

## Cape Cod Offshore Wind Park, the Multivariate Nature of Energy Policy Issues.

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Picture courtesy of Cape Wind Associates LLC

### MAIN PAGE

Audra Parker, Assistant Director of “Save Our Sound” an Alliance to protect Nantucket Sound, full time resident of Barnstable County, economist, and mother of four children is crystal clear on the issue: *“this is not an issue of ‘classy’ rich people behaving typically in a stereotype NIMBY reaction. The area has an average income distribution. We are extremely worried about the economic base of the area, about public safety and about the environment”* (personal conversation).

The “we” she represents includes a variety of interests such as fishermen, Chambers of Commerce, local environmental groups or local officials (see below, Section III).



Nantucket Sound (from Kalmus Beach Park, near Hyannis town center. Picture by E. Alonso & A. Recarte)



How the turbines would look from 3-5 miles away (courtesy from Cape Wind Associates LLC)

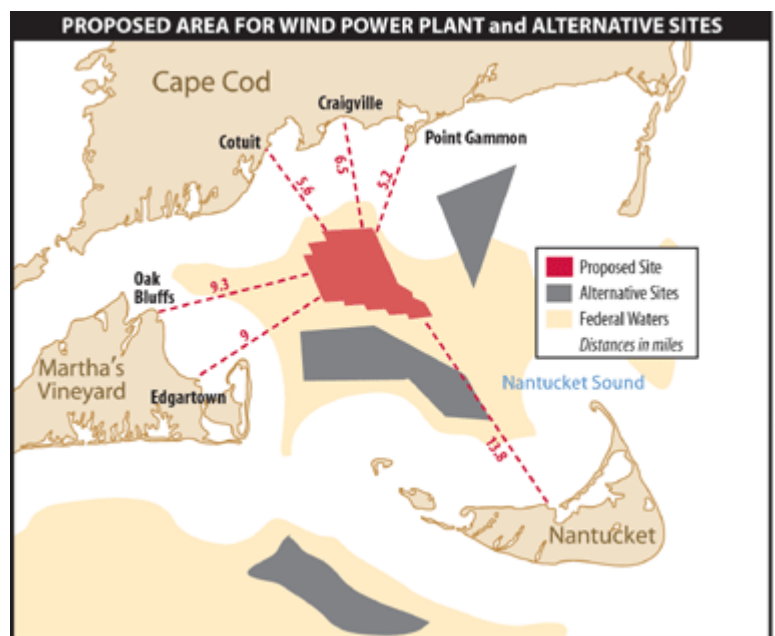
The members of the Alliance are not alone. Some national environmental NGOs, such as the International Wildlife Coalition, are backing them too. The Alliance claims to

have 30,000 supporters (on its database) who request information, attend events or get interactive communication. 500 of them are financial contributors. Some via mailing, most through small events (house events), in which contributions are collected.

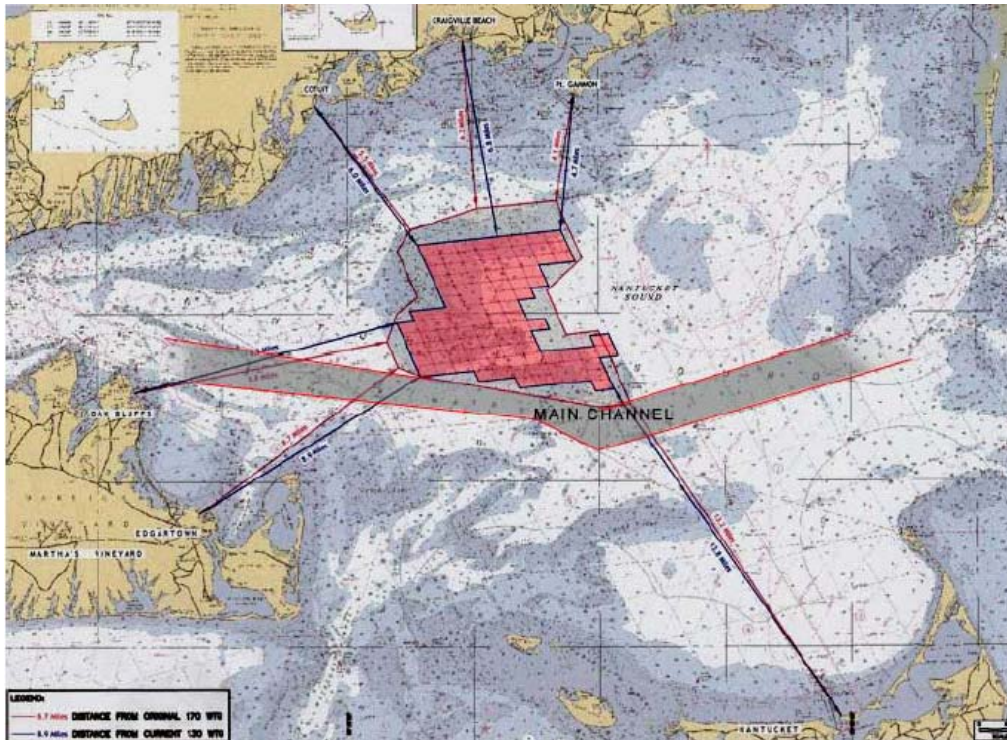
The “issue” which she is addressing is the so-called **Cape Wind Project**, “a controversial proposed offshore wind farm on Horseshoe Shoal in Nantucket Sound, off Cape Cod in Massachusetts. 41.543° N 70.321° W. If the project moves forward on schedule, it would become the first offshore wind farm in the United States” which has reached global celebrity as a symbol of debates to happen worldwide (Wikipedia).

### I.- The project.

The project will have 130 wind turbines, each of them 260 feet (80m) high –at hub height- and 426 feet (130m) at the blade tip height. The turbines would be sited 4 miles offshore, visible on the horizon as half an inch high (see previous picture). At peak generation, the turbines will generate 420-454 megawatts of renewable electricity. The grid spacing [ see maps below ] of the turbines would be approximately 1/2 by 1/3 mile, a minimum of 0.34 nautical mile (629 meters) x 0.56 nautical mile (1,000 meters), “a sufficient spacing within or around the array allow for the continuation of traditional uses of the sea such as general commercial and recreational navigation, commercial and recreational aviation, commercial and recreational fishing, and other traditional water-based activities that promote the use and enjoyment of this area of Nantucket Sound.” (Application for MMS leasehold, project overview). The total area to be occupied would be approximately 25 square miles, although it has an additional perimeter since “Cape Wind has voluntarily proposed to lease the additional area in order to preclude the lease and/or construction of any structures directly adjacent to the Project Area which could impact the wind or impede the current use of the watersheet area.” (MMS Leasehold Application: contents of the application).

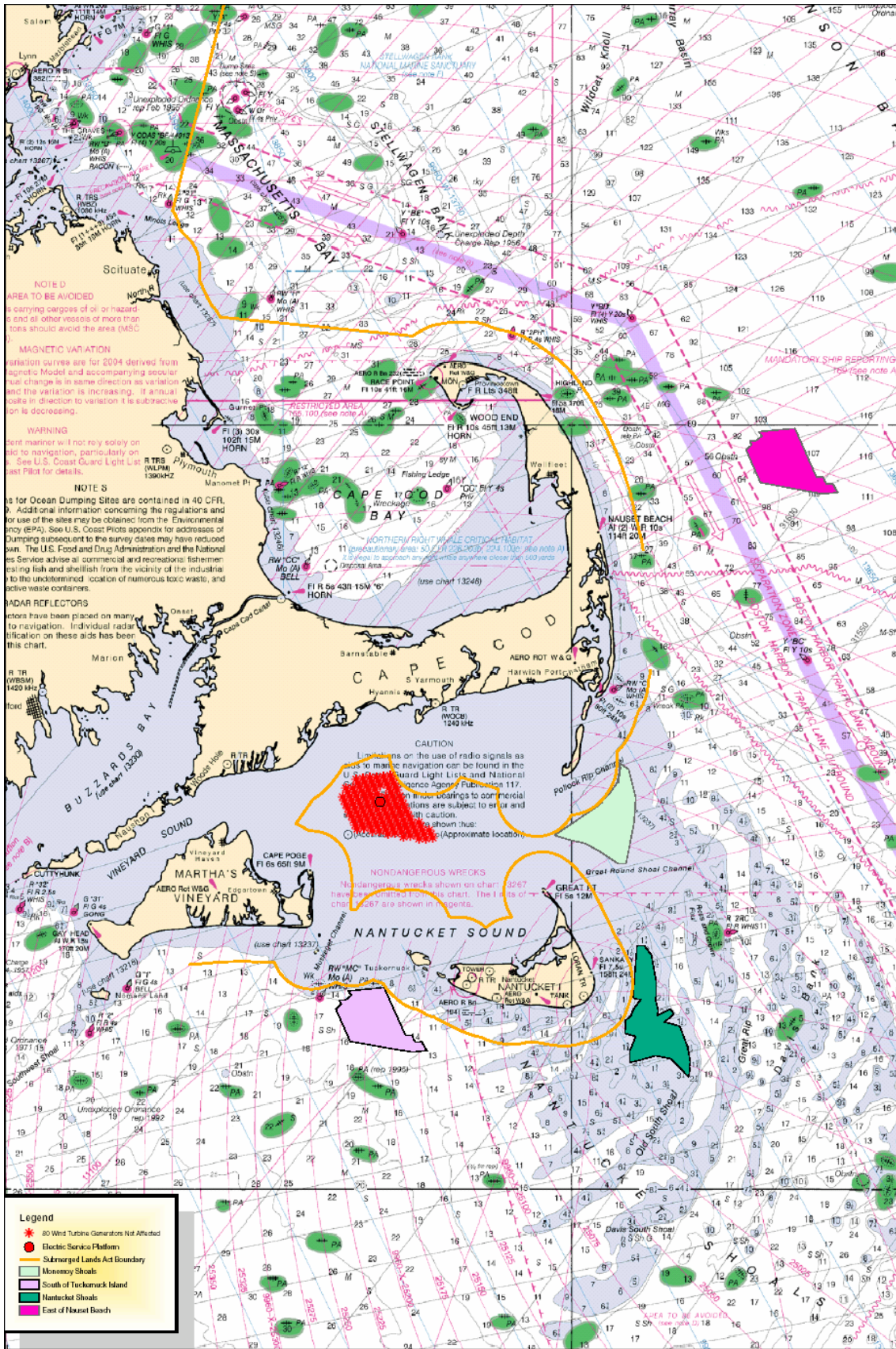






The proposed location of Cape Wind's 130 turbine wind farm in Nantucket Sound. A turbine would be located at each cross point on the grid visible inside the central polygon. A more detailed map of the grid can be seen in the next page.

It would be located in the middle of Nantucket Sound, in Horseshoe Shoal, where the water is less than 50 feet deep. Average depth of the shoal is approximately thirteen feet, a shallow depth, making the driving of the steel piles which serve as the base of a measurement tower easier than it would be in deeper water. Nantucket Sound is known worldwide for its wildlife and natural beauty. It is located near a busy shipping lane. This shoal [ “a shallow place in a lake, river, or sea”, Webster's ] has been chosen because it provides high winds, relative ease of construction, and protection from the ravages of oceanic waves (Stephen Koff). “The northernmost towers will be approximately 3.8 miles from the recently mapped dry rock feature (offshore near Bishop and Clerks) and approximately 5.2 miles from Point Gammon on the mainland; the southeastern portion of the Wind Park will be approximately 11 miles from Nantucket Island (Great Point), and the westernmost WTGs will be approximately 5.5 miles from the island of Martha’s Vineyard (Cape Poge).” (MMS Leasehold Application: project overview)

