1. INTRODUCTION

Over the last two decades the demand for renewable energy has increased and in response the wind energy industry has grown dramatically.1 Recently, offshore wind power has emerged as a "new frontier" in wind energy, with more than 20,000 megawatts ("MW") of new generating capacity planned for the waters of Northern Europe alone.2 By the end of 2007, some projections suggest that the offshore renewable energy market may be worth as much as $12 billion, with offshore wind power accounting for roughly 97% of this figure.3


3 See DOUGLAS-WESTWOOD LTD., THE WORLD OFFSHORE RENEWABLES REPORT: 2002 - 2007 §§ 2.2, 4.5.3 (2002) [hereinafter WORLD OFFSHORE RENEWABLES REPORT] (Between Germany, UK, Sweden, and Denmark, the most prominent European countries in the offshore wind sector, there is a possibility of 17,000 [megawatts ("MW")]) of installed capacity by 2010."), available at http://www.dti.gov.uk/energy/renewables/publications/pdfs/offshorereport.pdf; see also World
Both the United States and the United Kingdom have abundant offshore wind resources.\(^4\) Wind developers in both nations have attempted to obtain regulatory approval to construct numerous offshore wind energy plants called wind farms. In the United Kingdom, developers have secured government permission to construct at least three offshore wind farms, one small offshore wind farm installation is already operational, and at least twenty developments are expected to become operational by 2005.\(^5\) In the United States, however, not even one offshore wind developer has obtained permission to construct an offshore wind farm.\(^6\)

This Comment argues that differing regulatory environments, not differing resources, explain the varying fortunes of the offshore wind power industry in the United Kingdom and the United States. Section 2 provides an overview of the offshore wind energy industry and explains why offshore wind power is both an attractive and a controversial renewable energy option. Section 3 examines the framework of environmental regulation, which offshore wind developers operate in the United Kingdom and the United States. Section 4 examines the framework of land use regulation in both nations. Section 5 argues that uncertainty about land use laws in the United States explains why the offshore wind power industry has been more successful in the United Kingdom than in the United States.\(^7\)

\(^4\) See WIND FORCE 12, supra note 2, at 24 ("[T]he world’s wind resources are huge, and distributed over almost all regions and countries.").

\(^5\) See FUTURE OFFSHORE, supra note 1, at 8 ("[T]here are now 20 offshore wind farms planned for commissioning by around the summer of 2005, which should supply approximately 1.4GW of renewable energy."); see also THE CROWN ESTATE, OFFSHORE WIND FARMS: PUTTING ENERGY INTO THE UK (stating that in 2002, one offshore wind farm was already operational in the United Kingdom’s waters and that two additional developments have obtained statutory consents needed for construction), available at http://www.crownestate.co.uk/estates/marine/wind farms.shtml (last modified July 16, 2003). The Crown Estate is the administration that manages the royal family’s lands, which include the seabed out to the twelve nautical mile territorial limit.


\(^7\) This Comment focuses on environmental and land use regulation and does
2. OVERVIEW OF OFFSHORE WIND POWER


The technology to convert offshore wind energy into electricity on a commercial scale emerged as early as 1991, when the Vindeby wind farm was commissioned near the island of Lolland in Danish waters.\(^8\) Wind energy harvesting devices are popularly referred to as wind mills but are more properly known as wind turbines.\(^9\) Wind turbines generally consist of an electrical generator connected by a shaft to a three-bladed rotor (the rotor is visually similar to an aircraft propeller blade).\(^10\) The generator assembly is referred to as a nacelle and is mounted on a hollow steel tower anchored to the floor of the continental shelf using one of a number of foundation technologies.\(^11\) Modern offshore wind turbines may soon stand as high as 127 meters (417 feet) from sea level to maximum rotor height.\(^12\) Offshore turbines generally are installed within ten kilometers of a shoreline and in water not more than thirty meters deep, due to the expense of installation in deeper waters by deployment of long underwater cables.\(^13\)

Wind-harvesting technology has improved dramatically since the "great California wind rush" of the 1980s.\(^14\) While a typical


\(^10\) Id.

\(^11\) Id.


\(^14\) Guided Tour on Wind Energy, supra note 9, at 299-300 (noting that at least one wind farm in California constructed in the 1980s boasts over 1,000 turbines).
wind turbine from the 1980s could produce around fifty-five kilowatts ("kW"). Modern machines produce around fifty times as much electricity as their 1980s precursors. Commercially available models produce up to 2,500 kW (2.5 MW) of electricity and larger models are under development. With these improvements in technology, "[t]he production cost of a kilowatt hour of wind power is one fifth [sic] of what it was 20 years ago."

2.2. Case Study Projects

This Comment occasionally refers to two offshore wind projects currently under development to illustrate how individual projects are unfolding in the legal contexts of the United Kingdom and the United States. These projects are: (1) the North Hoyle project in the United Kingdom and (2) the Cape Wind project in the United States.

In the United Kingdom, the planned 30-turbine North Hoyle project, undertaken by National Wind Power ("NWP"), illustrates a successful navigation of the planning, site selection, and regulatory review phases of project execution. The developer, NWP, has obtained "all of the necessary statutory consents to begin construction" and began constructing the North Hoyle project in the spring of 2003, with the help of turbine manufacturer Vestas Celtic Wind Technology and offshore construction firm Mayflower Energy. North Hoyle will be the United Kingdom's first major offshore wind farm and will be located off the coast of Northern Wales. The North Hoyle wind farm will stand approximately eight kilometers from land and will

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15 Id. at 300.

16 See WIND FORCE 12, supra note 2, at 13 (noting that 3,000 to 5,000 kW machines are currently under development).

17 Id. at 5 (describing the results of wind power market growth).


19 A diary of pictures and information about the construction process is available at the project's web site. See NATIONAL WIND POWER, CONSTRUCTION PHOTO DIARY (2003) (providing pictures of at least one completed turbine assembly), at http://www.natwindpower.co.uk/northhoyle/progress.htm.

20 NATIONAL WIND POWER, supra note 18.

21 Id.
rest in water between five and twelve meters deep.\textsuperscript{22} NWP estimates that North Hoyle will generate enough electricity for roughly 50,000 homes and offset the release of 160,000 tons of carbon dioxide each year.\textsuperscript{23}

In the United States, Cape Wind Associates, L.L.C. ("Cape Wind") has undertaken construction of a 130 foot turbine wind farm in the shallow,\textsuperscript{24} federally controlled\textsuperscript{25} waters of Horseshoe Shoal in Nantucket Sound. The Cape Wind project would spread turbines over approximately twenty-four square miles of ocean\textsuperscript{26} and, at points, would stand as close as eight kilometers (approximately five miles) to the Massachusetts shoreline.\textsuperscript{27} Although the developer claims that "from the shore, the slender supporting towers will blend in with the horizon and will be visible one half inch above the horizon on clear days,"\textsuperscript{28} opponents of the project have suggested that the project would be a blight on an otherwise scenic seascape.\textsuperscript{29}


\textsuperscript{23} These estimates are consistent with government data from a smaller, existing offshore wind farm off the coast of the United Kingdom. See THE CROWN ESTATE, supra note 5 (noting that the two turbine installations at Blyth with slightly smaller and less-advanced turbines produces enough electricity for approximately 3,000 households).

\textsuperscript{24} According to a study commissioned by USACE, the Cape Wind project would occupy water depths between four and fifteen meters. GARRAD HASSAN REPORT, supra note 22, tbl.4.


\textsuperscript{26} For a map of the proposed location of the Cape Wind development, see Cape Cod Online Nantucket Sound Wind Farm Website at http://www.capecodonline.com/special/windfarm/ (last visited Sept. 16, 2003).

\textsuperscript{27} GARRAD HASSAN REPORT, supra note 22, tbl. 4.


