Central and Peripheral Routes to Persuasion." *Journal of Personality and Social Psychology* 46: 69-81.
- Petty, Richard E., and John T. Cacioppo. 1986a. *Communication and Persuasion: Central and Peripheral Routes to Attitude Change*. New York: Springer-Verlag.
- Petty, Richard E., and John T. Cacioppo. 1986b. "The Elaboration Likelihood Model of Persuasion." In L. Berkowitz (ed.), *Advances in Experimental Social Psychology* 19: 123-205. New York: Academic Press.
- Petty, Richard E., and Duane T. Wegener. 1999. "The Elaboration Likelihood Model: Current Status and Controversies." In Shelly Chaiken and Yaacov Trope (eds.), *Dual-Process Theories in Social Psychology*. New York: Guilford Press, 41-72.
- Podger, Pamela J. 2007. "In a Corner of Virginia's 'Switzerland,' a Division over a Planned Wind Farm." *New York Times*, 13 February 2007, A17.
- Rootes, Christopher. 1999. "Acting Globally, Thinking Locally? Prospects for a Global Environmental Movement." *Environmental Politics* 8: 290-310.
- Rubin, Donald B. 1987. *Multiple Imputation for Nonresponse in Surveys*. New York: John Wiley.
- Rubin, Donald B. 1996. "Multiple Imputation After 18+ Years." *Journal of the American Statistical Association* 91:473 - 489
- Saad, Lydia. 2001. "Americans Mostly 'Green' in the Energy vs. Environment Debate." Gallup Organization, *Gallup Poll Releases*, 5 April.
- Saad, Lydia. 2007. "Most Americans Back Curb on Auto Emissions, Other Environmental Proposals." Gallup Organization, *Gallup Poll Release*, 5 April.
- Simon A. M. 1996. *A Summary of Research Conducted into Attitudes to Wind Power from 1990-1996*. [Online] British Wind Energy Association, London. Available: www.bwea.com/ref/survey.html.
- Smith, Eric R. A. N. 1989. *The Unchanging American Voter*. Berkeley: University of California Press.
- Smith, Eric R. A. N. and Marisela Marquez. 2000. "The Other Side of the NIMBY Syndrome." *Society & Natural Resources* 13: 273-80.

- Smith, Eric R. A. N. 2002. *Energy, the Environment, and Public Opinion*. Boulder, Colorado: Rowman & Littlefield.
- Tourangeau, Roger, Lance J. Rips, and Kenneth Rasinski. 2000. *The Psychology of Survey Response*. Cambridge: Cambridge University Press.
- Vennochi, Joan. 2004. "Cape Wind: Too 'Ugly' for the Rich?" *The Boston Globe*, December 14.
- Walker, Gordon. 1995. "Renewable Energy and the Public." *Land Use Policy* 12: 49-59.
- Welsh, Ian. 1993. "The NIMBY Syndrome: Its Significance in the History of the Nuclear Debate in Britain." *British Journal for the History of Science* 26: 15-32.
- Williams, Wendy, and Robert Whitcomb. 2007. *Cape Wind: Money, Celebrity, Class, Politics, and the Battle for Our Energy Future on Nantucket Sound*. New York: Public Affairs.
- Wolsink, Maarten. 1996. "Dutch Wind Power Policy." *Energy Policy* 24 (12): 1079-1088.
- Wolsink, Maarten. 2000. "Wind Power and the NIMBY-myth: Institutional Capacity and the Limited Significance of Public Support." *Renewable Energy* 21: 49-64.
- Wright, S. A. 1993. "Citizens' Information Levels and Grassroots Opposition to New Hazardous Waste Sites: Are Nimbyists Informed?" *Waste Management* 13: 235-59.
- Wynne, Brian. 1996. "Misunderstood Misunderstandings, Social Identities, and Public Uptake of Science." In *Misunderstanding Science? The Public Reconstruction of Science and Technology*. ed. Alan Irwin and Brian Wynne. Cambridge: Cambridge University Press, 19-46.
- Zaller, John R. 1992. *The Nature and Origins of Mass Opinion*. Cambridge, England: Cambridge University Press.
- Zaller, John R., and Stanley Feldman. 1992. "A Simple Theory of the Survey Response: Answering Questions versus Revealing Preferences." *American Journal of Political Science* 36: 579-616.