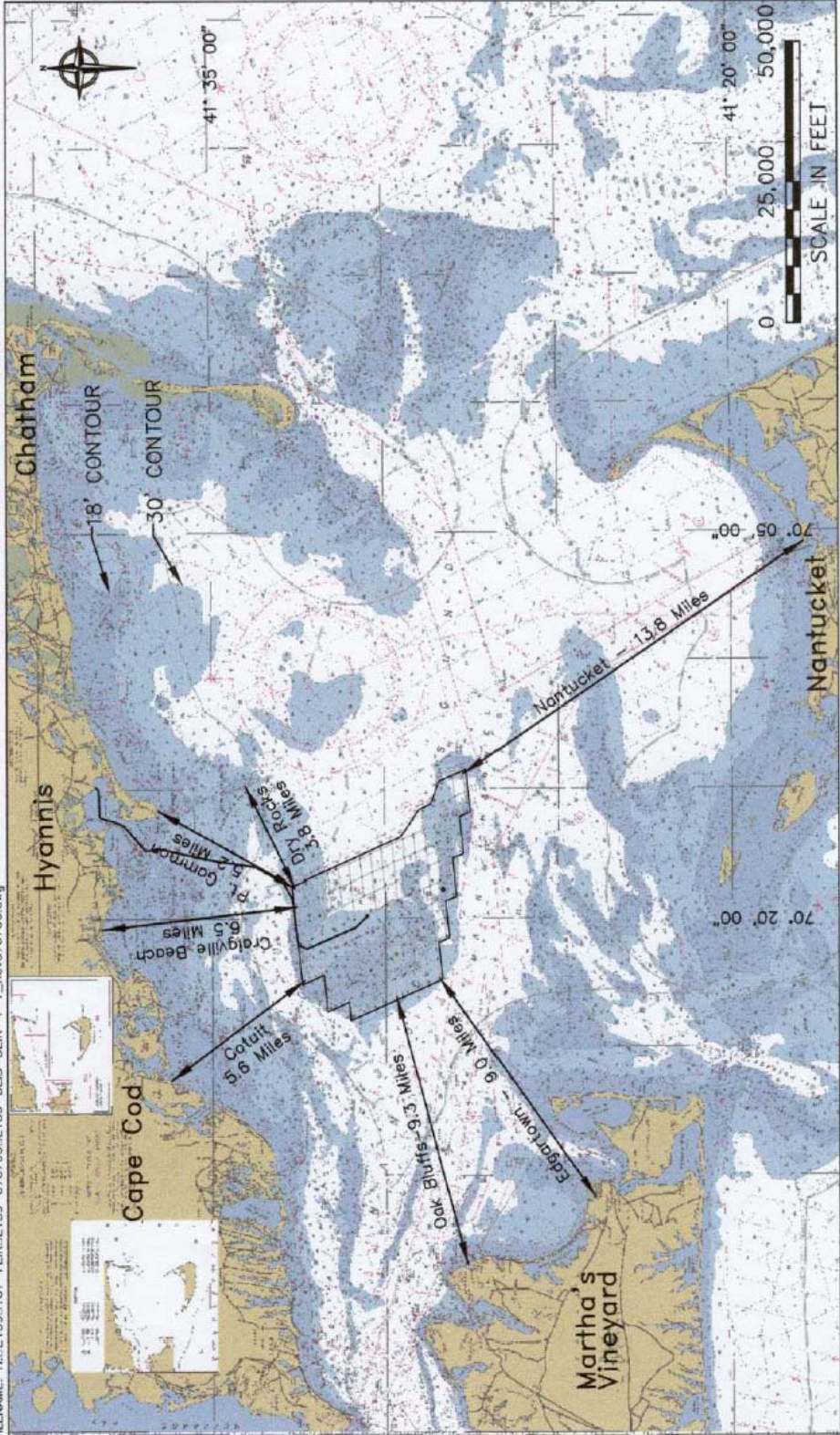


**Legend**

- 80 Wind Turbine Generators Not Affected
- Electric Service Platform
- Submerged Lands Act Boundary
- Monomoy Shoals
- South of Tuckermack Island
- Nantucket Shoals
- East of Nantucket Shoals



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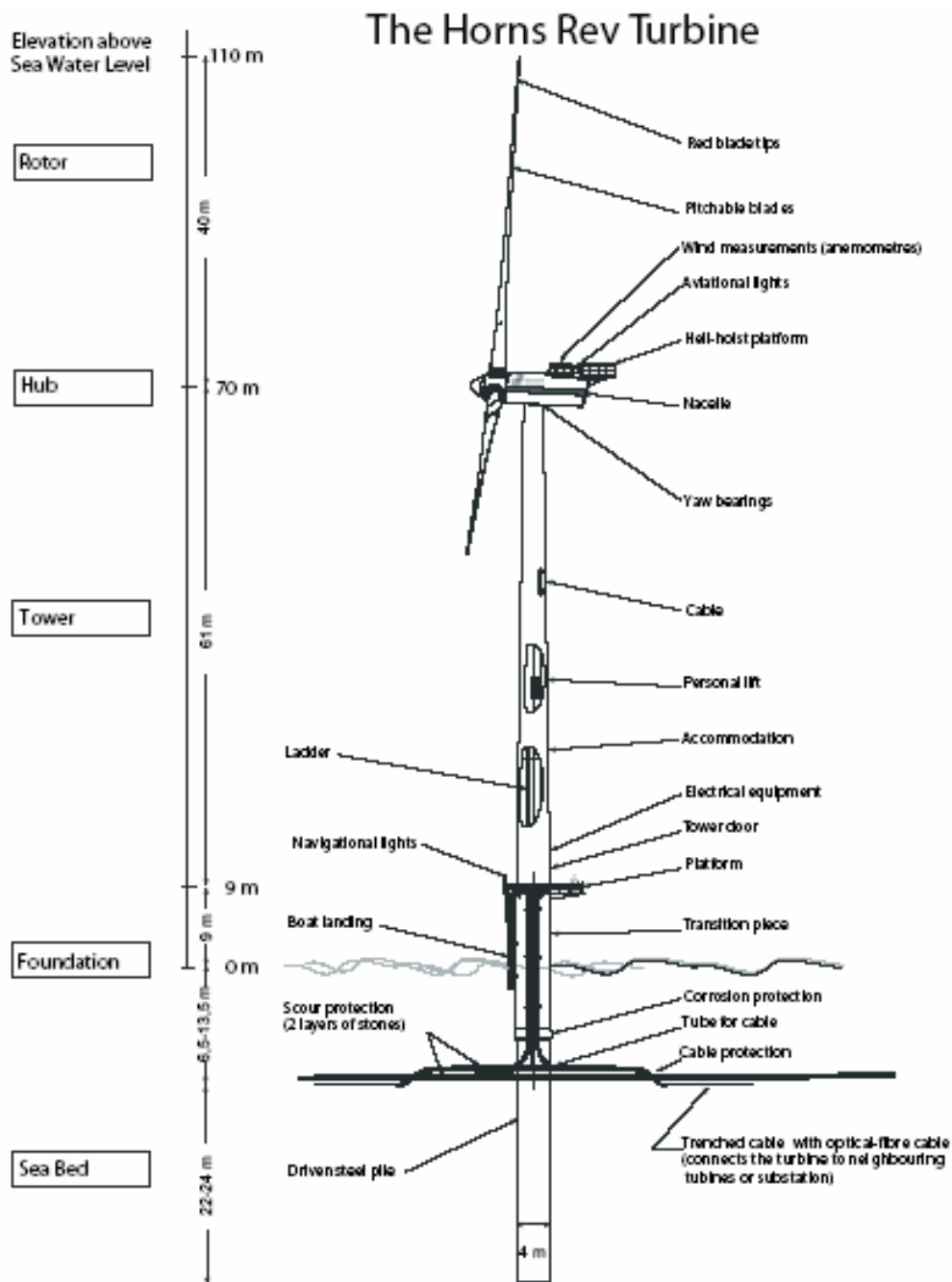
Cape Wind Associates, LLC.  
Cape Wind Project

NOAA Chart# 13237, Nantucket Sound & Approaches  
Cape Wind Project Locus

The purpose of the project is to provide a utility-scale wind energy facility providing power to the New England power grid. GE Wind Energy has agreed to construct the 3.6 MW turbines for the project, the construction and operations of which would require a lease, easement or right-of-way since it would be in part located in Federal waters. These turbines produce more electricity than the 2.7 MW originally expected and the current average of 1.5 MW (Jack Coleman). The rotor blades are made of fiberglass mats impregnated with polyester or epoxy. The towers are made of steel plate rolled into a conical subsection. “Towers are assembled from these small, conical subsections which are then cut and rolled into the right shape, and then welded together. Towers are usually manufactured in 65 to 100 ft. sections, transportation to the site being the limiting factor. Tower welds are inspected using ultrasound x-ray devices” (Cape Wind Associates, LLC). The nacelles, including the gearbox and generator are cut from special steel. The towers are installed on monopole foundations (each foundation will be between 250 and 350 tons, driven approximately 85 feet into the seabed.) The steel towers and nacelles will be mounted on welded steel monopole foundations that will utilize two different diameter foundation types depending on water depth. Water depths between 0-40 feet will utilize a 16.75 foot diameter monopile and water depths between 40-50 feet will utilize a 18.0 foot diameter monopile.



Swedish NEG Micon turbines (courtesy of Cape Wind Associates LLC)

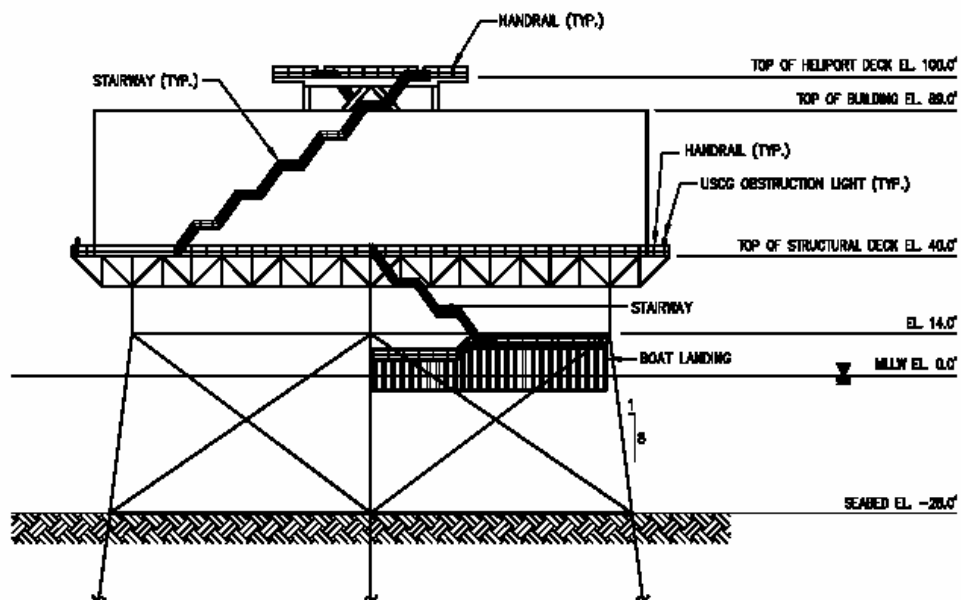


Principal Components and Dimensions of an Offshore Wind Turbine  
 Graphic courtesy of Horns Rev wind project, Denmark (<http://www.hornsrev.dk>). Copyright Elsam A/S.

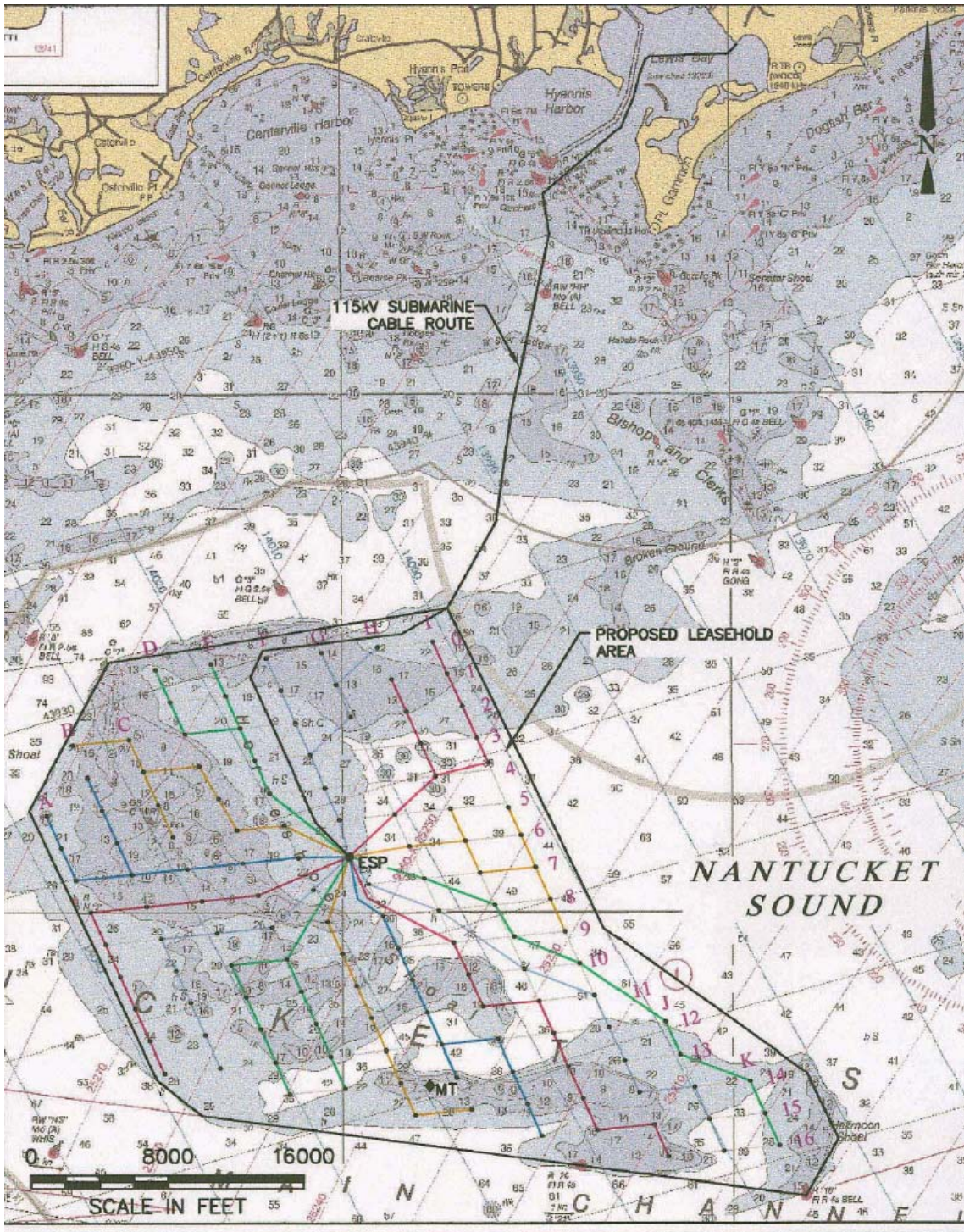
The wind-generated electricity from each of the turbines would be transmitted via a 33 kilovolt submarine transmission cable system to the Electric Service Platform [see figure below] located in the approximate center of the array as a common interconnection point of all the cables coming from each of the towers [see map below].