\textsuperscript{29} See John Leaning, Wind Farm Plan Extolled, Lambasted, CAPE COD TIMES, Jan. 31, 2003 (noting the view of some Cape Cod residents that "to tinker with the Cape’s unspoiled vistas and oceans is to tamper with the very elements which make this place so special"), available at http://www.capecodonline.com/
GE Wind Energy has agreed to construct the 3.6 MW turbines for the project.\textsuperscript{30} Together, the 130 turbines would have a maximum generation capacity of 420 MW,\textsuperscript{31} perhaps providing enough energy to power more than half a million homes by 2005.\textsuperscript{32} Cape Wind Associates estimates that the clean power produced at the Cape Wind farm will eliminate “4,642 tons of sulfur dioxide, 120 tons of carbon monoxide, 1,566 tons of nitrous oxides, more than a million tons of greenhouse gases, and 448 tons of particulates from being dumped into the air” each year.\textsuperscript{33}

The Cape Wind Project is currently in the midst of extensive regulatory review involving at least seventeen federal, state, and local regulatory bodies.\textsuperscript{34} As discussed below, the United States Army Corps of Engineers (“USACE”) is currently reviewing the proposed project’s likely environmental impact.\textsuperscript{35}

\textit{2.3. Advantages of Renewable Energy}

One of the advantages of renewable energy generally and wind energy in particular, is that harvesting it involves few negative externalities. Energy derived from fossil and nuclear fuels, however, involves a number of negative externalities.\textsuperscript{36} First, the market price of energy derived from fossil and nuclear fuels often does not reflect the actual long-term cost of fuel exhaustion,

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\item \textsuperscript{30} See Coleman, supra note 12 (noting that these turbines produce more electricity than the 2.7 MW originally expected and the current average of 1.5 MW).
\item \textsuperscript{31} \textit{Id.} at 5 (noting that technological advances allow 130 towers to produce as much electricity as 170 towers did when plans were initially conceived).
\item \textsuperscript{32} See CAPE WIND WEBSITE, PROJECT AT A GLANCE, supra note 28 (noting that the Cape Wind development will produce enough electricity to power more than three-quarters of the Cape, and will replace up to 113 million gallons of oil a year).
\item \textsuperscript{33} \textit{Id.}
\item \textsuperscript{34} See Storm Over Mass. Windmill Plan, CBS News Sunday Morning (June 29, 2003) (noting that the USACE will make the final decision as to whether the wind farm may be constructed), at http://www.cbsnews.com/stories/2003/06/26/sunday/main560595.shtml.
\item \textsuperscript{35} See infra at § 3.2.
\item \textsuperscript{36} In economic terms, the marginal private cost of producing a kilowatt (“kW”) hour of electricity using fossil or nuclear fuel is less than the marginal social cost of doing so. See WILLIAM J. BAUMOL & ALAN S. BLINDER, MICROECONOMICS: PRINCIPLES AND POLICY 305 (7th ed. 1998) (discussing generally externalities and inefficiency).
\end{itemize}
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pollution, energy dependence, and massive government subsidies.

Second, the price of energy derived from fossil and nuclear fuels does not reflect the future cost involved in the exhaustion of fossil fuels, adaptation of new technologies to replace fossil-fuel technologies, and exhaustion of waste disposal sites for spent nuclear fuels. Sidney Borowitz predicts that existing oil reserves will last for several decades to a century, but notes that supplies of coal, a more serious pollutant, are more plentiful. Nuclear fuels are unlikely to be exhausted in the near future, but the price of electricity derived from nuclear fuels does not necessarily reflect the future costs associated with a diminishing supply of suitable nuclear waste disposal sites.

Third, pollution and associated environmental degradation are also serious constraints on the usefulness of fossil and nuclear fuels, and are driving forces behind the growing demand for renewable energies. There are a number of types of pollution associated with power generation from fossil and nuclear fuels. Perhaps of greatest concern are air pollution (resulting from burning fossil fuels) and radiation pollution (associated with the production of nuclear fuels and storage of nuclear waste). While


38 See SIDNEY BOROWITZ, FAREWELL FOSSIL FUELS: REVIEWING AMERICA'S ENERGY POLICY 114 (1999) (assessing the dangers of reliance on fossil and nuclear fuels and discussing the potential of renewable energy sources to displace reliance on non-renewable sources).

39 Id. at 9-11 (noting that despite global depletion of fossil fuels, the market price remains "unreasonably cheap").

40 Certain byproducts of uranium fission (including plutonium) are themselves fissionable and can effectively multiply the supply of uranium-derived fission power by at least a factor of fifty. Thus, while uranium and other nuclear fuels exist in finite supply, their scarcity is not nearly as problematic as the scarcity of suitable disposal sites for nuclear waste. Id. at 90-91 (noting some of the dangers of nuclear waste and the challenges of containment efforts).

41 For more information about some of the potential consequences of continued reliance on fossil fuels for power generation, see UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, GLOBAL WARMING - CLIMATE (2003), at http://yosemite.epa.gov/oar/globalwarming.nsf/content/climate.html.

42 Pollution dangers associated with nuclear power production also include radiation emitted by nuclear fuel before it reaches a nuclear reactor as well as radiation emitted by unspent fuel and waste products associated with nuclear reactions. See BOROWITZ, supra note 38, at 89 (noting the estimated 50,000
predicting the future is never an exact science, many scientists now believe that global warming caused by fossil fuel-related emissions poses a major threat to the environment.\textsuperscript{43}

Fourth, the uneven distribution of fossil fuels and, to some extent, nuclear fuels, also favors the development of renewable energy resources and shapes the regulation of offshore wind power. As the National Association of Regulatory Utility Commissioners has stated, “[r]enewable energy supply brings fuel diversity benefits and mitigates fuel market power in the nation’s mix of energy supplies, enhances national security by reducing dependence on imported fuels.”\textsuperscript{44} Renewable energy is thus particularly attractive for economies with poor fossil fuel and nuclear fuel resources.\textsuperscript{45}

2.4. Wind Energy and Other Renewables

Wind energy is only one of a number of renewable energy (“renewables”) options. While an in-depth discussion of all current renewables options is beyond the scope of this Comment, wind energy has great potential to help replace or greatly reduce the use of fossil and nuclear fuels. In addition, it also avoids some of the drawbacks of other renewables.

Geothermal energy, which involves the harvesting of heat energy from the earth’s core, remains highly experimental.\textsuperscript{46} Natural gas is a fossil fuel and therefore not truly a renewable

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\textsuperscript{45} See BOROWITZ, supra note 38, at 9 (mentioning the effects of uneven oil distribution on the price of crude oil in the 1970s and the resulting global economic recession).

\textsuperscript{46} Id. at 166 (noting that neither the government nor private industry have committed to developing functional geothermal installations).
source of energy. However, gas has some environmental advantages over oil and coal.\textsuperscript{47} Hydroelectric energy has already been exploited in many locations, but economically and environmentally feasible options for harvesting it on a grand scale in the United States and most of the industrialized world have been virtually exhausted.\textsuperscript{48} While solar energy has shown some promise, it remains prohibitively expensive under most circumstances since energy must be stored for nighttime use.\textsuperscript{49} Biomass energy, generally produced by the burning of wood or crops, has proven itself particularly successful in Brazil, but currently is prohibitively expensive where labor costs are high.\textsuperscript{50} Tidal energy can only be economically harvested in very limited regions of the world.\textsuperscript{51} Although hydrogen-based power generation (including certain fuel cell technologies) may some day provide affordable renewable energy, major technological and cost barriers remain.\textsuperscript{52}

In a recent report prepared for the United Kingdom’s Department of Trade and Industry (“DTI”), energy industry consultants Douglas-Westwood estimated the current cost of generating electricity using nuclear, fossil fuel, and renewable energy technologies.\textsuperscript{53} Based on the average cost figures provided

\begin{footnotesize}
\begin{enumerate}
\item See id. at 73 (explaining that natural gas contributes the least of any fossil fuel to the greenhouse effect and produces less harmful byproducts).
\item See id. at 155-57 (noting that environmental protection laws, dislocation of people in densely populated areas, difficulty of bringing workers to remote areas, and environmental harm due to construction are all factors that inhibit the development of hydroelectric power).
\item See id. at 113-15 (indicating that fossil fuel remains the cheapest method of generating power despite improvements in solar power generation).
\item See id. at 137 (questioning whether the Brazilian biomass model can work in the United States, where gasoline is cheaper, labor more expensive, and cropland more available).
\item See id. at 171 (showing that tidal energy is mainly suited to remote areas where the cost of other kinds of energy are high and there are exploitable tidal heads).
\item See World Offshore Renewables Report, supra note 3, § 3.1 (“These generation costs are based on current standard calculation formula, which vary by sector, e.g. some assume a 20-year lifespan, others 50-year, and as such are for illustrative purposes only.”) [emphasis in original]. Although the report states that its figures are based on current “standard” calculation methods, it does not
\end{enumerate}
\end{footnotesize}
in that report, wind power may be the most affordable source of renewable energy other than large-scale hydroelectric power.\textsuperscript{54} As noted above, however, there are a diminishing number of sites available for large-scale hydroelectric power plants.\textsuperscript{55} Thus, the marginal cost of energy from new wind developments may in fact prove lower in the long term than the marginal cost of energy from new large-scale hydroelectric power plants.