Figure 1. Support for Wind Power, Pre- and Post-Treatment

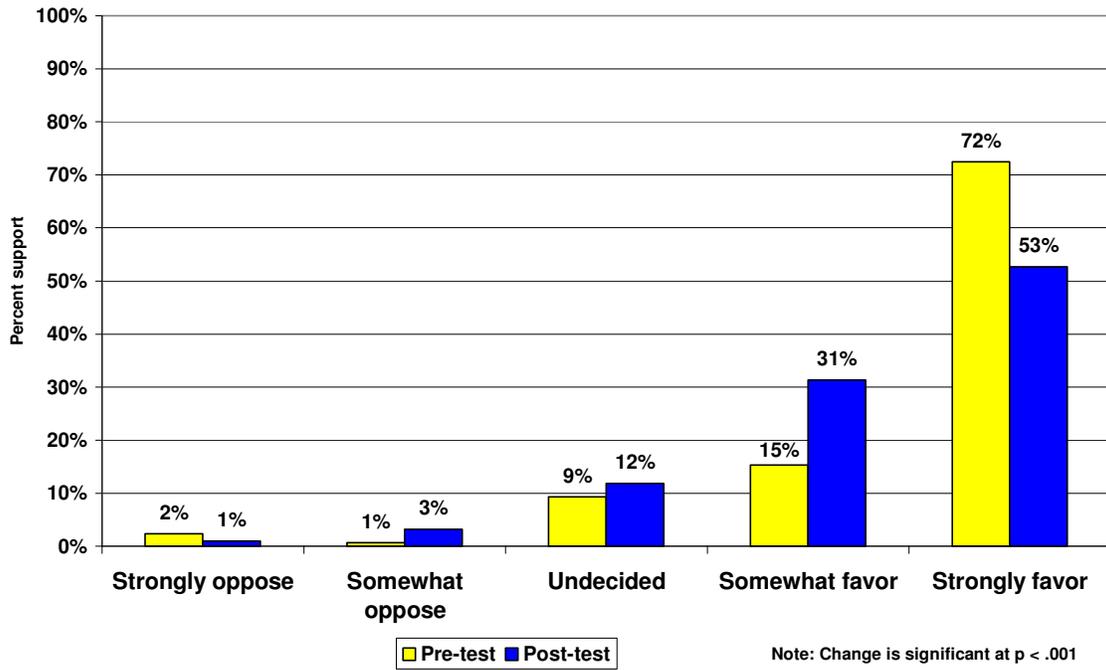


Figure 2. Individual Change in Support, Pre-test to Post-test

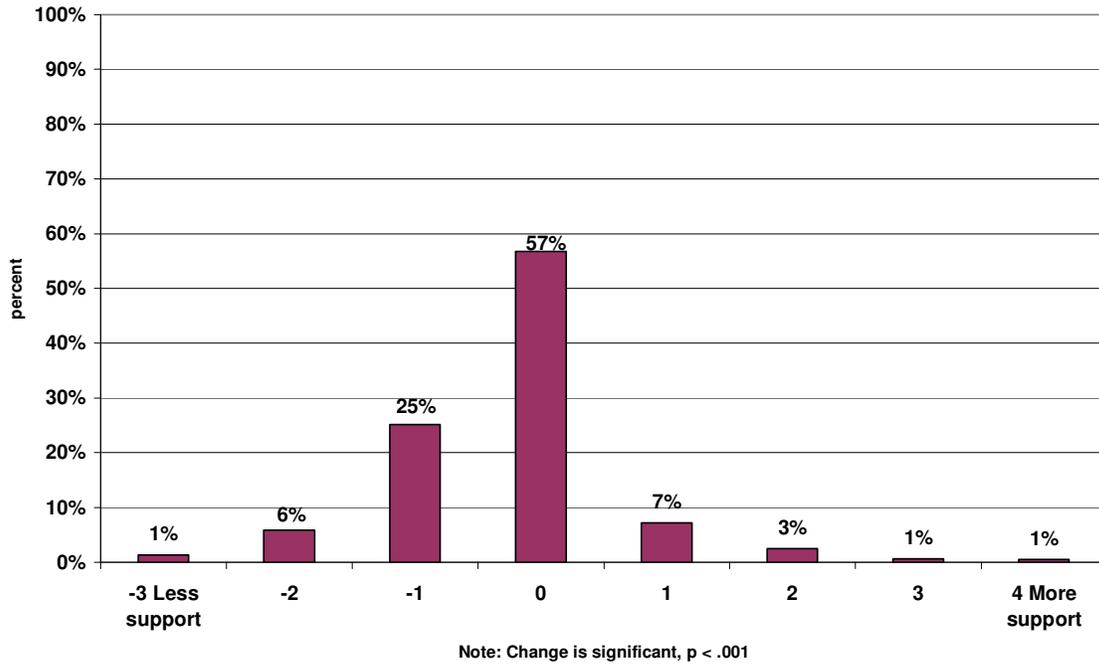


Figure 3. The Importance of Advantages and Disadvantages of Wind Power

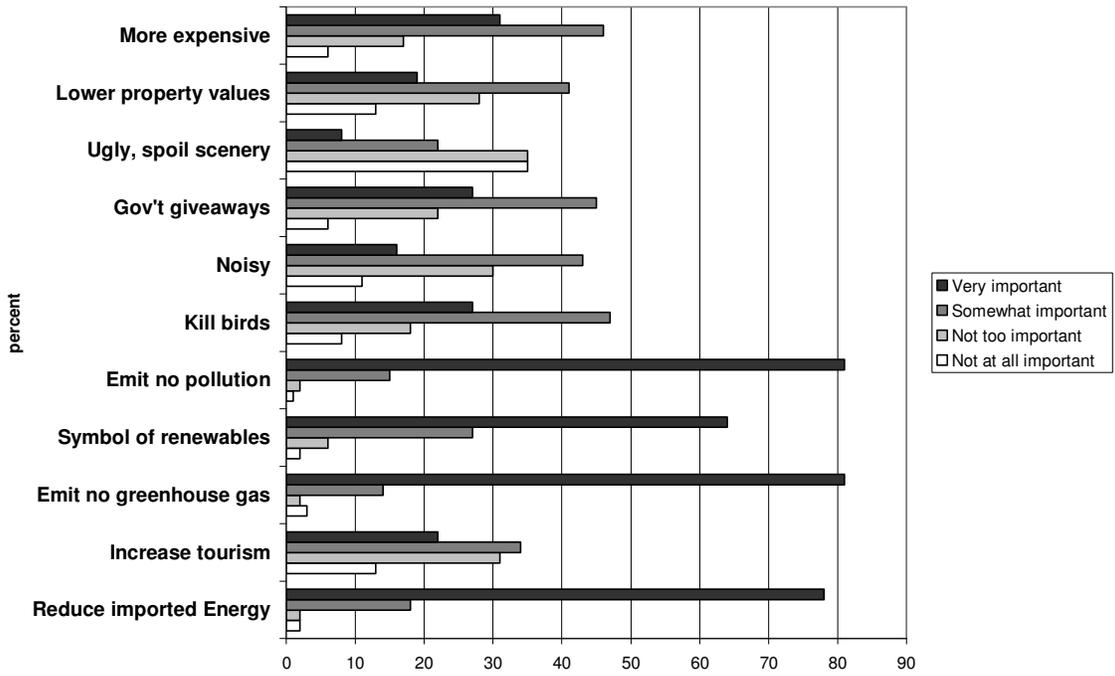


Table 1. Regression Models Explaining Change in Opinions

<i>Wind turbines:</i>	b	s.e.
Reduce imported energy	-0.02	0.09
Increase tourism	0.00	0.04
Emit no greenhouse gas	-0.38 ***	0.09
Symbol of renewables	0.01	0.07
Emit no pollution	0.20 **	0.10
Kill birds	0.03	0.05
Noisy	0.04	0.06
Gov't giveaways	-0.02	0.05
Ugly, spoil scenery	0.02	0.05
Lower property values	-0.12 **	0.05
More expensive	-0.17 ***	0.05
Ideology - conservative high	-0.09 **	0.04
Party Id - Republican high	0.02	0.02
Constant	1.27 ***	0.32
Adjusted R-square	0.07	
Sample n	610	

* p < .10; ** p < .05; *** p < .01