This offshore electric cabling will be buried several feet under the ocean floor (“hydroplowing”). The Electric Service Platform, that will consist of a steel superstructure of approximately 100 feet by 200 feet, and that will be placed approximately 39 feet above the mean lower low water level, will transform and transmit electric power to the Cape Cod mainland (12.5 miles in length, 7.6 miles within the Massachusetts 3-mile territorial line; the rest in federal waters) via two 115 kilovolt lines, where it will ultimately connect with the existing power grid. The submarine transmission lines would travel north to northeast in Nantucket Sound into Lewis Bay and then make landfall at New Hampshire Avenue in Yarmouth. The submarine transmission lines would transition to the underground upland transmission line to a transition vault situated at the end of New Hampshire Avenue. The underground line continues through several streets to the proposed intersection point with the existing NSTAR Electric 115 kV transmission line right of way (approximately 4.0 miles) which it will use (for 1.9 additional miles) until it reaches the Barnstable Switching Station where it will connect to the New England grid [see map below]. This upland transmission line would be located entirely within existing public roadways.



Electric Service Platform (source: ESS MMS Leasehold Project Application)



Cape Wind Associates, LLC.  
Cape Wind Project

Proposed Leasehold







Certainly the proximity of the project to the land reduces the amount of expensive underwater cable that must be laid between the farm and the mainland transmission facilities (John Leaning). Currently 45% of the Cape region's electricity comes from the nearby Canal Power Plant in Sandwich, which burns bunker oil and natural gas, and which is subject to repermitting processes since 1994 by the Massachusetts Department of Environmental protection and the U.S. Environmental Protection Agency because of the environmental problems of its water discharges.



The Mirant Canal Power Plant (courtesy of EPA)

## **II.- Proponents and their supporters.**

Cape Wind Associates LLC, a joint venture of Energy Management Inc. and Wind Management, LLC, decided to combine their financial and technology resources to promote and develop the first offshore wind energy project in Massachusetts and the United States. It claims proven corporate capability and success in power plant generation and wind turbine energy generation. It also claim commitment to responsible development of clean and renewable energy resources, as their logo shows.



Energy Management Inc. (EMI) is the developer of Cape Wind. "It is a Massachusetts based energy company with a 30-year history of engineering, developing and constructing energy conservation projects and, under its own statement, environmentally friendly electric generation facilities. The company introduces itself as having a proven track record in lowering energy costs, reducing pollution emissions, increasing energy independence, and creating jobs." (Cape Wind Associates, LLC). In 1975, EMI began developing energy conservation and pollution control projects for institutional and industrial facilities. In 1985, the company transitioned to developing independent power projects. The company has successfully developed six natural gas fired electric generation projects. Over the past twenty-eight years EMI earned a reputation of completing environmentally superior facilities with ultra-high plant availability. In 1999, EMI began to focus on developing renewable energy projects, specifically wind power projects.

Its President, Jim Gordon, is a developer who made a fortune building clean-burning natural gas power plants. His credentials (Cape Wind web pages) show that in 1975, Jim started EMI and over the ensuing years he would build EMI into one of the most successful privately held independent power companies in America. He recruited and managed a team of dedicated and highly motivated professionals that were able to complete the myriad and complex tasks of creating state of the art power projects. Jim's sense of timing and grasp of political and regulatory directions allowed EMI to develop some of New England's first gas fired cogeneration and independent power projects as well as the first generation of merchant electric plants in the United States.



Cape Wind premises in downtown Boston (A. Recarte & E. Alonso)

Engineers, Scientists, Consultants Group, Inc (ESS Group, Inc.) is the lead environmental engineer and consultant chosen by Cape Wind Associates, LLC.  
[ See cape wind associates link in Wikipedia "Cape Wind" ]



As the Cape Wind web site states, summarizing its philosophy, "although important, conservation by itself is not sufficient. Projects like Cape Wind will help meet this growing demand without consuming scarce natural resources or polluting our environment". "Wind mills are an icon on the Cape and islands," Jim Gordon says. "So, what we're doing is kind of going back to the future and addressing the present day problems that we have now, such as global warming and climate change, by building a clean, green, renewable energy project." (CBS Sunday Morning, June 29, 2003).

The credibility of these claims *per se* is part of the campaign of the Alliance since the same developer seems to be trying to build a diesel plant in Chelsea, just north of Boston (Audra Parker, My View-Diesel Plant...). For the Alliance "what the Chelsea proposal reveals is that Cape Wind's `green` is not an environmental shade, but the color of money", which adds to one of the most debated issues of the project: the federal subsidies. "Whether you call this company Cape Wind or EMI, this developer is about nothing more than pure profit. We should look at [Jim] Gordon's environmental promises with scepticism, especially when we [the public] are largely paying for these premises".



## WHY IS THIS MAN SMILING?

When Congress prepared to pass the Energy Policy Act of 2005 last summer, Cape Wind's friends in Congress slipped in a special-interest amendment that gives this wealthy energy developer a deal that most developers can only dream about: a no-bid, non-competitive deal for development rights on 24 square miles of Nantucket Sound for the largest industrial, offshore wind energy complex in the world.

Imagine being handed over 15,000 acres of ocean just off the coast of Cape Cod and the islands of Martha's Vineyard and Nantucket. No standing in line. No messy competition to spoil your chances. One developer, and the deal of a lifetime.



**YOU'D SMILE TOO IF**  
you had grabbed the sweetheart deal that Jim Gordon and Cape Wind got from Congress last year.

### But wait, this deal gets better.

Cape Wind also qualifies for over \$300 million in federal Production Tax Credits. That's \$30 million a year for 10 years. And they would also qualify for an estimated \$50 million a year in Massachusetts green credits for the lifetime of the project. That's another \$1 billion over a projected 20-year project life. They even get extra tax benefits by being able to depreciate this billion dollar project over just 5 years instead of the usual 20.

What do taxpayers get after handing over 24 square miles of public trust ocean lands to this developer? We get an industrial-scale project that will displace our commercial fishery, endanger boats and airplanes, harm the environment and risk a regional economy that relies on the beauty of Nantucket Sound.

Join with the many elected officials, fishermen, ferry operators, airports, chambers of commerce, taxpayers, and organizations who oppose destroying a national treasure for the corporate exploitation of one developer.

**SAVE OUR SOUND**  
An alliance to protect nantucket sound  
[www.saveoursound.org](http://www.saveoursound.org)

**Protect Public Safety, not Private Exploitation of Public Lands.  
Support the Coast Guard and Maritime Transportation Act of 2006.**



But Cape Wind is not alone. As the Sections on Scholars' Debate and on Guiding Students' Discussion will analyze more carefully, many environmental NGOs back the project. In Massachusetts, the Conservation Law Foundation (on this important New England non-profit see the Case Study "The Boston Harbor Project", of this Friends of Thoreau Program of the Institute of North American Studies, University of Alcalá), and nationally Greenpeace, are outspoken backers. In 2005 it sent its 163-foot Arctic Sunrise, a Greenpeace research boat, to the Hyannis area to back the project with a campaign that included the shuttling of visitors to the ship. Weeks before, some Greenpeace boats had been sent to protest against an event of the Alliance. A Cape-based group, Clean Power Now, supports the wind farm too. John Passacantando executive director of Greenpeace USA, says that climate change is the real issue: "See them [ the towers ] as a thumbnail in the horizon; see them as a sign of hope. If the project meets all environmental standards and it is defeated by the political process (led by rich people) the signal will be one of no reliability in the market. The renewable energy industry will be driven out" (WBUR debate).

It also has its local supporters: "I think this wind farm has really made some people decide to what degree they're committed to environmental change," says Rev. William Eddy, an Episcopal Priest who lived there for 30 years. "The wind farm promises to be a visible symbol of the way we're going to preserve the cape for the long term. I mean, we're going to have to face the facts. We already are facing the facts of the consequence of global warming. We're already losing our shoreline here." (CBS). Many working families think the same since the project promises at least 1,000 temporary jobs, in manufacturing assembly and ocean construction, and 150 permanent jobs thereafter, including 50 highly paid maintenance and operations jobs, all of them based on Cape Cod.

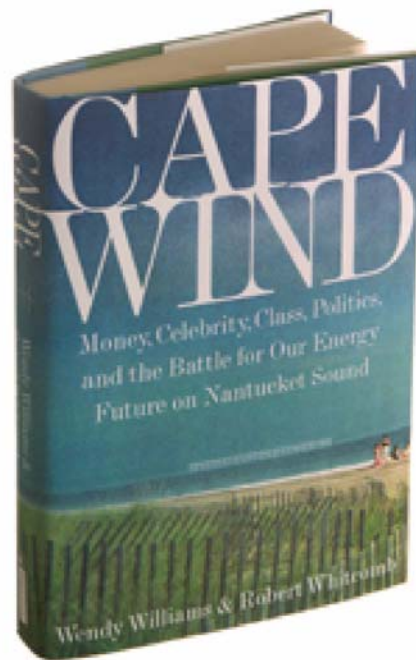


From Cape Wind paper brochure, Courtesy of Cape Wind Associates, LLC.

Other actors back the project as total outsiders sensitized by its general implications. A example is Bill McKibben, Middlebury College professor who lives in the Adirondacks. Author of "Wandering Home: A Long Walk Across America's Most Hopeful Landscape: Vermont's Champlain Valley and New York's Adirondacks", and acclaimed author of "The End of Nature", describes his own experience with wind parks in the Adirondacks as a psychological process that makes nature admirers first react against them but that ends up inevitably raising the unavoidable question: are wind parks really an "industrial

intrusion in the wilds or in rural space?” Climate change is for him much more intrusive. Any alternative to fossil fuels as source of energy needs the benefit of the doubt. “Wind energy generators are `symbols to take responsibility” (WBUR debate.)

Other writers are of the same opinion. Wendy Williams, who in the summer of 2006 was writing a book on the debate [ later to become, with co-author Robert Whitcomb, *Cape Wind: Money, Celebrity, Class, Politics, and the Battle for Our Energy Future on Nantucket Sound* ] was then clearly pro wind park. “Birds are not affected. The Sierra Club, Greenpeace are backing it”. She doesn’t like the debate to be distorted. She would prefer to hear things clear from “the rich”, such as: being environmentally friendly is OK, but I don’t want them in my yacht sailing area. (WBUR debate).



A different question is the position of the several government agencies involved in the permitting process. The Alliance has accused the Army Corps of Engineers and the Environmental Protection Agency of being biased on their environmental impact statement. It is true that the fact that this wind park might become the first offshore park, when many more are envisioned in both the east and west coasts, is a distortion factor: some government agencies think that if the project is finally rejected, the industry will receive a very negative signal; others think that the location is the only problem and that rejecting Cape Wind does not decrease the potential of having other offshore wind parks in the East Coast. This is also the position of State Senator Rob O’Leary, who represents the Cape Cod region. He points to a 200-foot weather tower that Gordon built in the middle of the proposed wind farm. It’s half as tall as the wind turbines. O’Leary says he support wind power “in principle, just not “at that location” (CBS Sunday Morning).

The recent developments in energy policy at the Federal level (the Bush Cheney National Energy Plan, the failed 2004 Energy Bill, and finally the Energy Policy Act of 2005) do have direct impact on the solution since they all pushed for the facilitation of

the siting of renewable energy production and distribution facilities, and in general of all sorts of energy related facilities energy, and for offshore wind energy in particular. The section on Scholars' Debate will help focus the debate.