Based on the recent growth of the offshore wind power industry, it appears that the renewable energy market has made a similar assessment of wind energy's potential versus other renewable energies. The Douglas-Westwood report forecasted that in 2002 the offshore renewable energy market (in which offshore wind is by far the largest subsector) would continue to grow over 200\% per year for several years, eventually falling to just below 150\% per year in 2007.\textsuperscript{56} The report predicted that renewables generally, by contrast, would grow at less than 25\% during this period.\textsuperscript{57}

2.5. Offshore and Onshore Wind Power

Offshore locations are particularly advantageous for harvesting wind energy because of a variety of considerations that may soon make the cost of harvesting offshore wind energy lower than that of harvesting it above land masses.\textsuperscript{58} First, average wind speeds are higher over large bodies of water than they are over most types of land surfaces.\textsuperscript{59} Because wind power increases exponentially with wind speed, even small increases in wind speed dramatically increase wind power,\textsuperscript{60} permitting developers to harvest far more

\textsuperscript{54} Id.
\textsuperscript{55} See supra text accompanying note 48.
\textsuperscript{56} World Offshore Renewables Report, supra note 3, § 3.2.
\textsuperscript{57} Id.
\textsuperscript{58} Currently, average offshore costs exceed onshore costs by an approximate ratio of 5.5 to 4. World Offshore Renewables Report, supra note 3, § 3.1.
\textsuperscript{59} See Future Offshore, supra note 1, at 14 (noting that wind speeds are generally higher at sea).
energy per turbine. Second, wind over oceans has fewer obstacles to produce turbulence, which causes wear and tear as well as increases turbine maintenance and replacement costs. Third, because the oceans are largely devoid of fixed structures, developers can construct offshore wind farms close to densely populated coastal areas where the cost of onshore land would be prohibitive. Fourth, offshore wind energy can minimize the aesthetic impact of wind harvesting technology by keeping it away from scenic shorelines. Fifth, because drag produced by ocean waves is very low (particularly in the shallow waters of the continental shelf), wind speed over water increases less with height than it does over land. This permits developers to operate wind turbines at a lower and less expensive "hub height" over water than over land. Sixth, offshore location of wind turbines can help prevent audible noise pollution by keeping it out to sea. While noise pollution has become less of a concern as turbine technology has advanced, this consideration remains an important factor in

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61 See id. at 171 (noting that wind power increases with the cube of wind speed, although the efficiency of a given wind harvesting device decreases beyond a certain wind speed).

62 Turbulence is irregularity in the flow of air or other material. See GUIDED TOUR ON WIND ENERGY, supra note 9, at 44 (discussing in great detail the mechanics of harvesting wind energy).

63 See WIND ENERGY FACT SHEET 1, supra note 13, at 1 (noting the greater speeds and reduced turbulence of ocean winds); see also Gunner C. Larsen, Offshore Fatigue Design Turbulence, 4 WIND ENERGY 107, 107 (2001) ("Fatigue damage on wind turbines is mainly caused by stochastic loading originating from turbulence. While onshore sites display large differences in terrain topology, and thereby also in turbulence conditions, offshore sites are far more homogeneous, as the majority of them are likely to be associated with shallow water areas.").

64 See GUIDED TOUR ON WIND ENERGY, supra note 9, at 304 (noting that "difficulties in finding suitable sites on land" make offshore wind power particularly attractive for countries with high population densities).

65 Wind turbines have increased dramatically in size over the last decade because of efficiency considerations, thus making offshore placement even more advantageous. See Frode Birk Nielsen, A Formula for Success in Denmark, in WIND POWER IN VIEW: ENERGY LANDSCAPES IN A CROWDED WORLD, 119-21 (Martin T. Pasqualetti et. al. eds. 2002) (noting that marine areas provide for a great number of large turbines).

66 Drag is caused when wind is slowed by rough surfaces. See DANISH WIND ENERGY ASSOCIATION, ROUGHNESS AND WIND SHEAR, at http://www.windpower.org/en/tour/wres/shear.htm (last updated June 1, 2003).


68 Id.
favor of offshore location.\textsuperscript{69} Finally, wind patterns fluctuate less between day and night offshore than onshore, eliminating or reducing the cost of generating backup power for periods of low wind speed.\textsuperscript{70}

2.6. Competitiveness of Offshore Wind Power

Several associations and government entities have made attempts to assess the offshore wind power industry's future competitiveness with power plants driven by fossil and nuclear fuels. But any such projections depend on variables that cannot be predicted with precision or that vary from site to site. These variables and uncertainties include: 1) the future cost of power derived from competing fossil and nuclear fuels,\textsuperscript{71} 2) seabed geology at wind farm sites, 3) water depth at wind farm sites, 4) distance of wind farm sites from shore,\textsuperscript{72} 5) future cost of capital to offshore wind farm developers, 6) expenses related to connecting to local power grids,\textsuperscript{73} 7) size of wind farm sites,\textsuperscript{74} 8) extent of government subsidies,\textsuperscript{75} and 9) costs related to navigating through changing regulatory schemes.\textsuperscript{76}


\textsuperscript{70} See S.C. Pryor & R.J. Barthelmie, Comparison of Potential Power Production at On- and Offshore Sites, 4 WIND ENERGY 173, 173 (2001) (noting that greater consistency in offshore wind speed has implications for the "meshing of technologies"). More consistent offshore wind speeds also reduce "flicker" problems (variations in network voltage) that often decrease customer satisfaction. See E. Bossany et al., Prediction of Flicker Produced by Wind Turbines, 1 WIND ENERGY 35, 35 (1998) (explaining how variations in wind energy can produce disturbances in electrical networks to which wind farms are connected).


\textsuperscript{72} See FUTURE OFFSHORE, supra note 1, at 22 (providing graphs that illustrate how widely wind farm installation costs vary with distance from shore and several other variables).

\textsuperscript{73} See WORLD OFFSHORE RENEWABLES REPORT, supra note 3, at 21 (stating that such "costs may greatly affect a project's overall viability").

\textsuperscript{74} See WIND ENERGY FACT SHEET 1, supra note 13, at 2 (noting that economies of scale can affect the cost of harvesting wind energy).

\textsuperscript{75} Id.

\textsuperscript{76} See discussion infra §5.4.
Another significant variable that affects the long-term competitiveness of offshore wind power is the industry's ability to address fixed costs necessary for competitiveness. In its 2003 report, Our Energy Future, the DTI reported that "[a]lthough the long-term potential looks promising, the economics of offshore wind are very uncertain. In the short-term, there are significant fixed costs before installation can begin. Our program of capital grants has started to address this."77 Although the DTI did not specify which fixed costs make offshore wind energy's short term economics "uncertain," it may have been referring to the expense of developing new vessels specifically adapted to the transport, erection, and installation of offshore wind turbines.78 Other fixed costs that offshore wind power developers must face involve creating or enhancing onshore energy infrastructure in locations where local networks are not sufficient to carry the power produced by a development79 and other equipment necessary to ensure a quality power supply.80

It does not appear that these fixed cost difficulties are insurmountable. The DTI has suggested that the technology necessary to "meet the requirements of offshore" wind farms is already available,61 and the offshore wind power industry will "develop naturally" as soon as there is a "reliable" market for offshore wind power.82 Such language may suggest that consistent

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77 See Our Energy Future, supra note 52, at 58 (suggesting that research, development, and demonstration programs may eventually help to overcome these barriers).
80 Id. at 6 (noting that the cost of a static VAr compensator is significant but "is likely to be manageable within the overall cost of a large scale offshore wind energy project").
82 Offshore Wind Industry Capabilities in the UK, supra note 78, at 3.
demand for offshore wind power will enable the industry to overcome initial fixed costs and become competitive with power derived from fossil and nuclear fuels.

In its projections relating to the growth of the renewable energy section in the United Kingdom, the DTI has indicated that offshore wind power may be the most significant source of renewable energy both in the short-term (2010) and long-term (2025) and suggested that the renewable energy market may supply as much as half of the United Kingdom’s energy needs in the “long-term” at prices below three pence per kW hour. If these projections are correct, offshore wind power may become competitive with power generated from fossil fuel combustion within twenty years. At the present time, the average cost of offshore wind power is likely a few cents per kW hour above that of power derived from fossil fuel.

2.7. Opposition to Offshore Wind Projects

Although offshore wind energy is among the world’s most promising renewable energy options, offshore wind developers have many adversaries, particularly in coastal communities near planned developments. While many national and international environmental groups, including Greenpeace and the Union of Concerned Scientists, generally favor offshore wind farm developments, other groups, including some animal rights activists and local environmental groups, oppose them.

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83 See PROSPECTS FOR THE 21ST CENTURY, supra note 71, at 46-47 (graphing projected cost estimates for achieving renewable energy goals).
84 Id. at 45 (contending that renewable energy sources will continue to be developed over time and hence will be cheaper by 2025).
85 See FUTURE OFFSHORE, supra note 1, at 22 (stating that “the cost of offshore wind farms could fall by up to 50% over the next 20 years, to between 20 and 30 £/MWh. This compares to a current new build cost for combined cycle gas turbines of 18-24 £/MWh.”) (internal citations omitted).
86 See WORLD OFFSHORE RENEWABLES REPORT, supra note 3, § 3.1 (suggesting that the average cost of power from fossil fuel is between three and four cents per kW hour and that the average cost of offshore wind power is approximately five and a half cents per kW hour).
87 As of December, 2002, groups that favored continued review of the Cape Wind project off the coast of Massachusetts included: Greenpeace USA, the Conservation Law Foundation, the National Resources Defense Council, the Union of Concerned Scientists, and MASSPIRG Cape Clean Air. Groups that opposed the development or believed further regulations needed to be put in place included: the Alliance to Protect Nantucket Sound, The Humane Society of the United States, the International Wildlife Coalition, the International Fund for
Opponents of offshore wind farm developments rarely oppose offshore wind power generally. Rather, opponents generally focus on a particular development arguing that although offshore wind power has great potential, it is not appropriate for a specific location. Developers and their supporters often question their opponents' level of commitment to renewable energy and refer to them as "NIMBYs" or Not-In-My-Backyard environmentalists. A project engineer at Cape Wind described public opposition to the project in the following terms:

Most NIMBY's maintain that whatever wind project they are opposing is "misplaced." But, on closer analysis, it appears that the typical NIMBY believes virtually every wind project is misplaced. The typical NIMBY thinks wind projects belong in places where no one can see or hear them, ever, preferably on another planet. The fact that it costs a lot and requires large, ugly, power lines to move power from uninhabited places to distant large cities is of no concern to the typical NIMBY, as long as no line is visible from his/her property/beach/coastal highway.

