



The Effects of Wind Power on Beach Tourism

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Problem

- Although little empirical research has been undertaken to examine offshore wind power's effect (positive and negative) on tourism, opponents often cite perceived threats to tourism.

The Survey

- Survey of out-of-state beachgoers conducted in July and August 2007
 - Response rate: 81%
 - 1,076 surveys completed
- Cross-section of respondents obtained by sampling on weekends and weekdays at less and more developed beaches in Delaware:
 - Less developed beaches:
 - Cape Henlopen
 - Delaware Seashore State Park
 - Fenwick Island State Park
 - More developed sites:
 - Rehoboth Beach
 - Rehoboth boardwalk
 - Dewey Beach
 - Bethany Beach
 - Bethany boardwalk
- Beachgoers were sampled systematically through a geographic-transect method at each beach.
 - This method involved walking parallel to the beach parallel to the shore and then cutting in a straight line toward the ocean at regular, pre-determined intervals, intercepting the closest adult (one per group) that fell on the line.
- The number of surveys completed at each beach was not initially proportional to the number of visitors at each beach. Thus, beachgoers at more highly trafficked beaches had a lower chance of being selected, while those at less crowded or smaller beaches had a higher chance. Furthermore, beachgoers who visit the beach more often also had a higher chance of being selected to participate in the survey.
- Before analyzing the results, we weighted the data according to the relative beach visitation rate of the beach a respondent visited and by the inverse of the number of days a respondent reported to have visited Delaware beaches in the last 12 months.



Figure 1. The study area ranged from Cape Henlopen (Lewes) to Fenwick Island in southern Delaware

Survey Questions

- Respondents were shown a series of wind farm simulations (including those in Figure 2) at increasing distances from shore and asked whether their decision to visit the beach might have changed had a wind farm existed at each distance.
- The survey also investigates out-of-state beachgoer:
 - Opinions on wind power in general and offshore
 - Frequency of beach visits
 - Stated changes in beach visitation with a coal plant located 6 miles inland
 - Likelihood of visiting a beach to see a wind farm at least one time, and to take a tour of an offshore wind facility
 - Likelihood of selling property located in a beach community if a wind farm were to be built offshore
 - Criteria for beach selection
 - Trip expenditure levels

Objective

- Estimate the effect of offshore wind development in Delaware on tourism.
- Examine the link between the presence of offshore wind farms and beach selection.

Figure 2. Simulated views of offshore wind turbines as shown to respondents. Of the four distances used in the survey, two are shown here.



Source: Cape Wind EIS, U.S. Army Corps of Engineers

Selected Survey Results

Table 1: Support to place turbines in ocean (n=1034)

Encouraged	35.0%
Allowed if Appropriate	51.0%
Tolerated	5.7%
Prohibited	2.6%
Unsure	5.7%

These results illustrate the general, positive reaction of out-of-state beachgoers to offshore wind power development. The effect of the simulations on respondents' reported likelihood of visiting Delaware beaches is reported in Figure 3 below.

Figure 3. Reported visitation at varying wind distances (n=983)

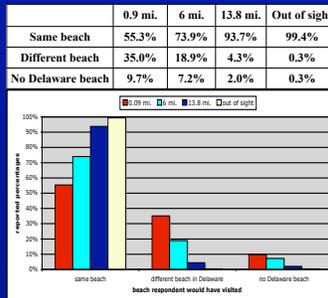
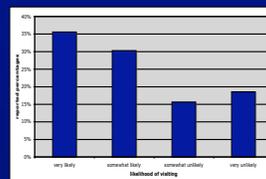


Figure 3 illustrates the most reported tourism loss for Delaware with an offshore wind farm at 13.8 miles, and more loss at six miles out. There is huge reported loss of tourism with wind turbines at 0.9 miles, but 0.9 is closer than any anticipated offshore wind developments.

Figure 4. Likelihood of visiting a new or different beach, at least once, to see a wind farm 6 miles from shore (n=495)



- Figure 4 illustrates the potential benefit to beach tourism in Delaware due to the curiosity effect created by an offshore wind farm.
- 65.8% of out-of-state tourists are likely to visit a beach they do not typically visit if a wind facility is built 6 miles offshore.

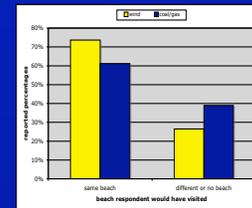
Additional Survey Results

Table 2: Likelihood of taking a boat tour (n=1010)

Very likely	15.9%
Somewhat likely	28.5%
Somewhat unlikely	23.1%
Very unlikely	32.4%

- These results indicate the potential, positive tourism effect of offshore wind farms, given that 44.5% of out-of-state beachgoers would likely take a boat tour of an offshore wind facility, if one was built along the Delaware coastline.

Figure 5. Comparison of beach choice: wind farm 6 mi. offshore vs. coal or natural gas plant 6 mi. inland (n=976)



- Figure 5 shows that 12.5% fewer respondents would continue visiting a beach near a coal or gas power plant than would continue visiting a beach near an offshore wind farm even though the wind farm would be more intrusive on the ocean view. This difference in beach avoidance is statistically significant.

Contingent Behavior Modeling Results

- Logistic regression was employed to predict beachgoers' reported likelihood of visiting a Delaware beach after viewing a 6-mile simulation. That likelihood is significantly increased among respondents below 30 years of age.
- Conversely, a significant, inverse relationship exists between the likelihood of visiting a Delaware beach and the following variables:
 - mean income
 - mean trip cost
- Additional modeling will further uncover the effect of offshore wind power on Delaware beach tourism.

Policy Implications

- Based on these findings of beach visitors' statements of intent to switch beaches, we would not advise developers of offshore wind to claim that there will be no negative impact on tourism. Some beachgoers report they would avoid beaches with visible turbines.
- However, the reported avoidance effect diminishes with greater distance from shore, the avoidance of wind turbines is less than the avoidance of fossil fuel power plants, and avoidance of beaches with wind turbines is substantially less than attraction, to beaches or boat tours, in order to see the wind turbines.

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