What is already on the table is that the coast of the U.S. has been surveyed for its potential (see below, item 2 of the Section on Scholars' Debate), and that, in the East Coast, another project in New York (LIPA: Long Island Power Authority) is being already submitted, as Cape Wind, to MMS permitting (see item IV below, on Process). There are news about at least one other additional project in Massachusetts (not far from to Cape Wind, only 20 miles west, in Buzzards Bay; according to the Boston Globe, May 24, 2006, some opponents of the Cape Wind project have expressed interest in this plan); and States, such as, North Carolina, have put in place the regulatory framework to speed permitting (see Offshore Wind Farm Approval Process, North Carolina). (See Russell.)

### **III.- The Alliance and other opponents of the project.**

The Alliance includes different groups: 1) fishermen (commercial & sport); 2) Chambers of Commerce; 3) Traffic community (ferries); 4) Local airports (Hyannis & the Islands: Nantucket and Martha's Vineyard); 5) Local elected officials (in August 12<sup>th</sup> 2006, at least, the Governor of the Commonwealth of Massachusetts and other state senators); 6) Local environmental groups (see the list that follows at the end of this subsection, as it appears in the web pages of the Alliance).



Powerful members of Congress and Massachusetts Governor Mitt Romney dislike the Cape Wind project. Under Massachusetts' new governor, Democrat Deval Patrick, Cape Wind all indications suggest that the project will be approved by the Commonwealth. Representative Don Young (R-Alaska) championed a proposal as part of consideration on a Coast Guard reauthorization bill that would have banned any offshore wind project that is sited within 1.5 miles of a shipping channel, effectively killing the project.



Young suggested that Cape Wind could pose a hazard to navigation (Wikipedia, Cape Wind).

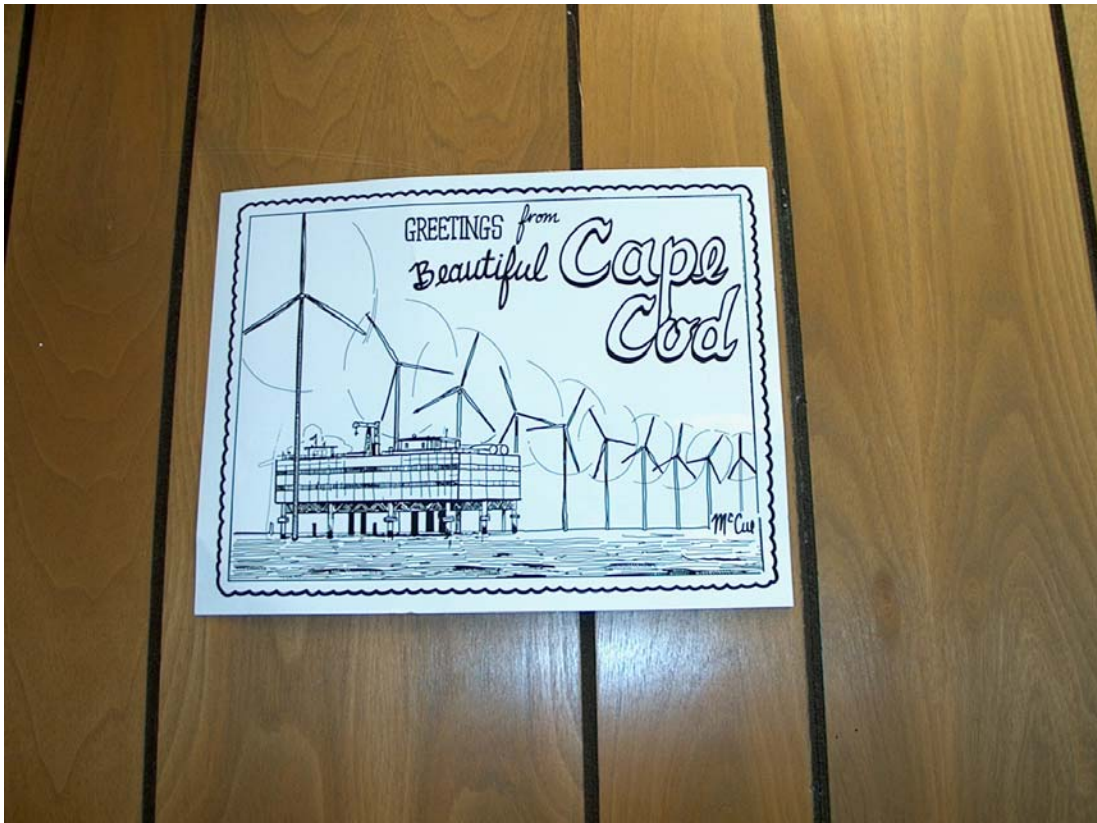
The politics of it all reached a peak in December 16, 2005, when Robert Kennedy Jr. wrote an essay, published in the New York Times, stating his support for wind power in general, but opposing this project (his family's world famous Compound is within sight of the proposed wind farm) [ see Section on Guiding Students' Discussion ].

The stakes have eventually ran high, like in September 25, 2005, when "Greenpeace was `greenpeaced'". A flotilla of 20 vessels, which included fishing trawlers and high-priced Whalers, circled the Greenpeace boat Arctic Sunrise off Kalmus Park Beach in Hyannis, demonstrating in protest of Greenpeace's support of the proposed wind farm. Cliff Carroll, whose group Windstop.org staged the protest along with the Massachusetts Fishermen's Council, said that "Greenpeace has ignored some of the environmental concerns about the wind farm"(Kevin Dennehy, Cape Cod Times.)



The license plates system of Massachusetts allows the sponsoring of the Public Trust of the Commonwealth.

The basic point that the Alliance want to make is that "Nantucket Sound is a public resource known worldwide for its unique wildlife and natural beauty. Many citizens, our state leadership, and local and national groups realize that this project is an inappropriate use of such a treasured public resource." (Save Our Sound, web page of the Alliance, Overview). The Alliance has an articulate response for each and every aspect of the project (energy supply, economics, easthetics, environmental justice...) most of which are carefully analyzed in the Sections on Scholars' Debate and Guiding Students' Discussion.



From a more general perspective other institutions are also backing, for coincidental but different reasons based on general principles that should govern energy policy and on the economics of the project, the opposition to Cape Wind. The Cato Institute and the Beacon Hill Institute at Suffolk University, for example, are trying to make sound economics to respond to the economic benefits envisioned by the project, focusing on the level of subsidies. [ See item 5 of the Section on Scholars' Debate ]

Some of the many groups and individuals voicing concerns over the wind power plant proposal [ list taken from Save our sound, January 2007 ]:

### **Political Leaders**

- Governor Mitt Romney
- Attorney General Thomas Reilly
- Senator Edward M. Kennedy
- Senator Robert O'Leary
- Congressman William Delahunt
- State Representative Demetrius Atsalis
- State Representative Shirley Gomes
- State Representative Jeffrey Perry
- State Representative Eric Turkington
- State Representative Cleon Turner

## **Towns, Tourism & Business Organizations**

- Town of Barnstable
- Town of Chilmark
- Town of Edgartown
- Town of Mashpee
- Town of Nantucket
- Town of Yarmouth
- Barnstable County Assembly of Delegates
- Cape Cod Chamber of Commerce
- Falmouth Chamber of Commerce
- Hyannis Area Chamber of Commerce
- Martha's Vineyard Chamber of Commerce
- Nantucket Chamber of Commerce
- Chatham Chamber of Commerce
- Harwich Chamber of Commerce
- Nantucket Online
- Yarmouth Area Chamber of Commerce

## **Environmental & Wildlife Preservation**

(Visit <http://www.safewind.info/> to learn more)

- Barnstable Land Trust
- Humane Society of the United States
- International Wildlife Coalition
- Massachusetts Society for the Prevention of Cruelty to Animals
- Pegasus Foundation
- Three Bays Preservation
- Wampanoag Tribal Council
- Save Popponessett Bay

## **Commercial Fishing Groups**

- Massachusetts Fishermen's Partnership, representing
  - Boston Harbor Lobstermen's Cooperative
  - Commercial Anglers Association
  - General Category Tuna Association
  - Gloucester Fishermen's Association
  - Gloucester Fishermen's Wives Association
  - Gulf of Maine Fishermen's Alliance
  - Marshfield Commercial Fishermen's Association
  - Massachusetts Inshore Ground Fishermen's Association
  - Northeast Seafood Coalition
  - New Bedford Seafood Coalition
  - New England Fish Exchange
  - Pigeon Cove Fishermen's Cooperative
  - Plymouth Lobstermen's Association
  - South Shore Lobstermen's Association



- Massachusetts Lobstermen's Association
- Cape Cod Commercial Hook Fishermen's Association
- Massachusetts Commercial Fishermen's Association
- Massachusetts Marine Trades Association
- Cape Cod Marine Trades Association
- Edgartown Charter Fishing Association
- Edgartown Shellfish Organization

### **Recreational Fishing & Boating Groups**

- Mass. Boating and Yacht Clubs Association (80 member clubs)
- Recreational Fishing Alliance (80,000 members)
- Coastal Conservation Association, MA chapter
- Crosby Yacht Yards
- Hyannis Anglers Club
- Hyannis Marina
- Oyster Harbor Marine
- Bass River Rod & Gun Club
- Falmouth Rod & Gun Club
- Osterville Anglers Club

### **Boating Safety and Navigation**

- Cape & Islands Harbormasters Association
- Hy-Line Cruises
- Steamship Authority

### **Air Safety**

- Barnstable Municipal Airport Commission
- Island Airlines
- Nantucket Airport Commission
- Martha's Vineyard Airport
- Marstons Mills Airport
- National Air traffic Controller's Union, Cape TRACON

### **Real Estate**

- Cape Cod & Islands Association of Realtors

## **Civic & Recreation**

- Bass River Yacht Club
- CBA/Christian Camp Meeting Association Beach
- Hyannis Civic Association
- Hyannis Yacht Club
- Osterville Village Association
- Cotuit Civic Association
- Waquoit Bay Yacht Club
- Wianno Club

## **Towns Calling for a Programmatic (Comprehensive) Environmental Analysis**

- Barnstable
- Chatham
- Yarmouth
- Mashpee
- Nantucket
- West Tisbury

## **Towns Asking the Army Corps of Engineers to complete an oil spill trajectory map**

- Barnstable
- Wellfleet
- Chatham
- Brewster
- Dennis
- Yarmouth
- Mashpee
- Falmouth
- Tisbury
- West Tisbury
- Chilmark
- Edgartown
- Nantucket

## **Groups Promoting Comprehensive Management of This or Other Local Offshore Wind Projects**

- Association to Preserve Cape Cod
- Sippewissett Association
- Nantucket Board of Selectmen
- Town of Chatham
- Town of Mashpee

- Town of Tisbury
- Martha's Vineyard Commission
- Vineyard Conservation Society

#### **IV.- The Process.**

Changes in federal law have influenced the process. Until the enactment of the 2005 Energy Policy Act

The permitting process for the Cape Wind project falls under Federal, State, regional and local jurisdiction.

In November, 2001, Cape Wind Associates filed an Environmental Notification Form with the Massachusetts Environmental Policy Administration Office and applied for a Section 10 permit under the Rivers and Harbors Act of 1899 with the New England District of the U.S. Army Corps of Engineers (Corps), the lead federal agency for review under the National Environmental Policy Act (NEPA) [ See item 6 of the Section in Guiding Students' Discussion ]. After a coordinated six-month scoping process that involved over a dozen federal, state, and regional agencies, in April, 2002, the Massachusetts Environmental Policy Administration (MEPA) Office issued the scope for the Environmental Impact Report (EIR) to be submitted and reviewed under MEPA. In June, 2002, the Army Corps issued its own scope, which incorporated the MEPA scope by reference, for the Environmental Impact Statement (EIS) to be submitted and reviewed under NEPA. The Army Corps eventually presented a draft Environmental Impact Statement (EIS).

During the scoping process, a dozen or more federal, state, and regional agencies--most of which will ultimately issue permits on the project--met on a weekly basis to discuss the contents of the scope (Interview with Arthur Pugsley, Environmental Analyst, MEPA Office, September 25, 2003, on file with author Jay Wickersham).

Federal agencies involved in the scoping included the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service. State and regional agencies included the Massachusetts Department of Environmental Protection, the Massachusetts Department of Environmental Management (now the Department of Conservation and Recreation), the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement, the Massachusetts Office of Coastal Zone Management, the Energy Facilities Siting Board, and the Cape Cod Commission (a regional body). The agencies took the collective position, reflected in the MEPA and Corps scopes, that a unified set of federal and state documents should examine the full range of project impacts, without regard for questions of territorial or subject matter jurisdiction. As further evidence of the level of state involvement, the MEPA Office issued the initial scope for the state-level Environmental Impact Report (EIR) in April 2002. The Corps then incorporated the MEPA scope by reference as the basis for the federal Environmental Impact Statement (EIS) as well, while requiring certain elements to be added to the document.



Nevertheless, the assessment was, first, questioned from the point of view that even if there is a process of informed decision-making at work, the right decision perhaps cannot be made because of the lacking of integrated decision-making regulated process. Do NEPA or MEPA require the development of an overarching federal or state policy for offshore wind development, or of a framework for the comprehensive planning and zoning of ocean resources, before agencies make individual decisions on the Cape Wind project? (Jay Wickersham). The 2005 Energy Policy Act can be understood as a clear attempt to achieve integrated holistic decision-making processes on offshore windparks permitting as it will be later described.