Of course, opponents of the Cape Wind project have responded that Nantucket Sound is not just any site for a wind farm:

Many of my fellow Cape Codders—fishermen, boaters, preservationists, environmentalists—have vigorously denied the charge that they are being selfish in trying to

Animal Welfare, the Massachusetts Society for the Prevention of Cruelty to Animals, the Ocean Conservancy, and Three Bays Preservation. See John Leaning, Wind-Farm Debate Divides Former Allies, CAPE COD TIMES, Dec. 8, 2002 (discussing the fact that the Cape Wind project has divided groups that are rarely opposed to one another), available at http://www.capecodonline.com/special/windfarm/winddebate8.htm.

88 See, e.g., John Leaning, Cronkite Spins Ad for Foes of Wind Farm, CAPE COD TIMES, Jan. 30, 2003 (observing that Walter Cronkite, who owns a home near the proposed Cape Wind project, has opposed the project and urged that "there must be other places better suited to such a project."). available at http://www.capecodonline.com/special/windfarm/cronkitespins130.htm.


protect Nantucket Sound from 170 of these monstrous towers that reach 426 feet. I, however, have no such hesitation. To the charge of NIMBYism, I proudly plead guilty and encourage anyone who treasures Cape Cod and the still unspoiled beauty of this magnificent natural wonder to join me in my cause.91

Rhetoric for and against offshore wind farm proposals can become vitriolic. According to one columnist for the Boston Globe, the Cape Wind proposal has called "the bluff of every alleged environmentalist on the Cape . . . Will they think globally and act locally on this one? ... Apparently not."92 Unfortunately for government agencies evaluating offshore wind power proposals in the United Kingdom and the United States, the issues are far more complex than this rhetoric suggests.

Offshore wind farms implicate an array of valid concerns, relating to: 1) aesthetic values, 2) tourism, 3) property values, 4) local ecosystems, 5) consistency with other uses of offshore resources (such as fishing and telecommunications lines), 6) navigation safety, 7) aviation safety, 8) private use of public land, and 9) the adequacy of existing regulations to protect against all of these dangers.93 The controversy surrounding offshore wind energy centers not so much on whether these concerns are valid, but on whether the benefits of offshore wind power outweigh the costs.

Many regional, national, and international environmental advocacy groups have joined in support for the Cape Wind Project,94 while several other groups oppose it. One concern that

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92 Allis, supra note 89 (citing critiques against those opposed to construction of wind mills of the shores of Martha's Vineyard, Nantucket, and Craigsville Beach).

93 See Alliance to Protect Nantucket Sound (2003), at http://www.saveoursound.org (arguing that the Cape Wind project would have a wide variety of negative consequences, and that consideration of these consequences should persuade regulators to deny the project's proposals). See also MARTIN J. PASQUALETTI, PAUL GIPE, & ROBERT W. RIGHTER EDs., WIND POWER IN VIEW: ENERGY LANDSCAPES IN A CROWDED WORLD (2002) (discussing the importance of landscape architecture in gaining public approval for wind energy developments).

94 A Cape Cod Times article recently announced that "Clean Water Action,
has led some environmental activists in the United Kingdom and the United States to oppose offshore wind farms is the perception that offshore wind farms negatively impact bird populations, particularly populations of endangered species.\footnote{When a single roseate tern was sighted in the area where Cape Wind has proposed its turbine installation, some scientists called for three years of additional observation. John Leaning, \textit{Bird Experts Say Timing is Key for Windfarm Study}, \textit{Cape Cod Times}, Jan. 3, 2003 (on file with author).}

Perhaps the most helpful publication on collisions between birds and wind turbines in the United States is a National Wind Coordinating Committee ("NWCC") report that summarizes a number of previously existing reports and compares avian mortality related to wind farms with more significant causes of avian mortality.\footnote{The NWCC report estimates that "windplant-related avian collision fatalities probably represent from 0.01\% to 0.02\% (i.e., 1 out of every 5,000 to 10,000 avian fatalities) of the annual avian collision fatalities in the United States. While some may perceive this level of mortality as small, all efforts to reduce avian mortality are important." \textit{Id.} at 2. The report suggests that collisions with wind turbines are negligible even when computations adjust for the fact that there are far fewer wind turbines than other structures with which birds collide. \textit{Id.}} The NWCC report suggests that avian mortality due to collisions with wind turbines is negligible in the overall environmental picture when compared to collisions with vehicles, buildings, and power lines.\footnote{See \textit{Centre for Environment, Fisheries and Aquaculture Science, Department for Environment, Food and Rural Affairs, Offshore Wind Farms: Guidance Note for Environmental Impact Assessment in Respect of FEPA and CPA Requirements 4} (2001) [hereinafter \textit{CEFAS Guidance}] (discussing regulatory review of the environmental impacts of offshore wind farms), available at http://www.cefas.co.uk/publications/files/windfarm%2Dguidance.pdf.}

In the United Kingdom, guidance released by the Center for Environment, Fisheries and Aquaculture Science ("CEFAS"), a division of the Department for Environment, Food and Rural Affairs ("DEFRA") directs offshore wind farm developers to make sure their developments will "maintain or restore certain habitats and species" at acceptable levels.\footnote{National Wind Coordinating Committee, \textit{Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States} (2001), available at http://www.nationalwind.org/pubs/avian_collisions.pdf.}
While public attitudes toward offshore wind power are difficult to gauge, a recent poll commissioned by Cape Wind associates suggests that over half of the residents of the Cape Cod area support the construction of a wind farm in Nantucket Sound, with approximately 35% opposed.\textsuperscript{99} Research conducted under contract with the DTI suggests that public opinion about wind farms is generally strong (and polarized) only in areas where the wind farms can be seen or heard.\textsuperscript{100}

3. ENVIRONMENTAL REGULATION

This Section examines the framework of environmental regulation in which offshore wind developers operate in the United Kingdom and the United States.

3.1. Environmental Regulation in the United Kingdom

The United Kingdom's first offshore wind project, which involved only two offshore turbines, was required to obtain at least ten statutory consents (in addition to a power purchase contract) in order to begin operations.\textsuperscript{101} While the regulation of offshore wind power remains complex, recent developments described below suggest that the environmental consents process may soon be simplified.\textsuperscript{102}

In the United Kingdom, a guidance document issued in 2001 by CEFAS outlined a "simplified" process by which offshore wind farm developers can obtain the statutory consent necessary for the deployment of offshore turbines.\textsuperscript{103} Although the process is

\textsuperscript{99} Another poll conducted by a local environmental advocacy group produced almost the opposite result. John Leaning, Dueling Wind Farm Polls Encourage Skepticism, CAPE COD TIMES, Nov. 12, 2002 (on file with author).


\textsuperscript{102} After this Comment was prepared, the U.K. Department of Trade and Industry ("DTI") published new guidance on the environmental and safety issues implicated by offshore wind farms. See U.K. DEPARTMENT OF TRADE AND INDUSTRY, WIND POWER: ENVIRONMENTAL AND SAFETY ISSUES (2003).

\textsuperscript{103} See CEFAS GUIDANCE, supra note 98, at 4 (providing an overview of the offshore development consents process for wind projects).
anything but simple, it does offer developers a road map, something this Comment suggests developers lack in the United States.

The CEFAS publication ("CEFAS Guidance") observed that there are two routes by which offshore developers could obtain the statutory consent necessary for development. The first of these routes involves certification under the Electricity Act of 1989, an application for a license under § 5 of the Food and Environment Protection Act of 1985 ("FEPA"), and § 34 of the Coast Protection Act of 1949 ("CPA"). The second involves an order under the Transport and Works Act of 1992 ("TWA").

According to the CEFAS Guidance, neither of these paths addresses local regulation. Developers also face local review of their development plans: "other consents may also be required depending on the nature of the site and onshore development proposals." Additional consents were sometimes required under at least the following statutes:

- Town and Country Planning Act of 1990 §§ 57, 90
- Electricity Act of 1989 § 37
- Water Resources Act of 1991 § 109

One of the most serious drawbacks of the first regulatory course is that it leaves the navigational rights of other parties in doubt, raising the possibility that the project will be attacked for impeding navigation in the future.

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104 Id. at 1 ("There are two consents' routes currently available in England and Wales for developers to proceed with offshore wind farm applications.").

105 See Electricity Act, 1989, c. 29 (Eng.) (providing for the registration of electricity producers whose output exceeds certain levels).