But, what is more important, the Army Corps of Engineers took much criticism for its role in this proposed project which it may have favored because it would be the first offshore wind energy plant in the United States. In a public comment period, many Federal agencies, local governments, and community groups found the draft EIS of the Army Corps of Engineers to have many deficiencies. In particular, some commentators [such as Utzinger, Kempton, or Baur & MacLean ] fuelled opposition to the Cape Wind project by arguing forcefully that the federal regulatory regime in place until recently failed to protect public interests threatened by the development of offshore wind energy facilities (Eberhardt). “The Corps' review process for proposed activities on the outer continental shelf is deficient because “[i]t cannot grant leases or exclusive rights to use or occupy space on the outer continental shelf. It is not based on a comprehensive and coordinated planning process for determining when, where, and how this activity should take place. It also lacks the ability to assess reasonable resource rent for the public space occupied or a fee or royalty for the energy generated.” (U.S. Commission on Ocean Policy.)

Of course, as every conflict of interest in the U.S., the debate reached the courts even at these preliminary stages: “when the Corps of Engineers awarded Cape Wind the necessary permit to construct a scientific measuring devise station 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 measuring station and not to the proposed wind farm itself, the cases implicated all three of the following environmental regulation issues: 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. Judge Tauro of the United States District Court for the District of Massachusetts dismissed two suits, suggesting answers to some of these debated issues.” (Hartland).

The two lawsuits, which very probably will not be the only ones, since John Spillane, a lawyer representing the boaters and property owners, has announced they will file suit in Barnstable Superior Court if Ian Bowles, the Commonwealth’s Secretary of Energy and Environmental Affairs, approves the environmental impact report, saying the project complies with State environmental laws, were *Ten Taxpayers Citizen Group v. Cape Wind Associates, L.L.C.*, No. 02-CV-12046-JLT (D. Mass., Aug. 19, 2003) (granting Cape Wind's motion to dismiss) and *Alliance to Protect Nantucket Sound v. United States Department of the Army*, No. 02-11749-JLT (D. Mass., Sept. 18, 2003) (granting summary judgment motions filed by the Army Corps of Engineers and Cape Wind).

In the first one, although Judge Tauro acknowledged that the Federal government, through the amended Magnuson-Stevens Fishery Conservation and Management Act, had delegated authority to the Commonwealth to determine "who may fish, by what means they may fish, and how much they may fish" in Nantucket Sound, he denied that anything in the statute "supports the proposition that regulating non-fishing activities simply for the protection of fish falls under the Commonwealth's jurisdiction."

In the second one, the Alliance alleged that: 1) "the Corps lacked the authority to issue a Section 10 [ of the Rivers and Harbors Act of 1899 ] permit for activities on the 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." Judge Tauro rejected both of these claims, adopting the reasoning of an amicus curiae brief filed by the Conservation Law Foundation. Its amicus brief argued that federal law authorizes the Corps of Engineers 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 and Section 4(f) of the Outer Continental Shelf Lands Act, the Corps has the authority to review the environmental impact of all improvements on the continental shelf regardless of purpose (Hartland).



Because of passage of the 2005 Energy Bill in August 8, 2005, the regulatory authority for offshore energy projects was transferred from the Army Corps to the Department of Interior's Mineral Management Service (MMS), which manages the U.S. natural gas, oil and other mineral resources on the outer continental shelf.



Whereas Cape Wind had expected to obtain approval quickly from the Army Corps, this transfer of authority to the MMS seems to have delayed the project. In Section 388 of

the Energy Policy Act of 2005 (43 U.S.C. § 1337), as Eberhardt has summarized, Congress addressed many of the concerns about the federal regulatory regime by (among other things): (1) authorizing the Secretary of the Interior to grant leases, easements, and rights-of-way on the outer continental shelf on a competitive basis for activities that produce or support production, transportation, or transmission of energy; (2) requiring the collection of payments and revenue-sharing with coastal states for the energy-related uses of the outer continental shelf; (3) requiring grantees to furnish surety bonds or other security to protect the interests of the public and United States; and (4) requiring that the Secretary of the Interior ensure that authorized energy-related activities are carried out in a manner that meets a number of substantive requirements. Section 388 also directs the Secretary of the Interior to issue regulations in consultation with other federal agencies and "the Governor of any affected State" to further define this new regulatory regime. The MMS later issued an Advance Notice of Proposed Rulemaking to begin the process (Alternative Energy-Related Uses on the Outer Continental Shelf, December 30, 2005, 30 C.F.R. 285).

In March 2007 the MMS issued a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS), request for written scoping comments and invitation for participation by cooperating (submission of comments was opened until July 14<sup>th</sup> 2007.) In addition to the MMS' analysis under NEPA, at the Federal level, the Massachusetts Environmental Policy Act (MEPA), at the State level, will apply to the project's upland and submarine cable system components in Nantucket Sound out to the 3-mile State/Federal boundary. In order to address all the environmental analyses in the most efficient manner, the State MEPA and Federal NEPA processes would run concurrently and be analyzed together, within the NEPA document. The Department of the Interior invited other Federal, State, tribal, and local governments to consider becoming cooperating agencies in the preparation of the EIS. The Notice of Intent already considered cooperating Agencies on the Cape Wind project EIS the following:

United States Fish and Wildlife Service.

Cape Cod Commission.

United States Department of Energy.

United States Coast Guard.

United States Department of the Interior/Office of Environmental Policy and Compliance.

Wampanoag Tribe of Gay Head.

Federal Aviation Administration.

Massachusetts Coastal Zone Management.

Massachusetts Environmental Policy Act Office.

National Oceans and Atmospheric Administration/National Marine Fisheries Service.

United States Environmental Protection Agency.

United States Army Corps of Engineers.



The fact that these public administrations are all cooperating agencies for the purpose of the EIS does not prevent the need of additional permits *per se*. The figure below includes the list of federal, state, regional & local agencies whose approval/permits/action are required for the project, as listed in the leasehold application to the MMS by Cape Wind associates.

<b>Agency</b>	<b>Approval/Permit/Action Item</b>	<b>Status</b>
United States Army Corps of Engineers (USACE)	Individual Permit – Section 10 Rivers and Harbors – File No. USACE NAE-2004-338-1(formerly 200102913)	Filed: 11/22/01 Approval: Pending
	USACE Draft Environmental Impact Statement	Filed: 11/2004 Approval: MMS is now the lead federal agency
United States Environmental Protection Agency	NPDES General Stormwater Permit	To be filed
	40 CFR Part 55 Air Permit for OCS Sources	To be filed
Federal Aviation Administration	Notice of Proposed Construction or Alteration Form (FAA Form 7460-1) – File No. 2002-ANE-982-OE through 1111-OE	Filed: 10/25/02 Approval: 04/09/03
US Coast Guard	Permit to Establish and Operate a Private Aid-to-Navigation to a Fixed Structure	To be filed
<b>STATE</b>		
Massachusetts Environmental Policy Act	Environmental Notification Form – EOE No. 12643	Filed: 11/15/01 Approval: 4/22/02
	Draft Environmental Impact Report	Filed: 11/15/04 Approval: 3/3/05
	Notice of Project Change	Filed: 6/30/05 Approval: 8/8/05
	Final Environmental Impact Report	To be filed
	Issuance of Certificate	Pending
Massachusetts Energy Facility Siting Board	Petition to Construct Jurisdictional Facilities Certificate of Environmental Impact and Public Need – File No. EFSB 02-2	Filed: 9/17/02 Approval: 5/10/05
	Approval under Section 72 under C.164 – File No. D.T.E. 02-53	Filed: 9/17/02 Approval: pending
Massachusetts Department of Environmental Protection – Wetlands and Waterways Regulation Program	Chapter 91 Waterways License	Filed: 12/13/04 Approval: pending
	MADEP Water Quality Certification	To be filed
	Superceding Order of Conditions	To be filed, if required
Massachusetts Coastal Zone Management	Concurrence with Federal Consistency Certification Statement	CZM Review is currently being coordinated
Massachusetts Highway Department	Permit to Access State Highway and Access Agreement	To be filed
Massachusetts Historical Commission: State Archaeologist	Permit for Upland Reconnaissance Archaeological Survey - Permit No. 2246	File: 3/12/03 Approval: 3/28/03
	Permit for Upland Intensive Archaeological Survey – Permit No. 2595	Filed: 9/18/03 Approval: 9/23/03
Massachusetts Board of Underwater Archaeology	Reconnaissance Permit; Excavation Permit	To be filed, if required
<b>REGIONAL</b>		
Cape Cod Commission	Development of Regional Impact Review – File No. JR#20084	Filed: 11/15/01 Approval: pending
	Issuance of DRI	Pending
<b>LOCAL</b>		
Yarmouth Conservation Commission	Notice of Intent	To be filed
	Issuance of Order of Conditions	
Barnstable Conservation Commission	Notice of Intent	To be filed
	Issuance of Order of Conditions	
Yarmouth Department of Public Works (DPW)	Street Opening Permit	To be filed
Barnstable DPW	Street Opening Permit	To be filed

These actions of the listed agencies are, of course, additional to those of the lead agency whose actions are the following:

Department of Interior - Minerals Management Service	Grant Lease, Easement, or Right-of-Way Under Sec. 8 of the Outer Continental Shelf (OCS) Lands Act	Filed: 9/14/05
	Project Plan (Supplement to 9/14/05 Grant Lease)	Filed: 7/11/06
	Environmental Management System	To be filed
	Oil Spill Response Plan	To be filed
	Structure Permit Applications	To be filed
	Decommissioning Permit Application	To be Submitted Prior to Decommissioning
	Cable Application	To be filed
	MMS Draft Environmental Impact Statement	To be filed
	Final Environmental Impact Statement	To be filed
	Record of Decision	Pending

State authority is exercised: (1) through control of submerged lands within three miles of the coastline; and (2) through federal consistency review under the Coastal Zone Management Act (CZMA).



Seal of the Commonwealth of Massachusetts

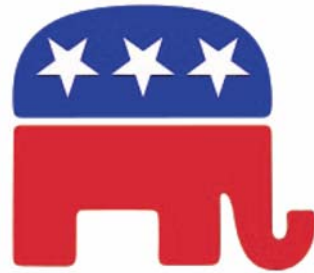
The first one gives States the control over the siting of offshore wind energy facilities (even those facilities with turbines proposed for the outer continental shelf, because, in any case, all facilities will require connection to the electricity grid through submarine cables running from the turbines to shore). Cape Wind Associates LLC has asked for the state Chapter 91 Waterways License, the State's primary tool for regulating private development on submerged lands. Apparently, to subject the project to the most rigorous state review possible, the Massachusetts Secretary of Environmental Affairs has taken the position that the proposed submarine cables represent "nonwater-dependent uses". The State issues licenses for "nonwater dependent uses" only if they meet a strict "overriding public interest" standard, an opinion which the new Secretary, Ian Bowles, will probably amend. Cape Wind Associates LLC vigorously objected to the State's Republican Party administration's position. Governor Mitt Romney proposed major changes in the way the State would manage submerged lands, and its proposal includes a policy on offshore wind energy (Eberhardt), which will probably also be changed under the new Democratic Party administration.

Although the scope of State control under the CZMA is less expansive than that pertaining to submerged lands, consistency review appears to give states significant opportunities to stop or delay the issuance of federal approvals needed for offshore wind energy projects, including Section 388 property interests. Federal consistency review requires federal agencies to act in manner consistent with "enforceable policies" contained in "coastal management programs" prepared by states and approved by the Secretary of Commerce. In other words, once a state's coastal management program has

been approved, federal agencies must comply -at least to a point- with the enforceable policies included in that coastal management program (Eberhardt).



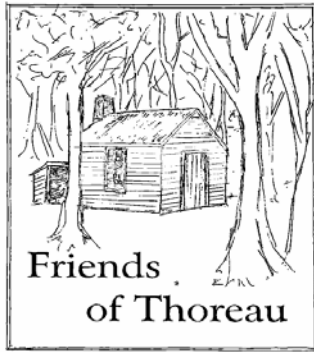
Former Governor Mitt Romney



Current Governor Deval Patrick







## Cape Cod Offshore Wind Park, the Multivariate Nature of Energy Policy Issues.

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### SCHOLARS' DEBATE

#### 1.- The context: the Bush-Cheney Plan; the 2005 Energy Policy Act and its implementation.

Renewable energy issues cannot be discussed in isolation. They are inextricably linked to national energy policy in terms of security, ensuring an adequate supply of energy to the Nation, and of the environment, responding to climate change.

The need to plan energy policy at the national level was not really a necessity until quite recently. It was the George W. Bush administration, at the wake of its first term at the White House, the one that raised energy issues to the forefront of national politics. The so-called Bush Cheney National Energy Plan (see *Reliable, Affordable, and Environmentally Sound Energy for America's Future*, Report of the National Energy Policy Development Group, May 2001, cited in the Section on Links to Online Resources), which, independently of other scholarly detailed analysis (such as Gary C. Bryner's), was criticized, from its very origin, as an attempt to ensure the profits of the oil & coal lobby, rather than as a serious commitment to solve America's energy future, did not seem to give any weight to climate change. Actually, one of the first decisions of the Bush Administration was to back-off from the U.S commitment to combat CO2 emissions under the Kyoto Protocol notwithstanding the National Academy of Sciences (NAS) findings, in a report responding to the President's request, in the sense that the

science behind the III report of the IPCC (International Panel on Climate Change) was utterly accurate notwithstanding minor flaws. The U.S official Federal policy has remained the same until very recently, when the U.S., Supreme Court mandated the Environmental Protection Agency to address the issue of CO<sub>2</sub> and other greenhouse gases as a pollutant (*Massachusetts et al vs. Environmental Protection Agency et al*, Case N° 05-1120, decided in April 2, 2007, see, for its full content the Section on Links to Online Resources).

What were the findings of the NAS? What has been the position of other States and cities' agencies concerning climate change policies? Analyse carefully the Bush-Cheney National Energy Plan (Chapters 3 & 8, see Section on Links to Online Resources). What was the position of the Plan concerning climate change?

The Plan also considered wind energy as part of the package on renewable energies (Chapter 6). What was its base point? Did it address questions related to offshore wind farms?

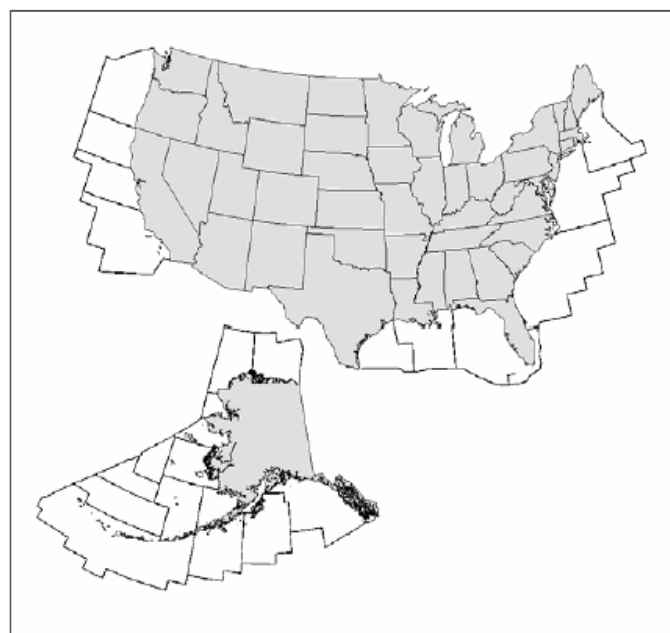
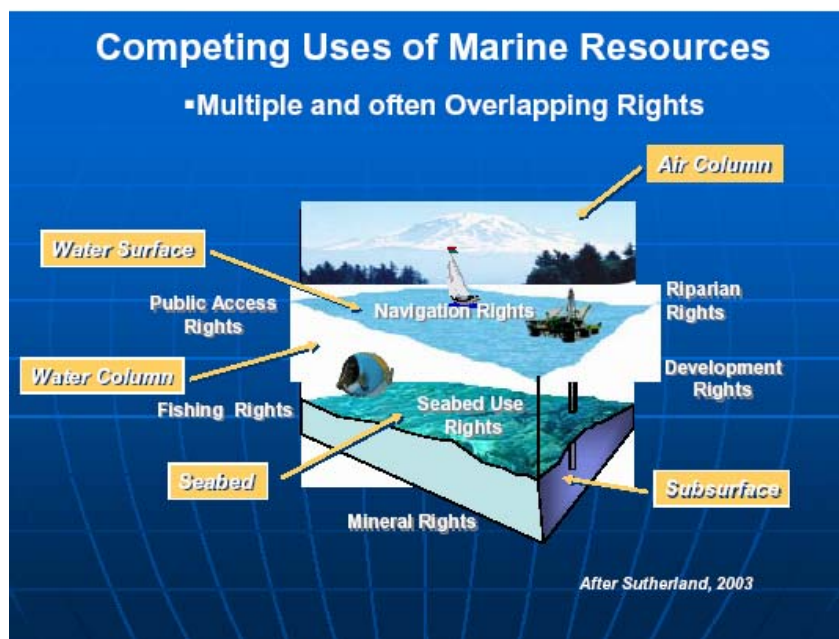
The implementation of the Federal policies embedded in the Plan took energy to the forefront of Congressional law-making. The first bill was killed at its very final stages because it reflected the worst example of lobby-based Washingtonian politics affecting the legislative process. The joint press conference of representatives of both the GOP and the Democratic Party expressed it very clearly: from the very first moment of introduction of the bill, both in the House and in the Senate, the legislators had focused exclusively on having the small petty advantages for their towns, States, or interest groups reflected in the Act, thus leading to a text which was an amalgam of inconsistencies and contradictions.

The second bill was taken much more seriously. The result, the National Energy Act of 2005 (43 USC § 133 et seq., see Main Page item IV), is as voluminous, or even more, as the previous failed bill, but it was much more serious in formulating, or at least attempting to, a national energy policy. [ See the Act in the Section on Links to Online Resources, and a summary in Energy Policy Act of 2005, Wikipedia, also cited in that Section.] The issue of offshore wind parks is addressed mainly in Section 388. Besides appointing the Mineral Management Service (MMS) as the Federal lead agency, what guidance does it offer on offshore wind energy?

## **2.- National or site-by-site planning?**

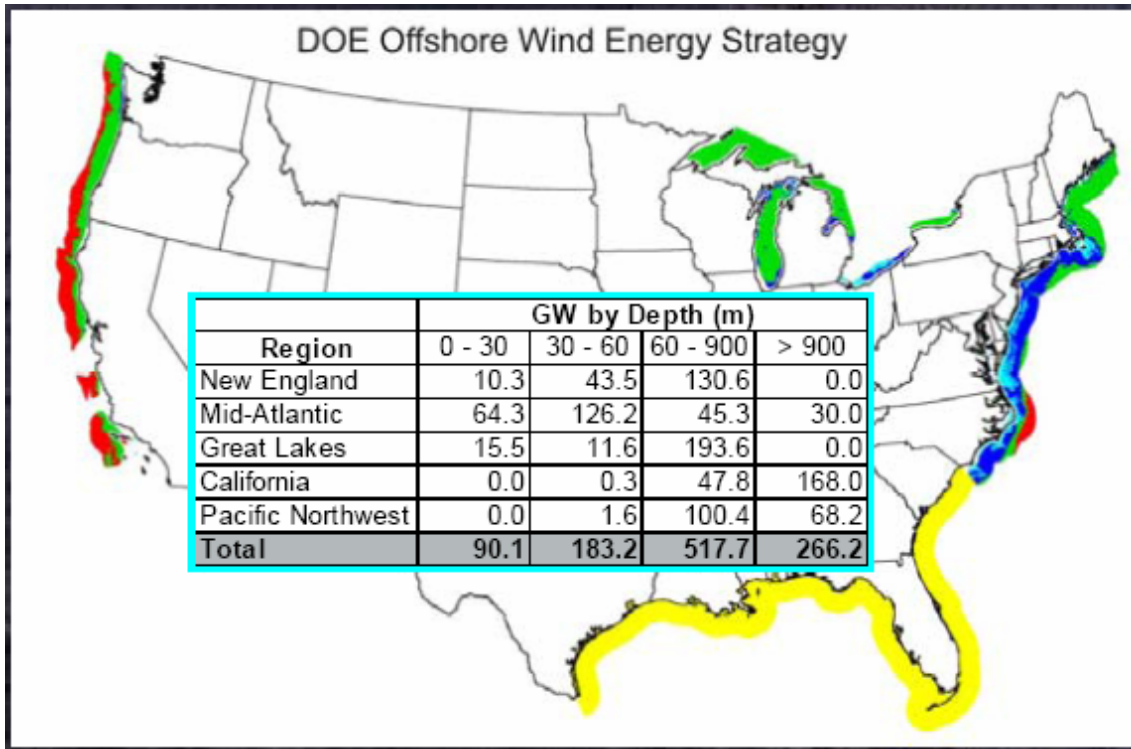
Territory is of essence in windpark sitting. The physics of the force, continuity and direction of wind condition the location of wind parks. In the sea, technology is also a major issue since seashore sighting might become a major inconvenience in some areas such as Cape Cod. MMS has started a process of identification of potential areas for offshore wind farming and other potential uses of the outer continental shelf (OCS) in both U.S. coasts, under the authority of Section 388 – *Alternative Energy-Related Uses on the Outer Continental Shelf*- of the Energy Policy Act of 2005. Moreover, it directs the Secretary of the Interior, in cooperation with the Secretary of Commerce, the Commandant of the Coast Guard, and the Secretary of Defense, to establish an OCS Mapping Initiative to assist in decision making related to alternative energy uses on the OCS. The goal of the initiative is the identification of OCS locations of Federally

permitted activities; obstructions to navigation; submerged cultural resources; undersea cables; offshore aquaculture projects; and any area designated for the purpose of safety, national security, environmental protection, or conservation and management of living marine resources. The repository of this data will be the **Multipurpose Marine Cadastre**, which will be an integrated submerged lands information system consisting of legal, e.g., property ownership or cadastre, physical, and cultural information in a common reference framework. This information system includes, where available, biological and habitat information necessary for Federal agencies to fulfill their legislative mandates. In response to this directive, MMS developed an following implementation plan entitled the “Implementation Plan for the Multipurpose Marine Cadastre” (See Section on Links to Online Resources), based on an evaluation of competing uses of marine resources (see figure below) based on coastal zones (see map below).

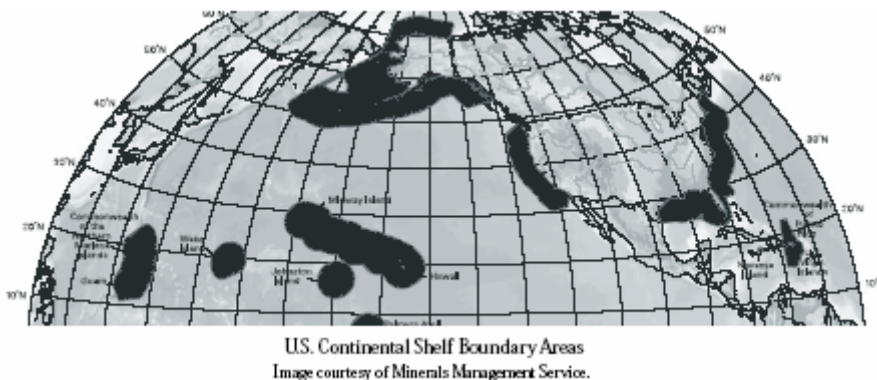




The National Renewable Energy Laboratory is identifying the best coastal zones for offshore wind parks (see also Firestone et al). Their map shows the following evaluation of U.S. offshore wind energy resources by depth:



Musial et al NREL [ In yellow, resources not yet assessed ]



Should this lead to a process of environmental impact assessment of the potential areas as a whole, instead of a piecemeal approach in which one by one all the proposed projects are assessed? Can alternatives be really evaluated if there is no comprehensive selection of the best places along the coast?

The following figure shows the list of windparks for which petitions for permits have been already advanced by various companies in Spain.