106 See Food and Environment Protection Act, 1985, c. 48 (Eng.) (providing broadly for environmental safety and dumping regulations in the United Kingdom and its territorial waters).

107 See Coast Protection Act, 1949, 12, 13, & 14 Geo. VI, c. 74, §34 (Eng.) (providing for restrictions on offshore structures, which may be detrimental to navigation).


109 CEFAS GUIDANCE, supra note 98, at 2.


111 See Electricity Act, supra note 105, § 37 (applying to onshore overhead lines).

112 See Water Resources Act, 1991, c. 57, § 109 (Eng.) (governing the erection of structures over or under a water course).
If a developer decides to take the second regulatory course under the Transport and Works Act of 1992, the CEFAS Guidance suggests that navigation issues are less problematic:

[T]he Secretary of State for Trade and Industry, and in Wales the National Assembly, can make an Order relating to, or to matters ancillary to, the carrying out of works which interfere with rights of navigation in waters within or adjacent to England and Wales up to the seaward limits of the territorial sea.

Although the receipt of such an order does not necessarily mean a developer can begin construction, "when applying for an Order, a developer can at the same time request that planning permission is deemed to be granted." Alternatively, "permission can be sought separately from the Local Planning Authority ("LPA")," under the Town and Country Planning Act of 1990.

The CEFAS Guidance did not simplify the environmental review process; it simply explained it. Not even an order under the Transport and Works Act of 1992, the Guidance explained, could "obviate the need to obtain a FEPA license." And an environmental impact assessment is still generally required in support of all applications.

Recently, the DTI has attempted to streamline the consents process for offshore wind farms. Brian Wilson, the United Kingdom’s former Minister of State for Energy and Construction, has proposed a consultation document that would simplify and clarify the process. The proposal, entitled Future Offshore: A Strategic Framework for the Offshore Wind Industry ("Future Offshore"), would centralize project review within the DTI.

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113 TWA, supra note 108.
114 CEFAS GUIDANCE, supra note 98, at 2.
115 Id.
116 Id.
117 See TCPA, supra note 110, §§ 34, 90 (providing an additional layer of zoning regulation where onshore land use is necessary).
118 See TWA, supra note 108 (providing for a system under which developers within the United Kingdom and its waters may obtain a more streamlined review).
119 CEFAS GUIDANCE, supra note 98, at 2.
120 Id.
eliminate uncertainty about navigational rights under the first permit option described above, and clarify that the role of local planning authorities is limited to the mean low water mark of their shores.121

*Future Offshore* also promises that the DTI will expand its focus beyond the United Kingdom's territorial sea:

[We will] bring forward legislation as soon as possible to enable the granting of licenses for offshore wind farm developments beyond territorial waters. We will identify and assess the difficulties that might be posed for aviation and other military and civil interests before we offer areas of the sea to the wind industry for development.122

Such legislation would permit developers to access a far broader array of sites, but at the cost of longer transmission lines and, depending on the locations at issue, greater water depths.

It is uncertain what changes the British government will make in response to the comments it has received on its *Future Offshore* proposal. Although the DTI received many comments from the industry that favored a streamlined process spearheaded by the DTI, comments received from environmental conservation groups, local planning authorities, and government entities tended to favor slow progress and environmental analysis of each proposed development.123 In any event, it seems unlikely that the DTI will relinquish its statutory authority in light of responses to *Future Offshore*. In its summary of responses to its *Future Offshore* consultation, the DTI stated:

DTI's envisaged role flows from the existing regime under

121 See *Future Offshore*, supra note 1, at 67-69 (discussing the proposal and raising the issue of whether primary legislation may be necessary for appropriate changes to be made).

122 *Our Energy Future*, supra note 52, at 56.

Section 36 of the Electricity Act 1989 for handling development consents for power stations of generating capacity above 50 MW in England and Wales including territorial waters. DTI is the lead department for electricity generation and the issues raised in considering Section 36 applications include the visual impact of the proposed facility, particularly as it affects sensitive designated areas such as National Parks, and its effects on humans.\textsuperscript{124}

Given this strong stance on its own role in the environmental review process, the DTI is likely to retain its hegemony in the offshore wind energy environmental review process. Changes may result, however, from comments that suggest more coordination with other government bodies and public involvement.\textsuperscript{125}

3.2. Environmental Regulation in the United States

In the United States, controversy surrounds the environmental regulation of offshore wind energy projects planned for federal waters. Among the controversial issues at stake are the following: 1) where federal and state jurisdiction meet and/or overlap; 2) how existing environmental regulations should be applied to offshore wind energy developments; and 3) how environmental permitting and land use permitting relate to one another.

When the USACE awarded Cape Wind the necessary permit to construct a scientific measuring devise station ("SMDS") on the continental shelf at the location of the proposed wind farm, groups opposed to the wind farm filed at least two separate suits attempting to invalidate the permit. Although these suits related primarily to the SMDS and not to the proposed wind farm itself, the cases implicated all three of the environmental regulation issues mentioned in the previous paragraph. Judge Tauro of the United States District Court for the District of Massachusetts has recently dismissed two suits, suggesting answers to some of these

\textsuperscript{124} See Government Response to Proposed Consents Process, \textit{supra} note 123, at 4 (responding to critiques of the DTI's leadership role in offshore wind permitting).

\textsuperscript{125} See id. at 5 ("The new 'streamlined' consents process will provide for all relevant information to be gathered and relevant bodies consulted before the consenting authorities take their decisions.").
debated issues.\textsuperscript{126}

3.2.1. Federal and State Jurisdiction

The question of when federal and/or state environmental laws apply to a given project has been a key issue in the legal battle surrounding the proposed Cape Wind project. The question can be particularly difficult when a project is planned for federal waters but would have a visual or other effect on waters under state jurisdiction or when a project involves the landfall of transmission wires on state shores. In the case of the Cape Wind project, the relevant jurisdictional issues have been further complicated by federal legislation that delegates authority to the Commonwealth of Massachusetts to regulate fishing in a "pocket" of federal waters within Nantucket Sound.\textsuperscript{127}

In his August 19, 2003 opinion ("Cape Wind I"), Judge Tauro ruled that Cape Wind did not need to undergo an environmental review under Massachusetts fisheries regulations and obtain a license from the Commonwealth in order to construct its SMDS in federal waters within Nantucket Sound.\textsuperscript{128} Although Judge Tauro acknowledged that the amended Magnuson-Stevens Fishery Conservation and Management Act\textsuperscript{129} delegated authority to the Commonwealth to determine "who may fish, by what means they may fish, and how much they may fish,"\textsuperscript{130} in Nantucket Sound, he denied that anything in the statute "supports the proposition that regulating non-fishing activities simply for the protection of fish


\textsuperscript{127} See 16 U.S.C. § 1856(a)(2) (2000) (stating that "[f]or the purposes of this chapter . . . the jurisdiction and authority of a State shall extend—(A) to any pocket of waters that is adjacent to the State and totally enclosed by lines delimiting the territorial sea of the United States . . . ; [and] (B) with respect to the body of water commonly known as Nantucket Sound, to the pocket of water west of the seventieth meridian west of Greenwich."); see also Cape Wind I, supra note 126, at 4 (citing this state jurisdiction statute).

\textsuperscript{128} See Cape Wind I, supra note 126, at 5 (arguing that Massachusetts lacked the jurisdiction to impose these requirements).


\textsuperscript{130} See Cape Wind I, supra note 126, at 5.
falls under the Commonwealth's jurisdiction."\textsuperscript{131}

Although Cape Wind I was something of a victory for Cape Wind, the decision has few implications for the broader jurisdictional questions involved in offshore wind power. First, the Magnuson-Stevens Fishery Conservation and Management Act's delegation of certain powers to the Commonwealth of Massachusetts was specific to Nantucket Sound.\textsuperscript{132} Second, the case involved only a data collection tower and not an actual offshore wind harvesting facility. Accordingly, the case failed to address an important issue related to offshore wind farms planned for federal waters: May state and local governments use their authority to regulate transmission cables on their land and in their waters to regulate (or block) entire offshore wind farms planned for federal waters?\textsuperscript{133} In the absence of some ruling on this issue, important jurisdictional (and political) issues remain for the offshore wind energy industry.

3.2.2. Application of Existing Environmental Regulations

In a second case involving the Cape Wind project ("Cape Wind II"), the Alliance to Protect Nantucket Sound ("Alliance") requested that Judge Tauro invalidate Cape Wind's USACE permit to build a data collection tower.\textsuperscript{134} The Alliance argued that the permit was invalid primarily on three grounds, two of which related to environmental regulation. The Alliance alleged that: 1) "the Corps lacked the authority to issue a Section 10 permit for activities on the OCS [outer continental shelf] unrelated to the extraction of resources from the seabed" and 2) that "the Corps failed in a variety of ways to satisfy its obligations under the National Environmental Policy Act."\textsuperscript{135}

\textsuperscript{131} \textit{Id.}

\textsuperscript{132} \textit{Id.}

\textsuperscript{133} See John Leaning, \textit{Projects Must Survive Local Scrutiny}, \textit{CAPE COD TIMES} (Dec. 10, 2002) ("The undersea cable bringing electricity from the [Cape Wind] facility to land will go under and through wetlands, triggering review by a local board charged with enforcing the state's Wetland Protection Act and any other municipal wetland protection bylaws.") (on file with author). Leaning's article provides an interesting account of how local officials in Ocean City, Maryland have attempted to use their authority to regulate the landfall of cables to block an offshore wind farm or force developers to build in waters farther from shore. According to one local official, the wind farm (not the cables) was the real issue.