PARQUES EOLICOS OFFSHORE INICIADOS ENTRE 01/01/2004 Y 08/11/2005

			TITULO	FECHA ENTRADA	PROMOTOR
EOL	01	2004	PARQUES EOLICOS TARRAGONA IV-IX FASE II (TARRAGONA)	06/02/2004	CAPITAL ENERGY OFF SHORE, S.A.
EOL	02	2004	PARQUES EOLICOS CADIZ I-V. (246 MW) (CADIZ)	13/04/2004	CAPITAL ENERGY OFF SHORE, S.A.
EOL	03	2004	PARQUES EOLICOS CASTELLON I-VIII TM: VINARÓZ (384 MW) (CASTELLON)	19/04/2004	CAPITAL ENERGY OFF SHORE, S.A.
EOL	04	2004	PARQUES EOLICOS HUELVA I-VII (336MW) (HUELVA)	24/06/2004	CAPITAL ENERGY OFF SHORE, S.A.
EOL	05	2004	PARQUE EOLICO MARITIMO OFFSHORE "BANCO DE TRAFALGAR I-V". 250 MW) TM: CADIZ (CADIZ)	26/06/2004	NEK EOLICA S.L.U.
EOL	06	2004	PARQUE EOLICO MARINO POR PUNTA DE LENS EOLICA MARINA (30 MW) TM: MUROS ( A CORUÑA)	16/09/2004	PUNTA DE LENS EOLICA MARINA, S.L.
EOL	07	2004	PARQUE EOLICO MARINO PUNTA DE LAS OLAS EOLICA MARINA (40 MW)TM: CARBALLO (A CORUÑA)	16/09/2004	PUNTA DE LAS OLAS EOLICA MARINA
EOL	08	2004	PARQUE EOLICO MARINO "BAJO XIMIELA" (49.5) (A CORUÑA)	29/12/2004	NORVENTO S.L.
EOL	09	2004	PARQUE EOLICO MARINO "PIEDRA LA TOMASA" (40,5 MW). RIVEIRA (A CORUÑA)	11/01/2005	NORVENTO, S.L.
EOL	01	2005	PARQUES EOLICOS MARINOS AL ANDALUS I-X EN EL MAR TERRITORIAL FRENTE AL TM DE ALMONTE (CADIZ) (468MW)	21/02/2005	CAPITAL ENERGY OFF SHORE, S.A.
EOL	02	2005	PARQUES EOLICOS MARINOS EL ARRECIFE I-III EN EL MAR TERRITORIAL FRENTE AL TM DE DECHICLANA DE LA FRONTERA (CADIZ) (140,4 MW)	21/02/2005	CAPITAL ENERGY OFF SHORE, S.A.
EOL	03	2005	PARQUES EOLICOS MARINOS CARTAGÓ I-III EN EL MAR TERRITORIAL FRENTE AL TM DE CARTAGENA (MURCIA) (140,4 MW)	22/02/2005	CAPITAL ENERGY OFF SHORE, S.A.
EOL	04	2005	PARQUES EOLICOS MARINOS ATLANTICO I-V EN EL MAR TERRITORIAL FRENTE AL TM ISLA CRISTINA (HUELVA) (234 MW)	22/02/2005	CAPITAL ENERGY OFF SHORE, S.A.
EOL	05	2005	PARQUES EOLICOS MARINOS FRENTE A LA COSTA DE ALMERIA DENOMINADOS "MAR DE ALVORAN I, II, III Y IV"	16/03/2005	CAPITAL ENERGY OFF SHORE, S.A.
EOL	06	2005	PARQUE EOLICO MARINO CHIPIONA I, EN EL MAR TERRITORIAL FRENTE A TM DE CHIPIONA (CADIZ) (41,25 MW)	28/02/2005	ENEL UNION FENOSA RENOVABLES, S.A.
EOL	07	2005	PARQUE EOLICO MARINO CHIPIONA II, EN EL MAR TERRITORIAL FRENTE A TM DE CHIPIONA (CADIZ) (41,25 MW)	28/02/2005	ENEL UNION FENOSA RENOVABLES, S.A.
EOL	08	2005	PARQUES EOLICOS MIÑARZO I-IV T.M.: CARNOTA (A CORUÑA)	24/06/2005	CAPITAL ENERGY OFF SHORE, S.A.
EOL	09	2005	PARQUES EOLICOS: A MARINA I-IV T.M. FOZ (LUGO)	24/06/2005	CAPITAL ENERGY OFF SHORE, S.A.
EOL	10	2005	PARQUES EOLICOS: MAR DE LA JANDA I-XI T.M. VEJER DE LA FRONTERA (CADIZ)	24/06/2005	CAPITAL ENERGY OFF SHORE, S.A.



Map 1



Map 2

The next maps above show the areas of the locations of the said petitions (map 1 above) and where marine biodiversity seem to be of special value and where offshore marine protected areas should be declared (map 2 above); what should be the decision-making



process: a case by case EIA or a comprehensive national offshore wind parks plan or policy where the best sites are decided upfront? [ See also the *Informe 5/2006 de la Comisión Nacional de la Energía (CNE) sobre la propuesta de real decreto por el que se regula el procedimiento administrativo para la tramitación de las solicitudes de autorización de instalaciones de generación eólicas marinas* ]. The issue has reached the headlines of national newspapers and is becoming a “hot potato” to be taken care of in the near future by the Spanish Government



El parque eólico marino de Middelgrunden, a tres kilómetros del puerto de Copenhague, Dinamarca, es el más grande mundo de energía eólica marina.

### Dinamarca y Reino Unido lideran la técnica, nacida en 1991

El primer parque eólico marino del mundo se puso en marcha en 1991 en el mar Báltico y comenzó con 11 aerogeneradores. Desde entonces, aunque Dinamarca es la potencia líder en el mundo, principalmente en Europa, Alemania (con el parque eólico marino de Blyth, en el mar del Norte) y Reino Unido (con el parque eólico marino de Humbly Grove, en el mar del Sur) también han desarrollado parques eólicos marinos. El primer parque eólico marino del mundo se puso en marcha en 1991 en el mar Báltico y comenzó con 11 aerogeneradores. Desde entonces, aunque Dinamarca es la potencia líder en el mundo, principalmente en Europa, Alemania (con el parque eólico marino de Blyth, en el mar del Norte) y Reino Unido (con el parque eólico marino de Humbly Grove, en el mar del Sur) también han desarrollado parques eólicos marinos.

## España busca en la costa los mejores lugares para parques eólicos marinos

El Gobierno substará en 2008 las primeras zonas con una prima que duplica la eólica terrestre

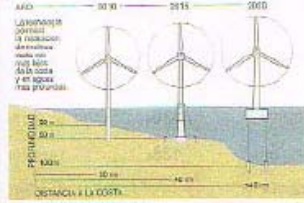
**EL PASO.** Madrid. La costa española puede volverse un nuevo escenario de energía de viento. El Gobierno ha anunciado la utilización de parques eólicos marinos con un efecto similar al que ya se está produciendo en tierra y al que España se compromete a duplicar antes de 2008 los 4.000 kilómetros de costa que ya tiene instalados en la zona. Entre los parques eólicos marinos se encuentran el parque eólico marino de Middelgrunden (en Dinamarca) para el que el Gobierno ha acordado un contrato de compra de electricidad por un importe de 1.000 millones de euros, el parque eólico marino de Humbly Grove (en Reino Unido) para el que el Gobierno ha acordado un contrato de compra de electricidad por un importe de 1.000 millones de euros, el parque eólico marino de Blyth (en Alemania) para el que el Gobierno ha acordado un contrato de compra de electricidad por un importe de 1.000 millones de euros, el parque eólico marino de Humbly Grove (en Reino Unido) para el que el Gobierno ha acordado un contrato de compra de electricidad por un importe de 1.000 millones de euros, el parque eólico marino de Blyth (en Alemania) para el que el Gobierno ha acordado un contrato de compra de electricidad por un importe de 1.000 millones de euros.

**La energía eólica en el mar**

**CAPACIDAD DE EXPLORACIONES 2007**

Presencia en proyectos

País	Países Bajos	Dinamarca	Reino Unido	Alemania	Francia	Italia	Portugal	Irlanda	Polonia	Países Bajos	Reino Unido	Alemania	Francia	Italia	Portugal	Irlanda	Polonia	
Países Bajos	13,70																	
Dinamarca		27,10																
Reino Unido			29,92															
Alemania				17,25														
Francia					14,80													
Italia						10,40												
Portugal							10,20											
Irlanda								10,20										
Polonia									11,64									
Países Bajos										0,87								
Reino Unido											0,58							
Alemania												0,30						
Francia													0,20					
Italia														0,20				
Portugal															0,20			
Irlanda																0,20		
Polonia																	0,20	
TOTAL																		46,78



El principal problema es que en España la producción del mar es aún mucho más pequeña que en otros países, ya que el viento en el mar es más constante y más fuerte. El principal problema es que en España la producción del mar es aún mucho más pequeña que en otros países, ya que el viento en el mar es más constante y más fuerte. El principal problema es que en España la producción del mar es aún mucho más pequeña que en otros países, ya que el viento en el mar es más constante y más fuerte.

El director general de Asesoría Empresarial Eólica, Alberto Cifra, señala que así en otros países como Dinamarca, Reino Unido o Alemania, donde se han desarrollado parques eólicos marinos, el coste de la electricidad generada es mucho menor que el que se genera en tierra. En España, el coste de la electricidad generada en el mar es aún mucho más pequeño que en otros países, ya que el viento en el mar es más constante y más fuerte.

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### 3.- Technology issues.

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 (Danish Wind Energy Association, 2003), and since

then its development has progressed dramatically (Nathanael D. Hartland). It is already a well established source of energy in Europe.

Windfarm	In operation (year)	Country	Power (MW)
<b><i>Sheltered waters and / or small projects</i></b>			
Vindeby	1992	Denmark	5
Lely	1994	Netherlands	2
Tunø Knob	1995	Denmark	5
Dronten	1996	Netherlands	11
Gotland	1997	Sweden	3
Utgrunden	2000	Sweden	11
Blyth Harbour	2000	United Kingdom	4
Yttre Stengrund	2001	Sweden	10
Middelgrunden	2001	Denmark	40
Rønland	2003	Denmark	17
Samsø	2003	Denmark	23
Frederikshavn	2003	Denmark	9
<b><i>First near shore wind farms, shallow waters</i></b>			
Horns Rev	2002	Denmark	160
Nysted	2003	Denmark	158
North Hoyle	2003	United Kingdom	60
Arklow Bank I	2004	Ireland	25
Scroby Sands	2004	United Kingdom	60

Source: Policy Workshop, Background Document, Development of Offshore Wind Energy in Europe, Egmond aan Zee, 30 September 2004, Netherlands.



European offshore wind projects developed by 2004 (source: International Energy Agency, Offshore Wind Experience, 2004)

As Krohn Soren has made clear in a study for the World Energy Council, the most interesting breakthrough in offshore technology has been new engineering technologies for the foundations, which show preliminary indications point to a 35 per cent decrease in foundation costs, due to the use of steel rather than concrete. “While concrete platforms tend to become prohibitively heavy and expensive to install at water depths above 10 metres, it appears that all of the new technologies will be highly economic

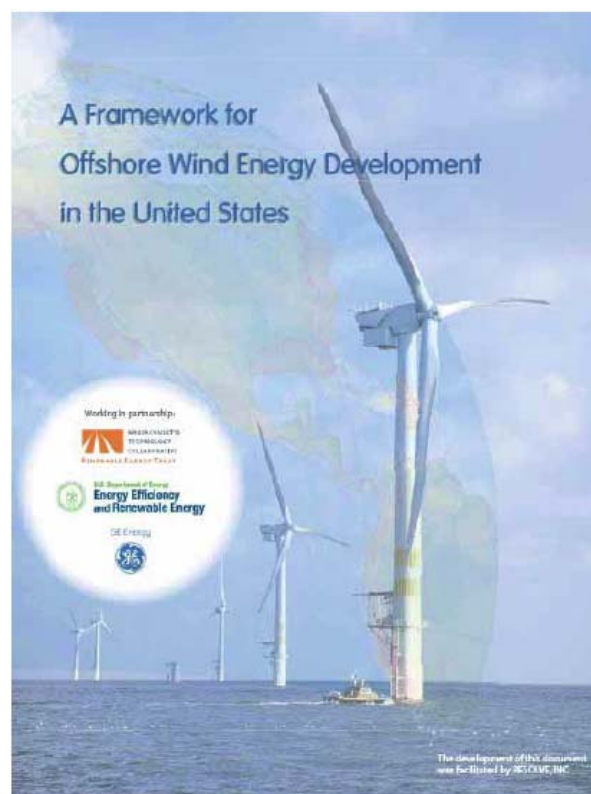
until at least 15 metres water depth, and possibly beyond such depths. In any case, the marginal cost of moving into deeper waters is far smaller than what was previously estimated. Corrosion protection of steel foundations can be done electrically, using so called cathode protection requiring little or no human intervention after the system is installed.”

Other technological and design innovations are related to the design change that allows a ten per cent increase in rotor speed, increasing the effectiveness of the turbines by some five to six per cent. This increases the noise level, although this is not a big concern.

Camouflage colours also make the turbines disappear completely when viewed from the shore with only a small amount of haze.

German companies are also introducing important technical changes [ See Sections on Works cited and additional & Online resources ].

The U.S. is developing in joint ventures with the industry (General Electric, Massachusetts Technology Collaborative, the State’s development agency for renewable energy and the innovation economy) on wind energy technologies in general and deep water technologies in particular (Kevin Dennehy & David Schoetz; Audra Parker 2005). What is the main focus of the DOE-GE project? Should the expectancies of a quick development of deep water offshore wind park technologies have a bearing on the decision concerning Cape Wind? Do they follow the same patterns of the research and development taking place in Europe on gravity, monopile, and tripod foundations?







# Deepwater Offshore Wind Technology Research Requirements

Walt Musial

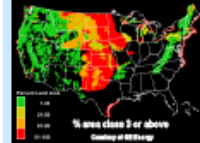
## Offshore Wind — U.S. Rationale Why Go Offshore?