\textsuperscript{134} See Cape Wind II, \textit{supra} note 126.

\textsuperscript{135} \textit{Id.} at 3. The Alliance also made an argument based on land use considerations. That argument is omitted here but discussed under § 3.2.3.
Judge Tauro rejected both of these claims, adopting the reasoning of an amicus curiae brief filed by the Conservation Law Foundation ("CLF"). The CLF amicus brief argued that federal law authorizes the USACE to perform an environmental review of offshore wind projects and that review under the National Environmental Policy Act ("NEPA") is sufficient to protect the public from environmental dangers. Judge Tauro agreed that, under Section 10 of the Rivers and Harbors Act of 1899 ("RHA") and Section 4(f) of the Outer Continental Shelf Lands Act ("OCSLA"), the USACE has the authority to review the environmental impact of all improvements on the continental shelf regardless of purpose.

Section 10 of the RHA provides sweeping language that would seem to require USACE approval for virtually any structure to be placed in "water of the United States." The RHA provides in pertinent part that:

> [t]he creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is prohibited; and it shall not be lawful to build or commence the building of any... structures in any... water of the United States..., except on plans recommended by the Chief of Engineers and authorized by the Secretary of the Army.

Judge Tauro noted that OCSLA extended the USACE's authority to the outer continental shelf ("OCS") and rejected the Alliance's contention that a 1978 amendment to OCSLA was intended to limit the USACE's jurisdiction over projects on the

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136 Brief of Amicus Curiae Conservation Law Foundation; Alliance to Protect Nantucket Sound v. United States Dep't of the Army, No. 02-11749 JLT (D. Mass. Jan. 15, 2003) [hereinafter CLF Amicus Brief].

137 Id. at 6 (citing National Environmental Policy Act, 42 U.S.C. § 4321 et seq. (2000)).


140 Cape Wind II, supra note 126, at 12-13.


142 Id.

143 Cape Wind II, supra note 126, at 14-18 (citing 43 U.S.C. § 1333(e) (2000)).
Although Judge Tauro declined to comment on the CLF brief’s assertion that NEPA provides adequate protection against dangers to the environment, he seemed frustrated that the Alliance would question the statute’s adequacy in the context of a mere data tower permit (not a permit authorizing an entire wind farm). He stated:

[I]t is useful to review precisely what the [USACE’s] data tower permit sanctioned. The permit granted Cape Wind the right to locate and operate a data tower . . . . The permit provides for and regulates both the placement and removal of the tower . . . . Significantly, the permit does not grant Cape Wind the right to construct a wind energy plant.145

Judge Tauro avoided expressing an opinion on whether NEPA provides an adequate environmental review framework for offshore wind energy, but CLF has argued persuasively that NEPA does provide such a framework.146

NEPA’s “twin aims,” CLF pointed out in its amicus brief, are “to ensure that the agency takes a ‘hard look’ at the environmental consequences of its proposed action and to make information on the environmental consequences available to the public, which may then offer its insight to assist the agency’s decision-making through the comment process.”147 While NEPA applies to environmental review for gas and oil drilling on the OCS, its “great strengths are its applicability and adaptability to a broad range of projects and circumstances.”148 Under Section 10 of the Rivers and Harbors Act of 1899, for instance, an agency must “analyze and take into account the environmental considerations set forth in NEPA.”149

If NEPA has created a flexible framework sufficient to evaluate the environmental impacts associated with oil and gas drilling on

144 Id. at 14 (citing 43 U.S.C. § 1333(a)(1) (2000)).
145 Id. at 22.
146 CLF Amicus Brief, supra note 136, at 6.
147 Id. (quoting Dubois v. United States Dept. of Agric., 102 F.3d 1273, 1285-86 (1st Cir. 1996)).
148 Id. at 7.
149 CLF Amicus Brief, supra note 136, at 7 (quoting United States v. Kane, 461 F. Supp. 554, 558 (E.D.N.Y. 1978)).
the OCS,\textsuperscript{150} that framework is arguably sufficient to evaluate the environmental impact of an offshore wind farm, a land use with similar navigational and aviation risks but significantly fewer environmental risks.\textsuperscript{151}

The contention that existing environmental regulations are not sufficient is further belied by the degree of regulatory attention Cape Wind has already attracted. As Cape Wind I and II were being litigated, state and federal agencies were coordinating to submit Cape Wind to one of the most rigorous environmental reviews of any pending development project under both federal\textsuperscript{152} and state\textsuperscript{153} environmental regulations. Due to the complexity of the analysis required for its final decision, the USACE has stated that it does not expect to issue a final order on Cape Wind’s permit application until at least July 2004.\textsuperscript{154}

In Cape Wind II, Judge Tauro not only dismissed the Alliance’s claim that the USACE had no jurisdiction to issue a permit for the SMDS, he also dismissed the Alliance’s claim that the USACE had violated its obligations under NEPA.\textsuperscript{155} NEPA requires federal agencies to “consider the potential environmental consequences of

\textsuperscript{150} See 43 U.S.C. § 1331(a) (2000) (establishing federal jurisdiction over submerged lands more than three miles off the United States coast).

\textsuperscript{151} Offshore wind farm operations pose significantly less environmental risk, because the “fuel” used by wind farms, air, is nontoxic. See CLF Amicus Brief, supra note 136, at 7 (referencing Edwardsen v. United States Department of the Interior, 268 F.3d 781, 784 (9th Cir. 2001), which held that the United States Minerals Management Service, in an EIS prepared pursuant to NEPA for an oil and gas development project, took the requisite “hard look” at environmental impacts).

\textsuperscript{152} The EPA has issued detailed comments to the USACE relating to the Environmental Impact Statement it is required to file in combination with its decision regarding the Cape Wind project. See Letter from Robert W. Varney, Regional Administrator, U.S. Environmental Protection Agency, to Brian E. Osterndorf, District Engineer, Army Corps of Engineers (Apr. 5, 2002) (providing recommendations to the USACE for the scope of the draft Environmental Impact Statement), available at http://www.epa.gov/region1/NEPA/pdfs/NEPAScoping_Final.pdf.

\textsuperscript{153} See Certificate of the Secretary of Environmental Affairs on the Environmental Notification Form, Massachusetts Environmental Protection Agency (Apr. 22, 2002) (addressing state environmental concerns including the proposed landfall of transmission lines on Massachusetts soil), available at http://www.state.ma.us/envir/mepa/downloads/12643cert.doc.

\textsuperscript{154} See Leaning, Wind Farm Decision At Least Year Away, supra note 6 (quoting Karen Adams, Project Manager for the Cape Wind evaluation, as saying, “[i]t will take more than a year to get to the permit decision”).

\textsuperscript{155} Id. at 22-29 (citing 42 U.S.C. § 4321 et seq. (2000)).
proposed projects before allowing them to proceed.”

Deferring to the USACE’s interpretation of its own regulations and the statutes it enforces, Judge Tauro found that the USACE had not violated its obligations under NEPA by: 1) not circulating its Environmental Assessment (“EA”) and Finding of No Significant Impact (“FONSI”) for public comment; 2) failing to consider alternatives to the SMDS; 3) reviewing the SMDS application separately from the wind farm application; or 4) failing to consider the environmental effects of the removal of the tower.

Although Cape Wind II did not directly involve a permit to construct a wind farm, its implications for offshore wind projects in the federal waters of the United States are clear. At least one court has held that the USACE has the authority to conduct environmental reviews and issue permits for improvements of almost any sort on the OCS, presumably including offshore wind farms.

3.2.3. Relationship of Environmental and Land Use Regulation

In Cape Wind II, the Alliance argued that the USACE permit was invalid not only for reasons related to environmental regulation, but also because the USACE “knew that Cape Wind did not have and could not obtain the property interest in OCS lands that, according to [USACE] regulations, it needed to undertake construction of the data tower.” Judge Tauro’s dismissal of this claim fills only parts of three pages in the Cape Wind II slip opinion, but it is arguably more important than his discussion of either of the Alliance’s environmentally related claims.

Judge Tauro roundly rejected the Alliance’s claim that the USACE’s regulations require an applicant for a permit to have or be able to obtain a property interest in the OCS lands on which it seeks to construct an improvement. The court noted that the USACE regulations contemplate that the USACE will not enter into

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156 Cape Wind II, supra note 126, at 7 (citing 42 U.S.C. § 4331(a) (2003)).
157 Id. at 10 (quoting 5 U.S.C. § 706(2)(A) (2001): “[u]nder the [Administrative Procedure Act], a decision of an agency will be set aside only if it is found to be ‘arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law’”).
158 Id. at 23.
159 Id. at 3.
160 Id. at 20-22.
property disputes and that a construction permit from the USACE does not authorize an applicant to violate public or private rights.\textsuperscript{161} These relevant regulation states:

A [USACE] permit does not convey any property rights, either in real estate or material, or any exclusive privileges. Furthermore, a [USACE] permit does not authorize any injury to property or invasion of rights or any infringement of Federal, state or local laws or regulations. The applicant's signature on an application is an affirmation that the applicant possesses or will possess the requisite property interest to undertake the activity proposed in the application. The [USACE] will not enter into disputes but will remind the applicant of the above. The dispute over property ownership will not be a factor in the [USACE's] public interest decision.\textsuperscript{162}

Given this regulation's focus on property rights, the "rights" that a permit does not authorize an applicant to violate presumably include property rights.

Cape Wind II suggests strongly that a USACE order that permits an applicant to make improvements on the OCS does not, in and of itself, authorize such improvements. Cape Wind II offers no conclusions about whether any such authorization is required by other law.\textsuperscript{163}

3.3. Comparison of Environmental Regulatory Frameworks

There are significant similarities between the ways in which the United Kingdom and United States review the potential environmental impact of proposed offshore wind farm developments. Both nations employ a complex process in which regulators must analyze almost every conceivable environmental effect and then decide whether the benefits of a proposed development outweigh its liabilities. In both nations, local authorities play some role, the boundaries of which role are somewhat fuzzy.

\textsuperscript{161} Id. at 21.

\textsuperscript{162} Id. at 21 (quoting 33 C.F.R. § 320.4(g)(6) (2003)).

\textsuperscript{163} For more information on land use regulation in the United States, see infra § 4.2.
4. LAND USE REGULATION

This Section compares the regulatory frameworks that govern offshore wind power in the United States and the United Kingdom. Although land use planning may be one of the most treacherous development stages for offshore wind power in both the United States and the United Kingdom, recent developments in the United Kingdom have opened the door for a streamlined evaluation of possible sites.

4.1. Land Use Regulation in the United Kingdom

The Crown Estate, the agency that administers the royal family’s land in the United Kingdom, has dominion over most of the United Kingdom’s territorial waters (waters within twelve nautical miles of shore) regardless of the type of use at issue. Thus, there is no uncertainty about which arm of the Government must award offshore wind developers their leases and there is no uncertainty once a lease has been obtained that the correct authority has contracted for it.

With an invitation for offshore wind farm proposals in December of 2000, the Crown Estate provided potential developers with a guidance document entitled Crown Estate Procedures for Grant of Agreements for Offshore Windfarm Development Sites (“Crown Estate Procedures”).

Crown Estate Procedures spelled out three steps developers were required to take in order to secure a seabed lease during the first round: 1) prequalification, 2) site allocation, and 3) grant of an Agreement for Lease. Prequalification required a showing of adequate financial and technical credentials, submission of a proper development plan, a financial deposit, and information about the ownership of the applicant entity. Interestingly, developers were left to propose their own locations and perform their own analyses of compatibility with other uses of the lands.

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164 See Press Release, The Crown Estate, What is the Crown Estate? (noting that the Crown Estate includes all of the seabed around the United Kingdom out to the 12 mile limit), at http://www.crownestate.co.uk/info/about.shtml (last modified Apr. 8, 2003).


166 Id. at 1.

167 Id. at 2-4.
and waters in question, subject to Crown Estate review.\textsuperscript{168}

The Crown Estate announced in April 2001, that it had approved the applications of eighteen developers to pre-qualify for leases of thirteen seabed locations within the territorial sea of Great Britain.\textsuperscript{169} As of the end of 2002, at least twenty developers had reached conditional agreements with the Crown Estate to lease wind farm sites.\textsuperscript{170} Additional consents will be necessary before many of these developers can commence construction\textsuperscript{171} and no developer is required to sign a final lease agreement until it has secured all applicable regulatory consents.\textsuperscript{172}

In 2003, the Crown Estate opened a "second round" of offshore site allocations following a modified procedure under which developers continued to propose their own sites, but did so within areas selected by the DTI pursuant to a Strategic Environmental Assessment ("SEA") conducted by the DTI to evaluate possible sites within three regions.\textsuperscript{173} Twenty-nine companies registered their interest in obtaining "round two" site allocations and are, at the time of this writing, competing for locations on which to construct offshore wind farms.\textsuperscript{174}

Although uncertainties remain in the regulatory scheme that governs the use of offshore land for wind power generation in U.K. waters, these uncertainties, insofar as they are regulatory uncertainties, pertain primarily to future projects that may seek to exploit wind resources beyond the United Kingdom’s territorial

\textsuperscript{168} Id. at 5; see also Mark Rogers, \textit{Is Cape Cod Times in the Alliance’s Pocket?}, CAPECODTODAY.COM (Sept. 10, 2003) ("[T]he UK selected these three strategic areas for offshore wind based largely upon the preference of developers as the areas having the greatest commercial potential."); http://www.capecodmedia.com/cctoday.php?sid=152 (last visited Oct. 9, 2003).


\textsuperscript{170} See FUTURE OFFSHORE, supra note 1, at 4.

\textsuperscript{171} See id. (distinguishing between the granting of leases and other consents).

\textsuperscript{172} See id. § 3.2 (noting that this permits developers to have some degree of security about their proposed sites while their proposals undergo regulatory review).

\textsuperscript{173} See CROWN ESTATE, ROUND 2 PROCEDURES UNDER WAY: STAGE 3 (2003) (noting that the DTI evaluated sites in the Thames Estuary, the Wash, and Liverpool Bay) (on file with author).

\textsuperscript{174} Developers are required to submit "tenders" for locations, including full business plans, by October 15, 2003. The results of the competitive process are expected in November, 2003. Id.
seas. Of course, economic uncertainties remain, particularly those related to whether the DTI will be able use the SEA procedure to select sites with sufficient wind resources.  

4.2. Land Use Regulation in the United States

Although the United States currently has a framework of environmental regulations that is arguably sufficient to evaluate the environmental impact of offshore wind farms, it has little that could be called a regulatory framework to address whether, and under what conditions, such developments may be placed in federally controlled waters. This regulatory vacuum may result from the fact that, in federal waters, United States administrative agencies govern the use of "submerged lands" according to functional categories like oil drilling and nonprofit scientific endeavors. Large-scale offshore wind farms may simply be so new that the United States has no agency statutorily authorized to lease public land to offshore wind developers.

Under-regulation of offshore land use in the United States has encouraged citizen groups to use a number of tactics to delay regulatory review of the Cape Wind Project. The Alliance to Protect Nantucket Sound has been particularly active in attempting

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175 FUTURE ONSHORE, supra note 1, at 34.
176 See GOVERNMENT RESPONSE TO PROPOSED CONSENTS PROCESS, supra note 123, at 3 (noting "some concern over whether adequate resources would be available").
177 See CLF Amicus Brief, supra note 136, at 11-13 (arguing that Congress should pass comprehensive legislation aimed at eliminating uncertainty about land use issues for offshore wind farm projects and arguing that land use regulation does not necessarily involve ceding "ownership" of federal waters to private parties); see also Letter from Douglas C. Yearly, Alliance to Protect Nantucket Sound, to Honorable James L. Connaughton, Chairman, Council on Environmental Quality (Aug. 27, 2003) (arguing that the United States presently lacks an effective and environmentally safe land use scheme for developing offshore wind resources), available at http://www.saveoursound.org/downloads/preskit/EIS803/PEISEurope03.pdf.
178 Steven Koff, Offshore Wind Power Plans Blow Rift Through Cape Cod, NEWHOUSE NEWS SERV. (Sept. 26, 2003) ("The only agency that has final say on a precious ocean resource is the one that deals with dock and dam issues."), available at http://www.newhousenews.com/archive/koff092903.html.
to exploit land use issues to stall federal and state *environmental* reviews until a more developed framework for land use allocation can be implemented.\textsuperscript{180}

In the United States, several legislative proposals have sought to address land use issues relating to offshore wind farms, but to date the issue remains unresolved. During the One Hundred and Seventh Congress, Representative Cubin of Wyoming proposed a bill that would have given the Secretary of the Interior authority to establish a procedure whereby private parties could lease or otherwise obtain access to federal lands on the OCS through a competitive bidding or other process.\textsuperscript{181} Although the Subcommittee on Energy and Mineral Resources of the House Resources Committee held a hearing on the bill, it never materialized into legislation.\textsuperscript{182}

During the One Hundred and Eighth Congress, at least one proposal directly addressed the land use problems faced by the offshore wind energy industry: House Bill 1183, proposed by Congressman William D. Delahunt of Massachusetts.\textsuperscript{183} Although the proposal is named "The Coastal Zone Renewable Energy Promotion Act of 2003," it is uncertain whether the bill would have promoted renewable energy in the coastal waters of the United States. The proposal directs the Secretary of Commerce acting through the Administrators of the National Oceanic and Atmospheric Administration ("NOAA") to license offshore renewable energy facilities.\textsuperscript{184} But, without explanation as to why renewable energy facilities should undergo more harsh scrutiny than other developments on the OCS, the bill provided for what amounted to a heightened or redundant environmental scrutiny before the licensure of facilities.\textsuperscript{185} Licensure was to be based on

\textsuperscript{180} *See id.* (noting that James Gordon, president of Cape Wind, commented that the alliance keeps attempting to delay environmental reviews).

\textsuperscript{181} H.R. 5156, 107th Cong. (2002); *see also* CLF Amicus Brief, supra note 136, at 11.

\textsuperscript{182} CLF Amicus Brief, *supra* note 136, at 11.

\textsuperscript{183} *See* Coastal Zone Renewable Energy Promotion Act of 2003, H.R. 1183, 108th Cong. § 314(c) (directing the Secretary of Commerce to "consider the amount of energy the proposed project will produce, the economic impact to the region where the facility will be located, the environmental impacts of the proposed facility, the displacement of competing uses of the proposed site and other relevant factors to determine which proposed project best serves the public interest").

\textsuperscript{184} *Id.* § 314(d).
the approval of other agencies and a series of vague conditions such as consistency with state coastal management programs.\textsuperscript{186}

In addition to these proposals, both the Senate and the House of Representatives are, as of this writing, considering different versions of an omnibus energy bill that may or may not have significant ramifications for the offshore wind energy industry in the United States.\textsuperscript{187}

4.3. \textit{Comparison of Environmental Regulatory Frameworks}

The United Kingdom's land use regulations applicable to offshore wind farms offer at least two advantages over the regulatory vacuum in the United States.\textsuperscript{188} First, although specific lease terms may vary in the United Kingdom, land use costs in the United Kingdom are far more predictable than in the United States, because there are no existing offshore wind-related lease agreements, and therefore no cost data, available in the United States.\textsuperscript{189} Secondly, as noted above, developers who have secured a site can design their turbines to fit the site and commence the relevant environmental reviews with some confidence that their investment will not be lost because of land use uncertainties.

5. \textit{Explaining the Development Gap}

This Section argues that uncertainties about land use laws in the United States explains much about why the offshore wind

\textsuperscript{185} See\textit{id.} § 101 (providing for environmental review of potential impacts on the marine environment).

\textsuperscript{186} Id. § 201.


\textsuperscript{188} The Alliance to Protect Nantucket Sound has argued that the United Kingdom should serve as a model for the United States in regulating the use of public land for offshore wind development, but the Alliance has failed to recognize the extent of private sector involvement in the site selection process in the United Kingdom. See Rogers,\textit{supra} note 168; Letter from Douglas C. Yearly,\textit{supra} note 177.

\textsuperscript{189} The DTI has suggested that Crown Estate rents will comprise approximately 2% of the total cost of a 100 MW wind farm in the United Kingdom's territorial waters. See Future Offshore,\textit{supra} note 1, § 2.2 (providing a "pie graph" depicting relevant costs).
power industry has grown more successfully in the United Kingdom than in the United States. It suggests that these uncertainties, not international under-regulation, differences in offshore wind resources, or renewable energy portfolio requirements, explain the gap between the industry’s growth in the United Kingdom and stagnation in the United States.

5.1. International Under-Regulation?

The international context for offshore wind power regulation in the United Kingdom is significantly different from the context in the United States and may have provided the impetus behind the United Kingdom’s decision to create a regulatory review process tailored to its offshore wind energy industry. Both the United States and the United Kingdom have signed international agreements related to climate change, but the United Kingdom has arguably subjected itself to more strenuous renewable energy obligations.

The Kyoto Protocol to the United Nations Framework Convention on Climate Change is a treaty calling for large-scale reductions in carbon dioxide and other greenhouse gas emissions. While both the United States and the United Kingdom have signed the treaty, only the United Kingdom has ratified it, leaving the obligations of the United States under the treaty somewhat unclear. In addition, only the United Kingdom is subject to European Union energy policy directives and regulations that call for 12% of all electricity generation to come from renewable energy sources by the year 2010. The United States has submitted itself to no comparable obligations.

5.2. Differences in Offshore Wind Resources

It may be tempting to explain the United Kingdom’s great

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190 See Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, Status of Ratification (providing an up-to-date list of nations which have signed or ratified the agreement), available at http://unfccc.int/resource/docs/convkp/kpeng.pdf.

191 Id.

192 FUTURE OFFSHORE, supra note 1, at 30.

193 At least one recent bill, however, has proposed that the United States adopt a “portfolio” standard analogous to that in existence in the United Kingdom. See Energy Policy Act of 2003, H.R. 6, 108th Cong. § 264 (2003) (establishing a “minimum renewable generation requirement”).
success in the offshore wind power industry by appealing to differences in the available offshore wind resources in United Kingdom and United States waters. But wind resource comparisons do not explain why U.S. developers have not been able to clear the permit process. Whatever the available resources, developers in both nations have obviously determined that they are sufficient to fuel profitable wind farms. Whether or not their financial projections prove accurate, developers in the United States have thus far not even succeeded in obtaining permission to attempt to turn a profit.

5.3. Renewable Energy Portfolio Requirements

Another tempting explanation for the United Kingdom's success in the offshore wind energy industry may be the United Kingdom's "portfolio" requirements that have imposed on its electricity suppliers. In the United Kingdom, electricity suppliers must provide 10% of their electricity from renewable energy sources by 2010.194 There is no parallel obligation in the United States, although several states, including Massachusetts,195 have imposed renewable energy obligations. Although differing portfolio requirements may have some bearing on the demand for and profitability of offshore wind energy, differences in portfolio requirements are unlikely explanations for why offshore wind farms proposed for U.S. waters have failed to clear even the site selection stages of development.

5.4. The Prohibitive Cost of Regulatory Uncertainty

It has been said that "the power to regulate can constitute the power to destroy."196 But the experience of the offshore wind

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196 Daniel F. Spulbur & Christopher S. Yoo, Access to Networks: Economic and Constitutional Connections, 88 CORNELL L. REV. 885, 944 (2003) (noting that courts in the United States have recognized this principle in the related contexts of
power industry in the United States and United Kingdom suggests that under-regulation and resultant regulatory uncertainty can prove every bit as devastating as over-regulation.  

Regulatory uncertainty caused by under-regulation is one of the major economic costs of offshore wind power in the United States. As Warren G. Lavey has observed in the context of the telecommunications industry, regulatory uncertainty is a significant expense for many companies:

Both regulated and unregulated businesses face uncertainties about factors such as market demand, technology changes, supply costs, and competitors’ strategies. For businesses in regulated industries, uncertainty about future regulations can add to difficulties of companies in attracting capital and making investments in infrastructure, products, and services. Business plans are developed with long-term assumptions about a wide range of factors, some of which are heavily influenced by regulators. While regulators require or induce carriers to spend billions of dollars annually on networks and offerings, regulators also often preserve the flexibility of present and future commissioners to shape future regulations, which will determine in substantial part the carriers’ returns on these investments. The business uncertainty for carriers resulting from such regulatory flexibility can impose costs on carriers in terms of less productive use of resources and lost opportunities.  

Faced with uncertainty about future regulatory environments, companies often avoid risky, but potentially profitable and/or environmentally beneficial, investments.

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198 Id. at 3.

199 Id. at 7 (“[W]hen facing plausible scenarios with different strategic implications, companies can: bet on the most probable scenario; bet on the most advantageous scenario; hedge through a strategy that produces satisfactory results under all scenarios (usually implying higher costs or lower revenues than a betting strategy); preserve flexibility by delaying commitments (often sacrificing
Regulatory uncertainty is particularly problematic in the offshore wind energy industry because turbine design is site-specific. Turbines generally cannot be profitable without rotor and generator designs that are directed precisely at a specific environment.200 Foundation designs are also site-sensitive.201 Since developers of site-specific technology cannot be certain as to the location of their future offshore wind farms, they must investigate the characteristics of multiple sites while at the same time creating multiple turbine optimization plans.202 Perhaps for this reason, the CLF has suggested that the absence of an administrative framework governing resources on the OCS "may create a disincentive to developing innovative renewable energy projects."203

6. CONCLUSION

While offshore wind power is one of the most promising renewable energy options available, regulatory uncertainties relating to land use have largely halted the offshore wind industry's progress in the United States. In the United Kingdom, however, at least twenty offshore wind projects received preliminary permission to obtain leases from the Crown Estate. Unless the United States addresses the regulatory uncertainties surrounding land use permits for offshore wind farms, it may not be possible for an offshore wind farm to ever be constructed in U.S. waters.

first-mover advantages); or use resources to influence the causal factors behind the scenario variables.


201 See OFFSHORE WIND INDUSTRY CAPABILITIES IN THE UK, supra note 78, at 4 (stating that "foundation design is site specific and depends crucially on the local sea bed conditions which prevail").


203 CLF Amicus Brief, supra note 136, at 11.