- Why onshore sites are not close to coastal load centers
- The electric utility grid cannot be easily set up for interstate electric transmission
- Load centers are close to the offshore wind sites

### U.S. Population Concentration



### U.S. Wind Resource



## DOE Deepwater Wind Energy Workshops

Washington D.C. Oct. 15-16, 2003 –  
Washington D.C. Oct. 26-27, 2004

### Workshop Objectives

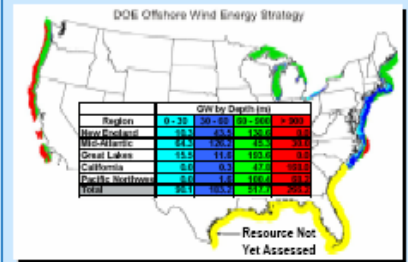
Leverage expertise and experience from offshore industries such as oil and gas, marine engineers, offshore wind, ocean structures, etc., to help identify key technology gaps to address a mature offshore wind industry in the United States.



### Key Technology Findings

- Monopiles are limited to 25m depths due to limits in structural stiffness and installation equipment capacity.
- Fixed-torque tower or sparacrafts substructures can transition into greater depths – e.g. Talltower Energy 42 meters.
- Floating platforms will be more economical in deep water but the cross-over depth must be determined by careful study.
- Added difficulties working at sea will become the major cost driver and must be mitigated by new technology.
- NET Ocean measurement techniques must be enhanced to accurately predict loads and energy production.
- Conceptual projects in the ocean will be essential to establish a basis for design.

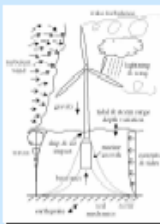
## U.S. Offshore Wind Energy Resource



## Offshore Turbine Design Basis

### Define external conditions

Measurements – Extreme wind, extreme wave, wind/wave combinations, sea state, wind shear, ice, currents, tide, soil mechanics, ship collisions, turbulence, wind farm turbulence.



### Design studies – Narrow the options

- What is the design load envelope
- What foundations achieve the lowest cost?
- What are the design drivers?

### Code development

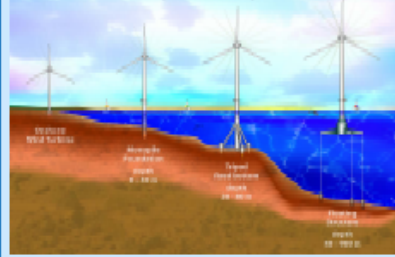
- Coupled platform/turbine responses
- Ocean Test Bed Validation

### Design standards

IEC, ABS, DNV, GL, API



## Offshore Wind Turbine Development for Deep Water



## Minimize Work at Sea

Offshore labor and equipment costs are key drivers. Current turbine designs use offshore practices.

High offshore availability will require turbine designs that are robust to inaccessible periods.

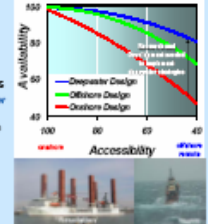
### Installation Strategies

- Standardize and mass-produce platforms and substructures
- Float-out whole systems
- Reduce large vessel dependency
- Develop low cost mooring systems

### Operation and Maintenance Strategies

As machines get larger and more remote smarter systems will become economical.

- Offshore turbines must close the loop between O&M and turbine design.
- High reliability designs
- Design for in-situ repair
- Remote condition monitoring
- Turbine self diagnostics
- Color and faster personnel transport



## Testing and Validation

- Scale model testing – Configuration tradeoff studies in wind/wave tank
- Hybrid testing – Wave simulations can be conducted in a subscale test-bed on land under real wind conditions to measure turbine response to rare load combinations.
- Full-scale blade and drivetrain test facilities – Large wind turbine components must be tested and verified before field deployment.
- Field testing – Full-scale test loads in real ocean environments are essential.
  - Certification
  - Code validation
  - Safety verification

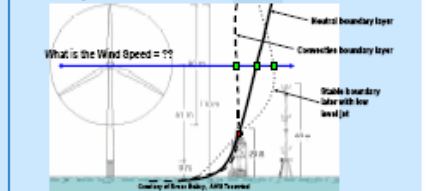


## FY 2005 DOE Offshore Wind Energy Activities and Funding



## Understanding Offshore Wind

- Develop new measurement techniques and sensors for accurate wind speeds at heights where wind turbines operate – Without MET towers!
- Understand and utilize available offshore data sets – Offshore MET measurements may come from many sources.
- Validate wind speed potential – From meso-scale to micro-scale.
- Validate profile variations (wind shear) – Profiles may change with wind speed, season, and time of day.



## Offshore System Optimization

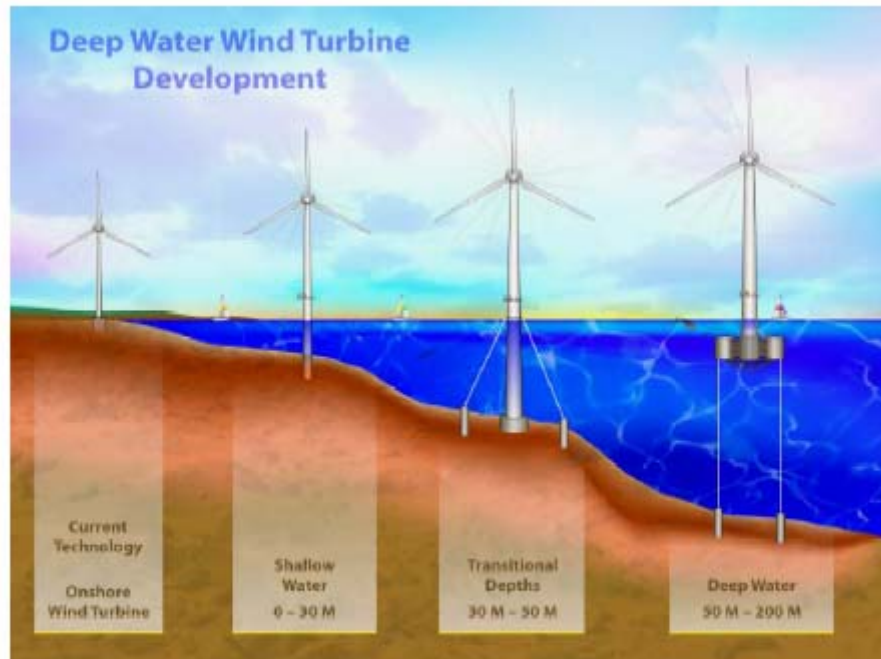
- Higher speed rotors (lower aerodynamic noise constraints) will lower system weight and increase energy capture.
- Larger turbine sizes can lower offshore balance of station and operation and maintenance costs.
- Lower shipping and erection constraints may favor direct drive, yawing platforms, etc.
- Greater weight penalties on floating systems will drive use of lighter materials (e.g. extended use of composites in towers, hubs, bedplates, shafts) and multi-tower systems.
- Wind/wave/hydrogen storage energy technology convergences may spawn new energy supply models



The information contained in this poster is subject to a government license. Prepared for the American Wind Energy Association (AWEA) WindPower 2005 Conference, 15-18 May 2005, Denver, Colorado NREL/PO-500-38135

## Summary

- U.S. offshore wind energy potential is over 1000-GW.
- U.S. offshore wind resource is complementary to the on-shore wind resource due to geographic separation.
- U.S. deepwater wind technology is necessary for full offshore wind energy deployment.
- Offshore experience in shallow water is essential for deepwater technology to move forward.
- Expanded R&D (technological and environmental) is necessary for cost-effective deepwater wind energy.
- Commercial deepwater technology will take 10-15 years to develop.



**Figure 2 – Progression of Expected Wind Turbine Evolution to Deeper Water**

Courtesy of Walt Musial & Sandy Butterfield, from the NREL, “Future for Offshore Wind Energy in the United States” (see Sections on Works cited and Additional & Online Resources)

#### **4.- Climate change policies and wind energy development.**

Cape Wind Associates LLC 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, 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.

Massachusetts is one of the most active States promoting climate change policies. Even with its former Republican Party administration, it led the litigation against the Environmental Protection Agency which ultimately resulted in the Supreme Court decision which mandated the Agency (EPA) to begin regulating the emissions of four greenhouse gases, including carbon dioxide, under §202(a)(1) of the Clean Air Act, which requires that the EPA “shall by regulation prescribe . . . standards applicable to the emission of any air pollutant from any class . . . of new motor vehicles . . . which in [the EPA Administrator’s] judgment cause[s], or contribute[s] to, air pollution . . . reasonably . . . anticipated to endanger public health or welfare,” 42 U. S. C. §7521(a)(1). *Massachusetts et al v. EPA et al*, Case 05-1120, decided in April 2, 2007. The former Governor, though, did not back the project. Are these sitting decisions inextricably linked to politics, or is there a need to in-depth analysis of the intricacies of climate change policies?

The well known libertarian think tank, the Cato Institute, headquartered in Washington, D.C., whose stated mission is "to broaden the parameters of public policy debate to allow consideration of the traditional American principles of limited government, individual liberty, free markets, and peace" by seeking greater involvement of the "lay public in questions of public policy and the role of government", opposes the project. It states that the use of climate change to decide on Cape Wind is a clear mistake and introduces confusion on the main policy that climate change should entail. The internalising of environmental costs by the energy production industry. Why is it that a clearly undisputable source of renewable energy, which reduces dramatically greenhouse gas emissions, is contested also by backers of climate change policies? Or is it the Cato Institute really does not back climate change policies? [See Section on Links to Online Resources ]



Its Senior Fellow, Jerry Taylor, holds that: 1) Cape Wind won't cut the oil dependency. Oil is mainly used for transport and wind mills aren't (only 1% of electricity production in the US is based on oil. 2) It is tax broken (tax shelter). Corporate welfare. 1.3bUSD for nukes. 1.2 for oil.1.6 for CCTs, but the difference is that the subsidies don't affect the prize of oil or coal. While only 1/3 of the revenues needed for wind come from consumption. The oil industry should be forced to internalise its emissions (via taxes) and all subsidies removed. Then, once subsidies are removed for all the energy sources, the market will run free and will tell us which is the most efficient in socio-economic terms. 3) Cape wind has a major weakness: unreliability. The biggest problem for the grid is not the number of energy production facilities but how to deal with peaks of demand (e.g. 3PM in summer, for air conditioning, while wind blows at night and in winter). [ WBUR debate ] Are these arguments flawed conservative ideology? Even if that is the case, shouldn't they be openly addressed and seriously dealt with?

##### **5.- Some economics: subsidies and contingent valuation.**

In October 2003, the Beacon Hill Institute at Suffolk University published *Blowing in the Wind: Offshore Wind and the Cape Cod Economy*. In that study, authors Jonathan Haughton, Douglas Giuffre and John Barrett reported and interpreted the responses of a thousand tourists and home owners surveyed over the course of the preceding summer. The purpose of that study was to assess the principal effects of the wind farm on the Cape Cod economy. The findings were:

- 1) There would be a small decline in tourism, causing the loss of 1,173 to 2,533 jobs.
- 2) According to homeowners, property values would fall by 4.6% or by \$1.35 billion.



3) According to an overwhelming majority of tourists and homeowners, the wind farm should be required to pay a royalty to operate on Horseshoe Shoal. On the average, homeowners suggested a royalty of 8.06% and tourists a royalty of 7.66% of sales.

Is contingent valuation a good economic technique in order to produce a sound cost-benefit analysis in these kinds of projects?

In March 2004, The Beacon Hill Institute published a second study attempting to provide “a comprehensive framework within which it is possible to assess at least the most important of the economic costs and benefits in a systematic, objective fashion.” Its results were crystal clear: the study stands as warning, therefore, against offshore wind power anywhere along the U.S. coastline, not just at this site. Cape Wind may prevail in its efforts to build in Nantucket, but it will be despite, rather, than because of any benefits to the greater society. *“The economic costs of the project, in present value terms, come to \$947.2 million. The economic benefits come to \$735.5 million. The costs exceed the benefits by \$211.8 million (the difference owed to rounding). Based on these numbers, it does not make sense, from a societal point of view, to build the project. The wind may be free, but wind power from Nantucket Sound is costly.”*

Despite being economically undesirable, the project would be privately profitable because of the very large subsidies that it would receive. The most important subsidies would stem 1) from the “**green credits**” that result from recent changes to the law in Massachusetts (electricity consumers in the Commonwealth are required to buy a growing proportion of their electricity from new renewable sources, requiring them, in practice, to pay a premium for their power; this premium will raise the price received by Cape Wind, normally 4.7 cents per kilowatt hour (kWh), by about 2.5 cents/kWh and amounts to a total subsidy (in present value terms) of \$157 million from Massachusetts ratepayers) and 2) from the **Federal Renewable Electricity Production Credit (REPC)** [which expired in 2003 but was reinstated by the Energy Policy Act], which is likely to raise the “levelized” (revenue per kWh, in present value terms) revenue by a further 0.8 cents/kWh and represents a total subsidy of \$84 million.



Are these arguments sound economics? The issue of wind energy and excessive subsidies is not only present in offshore wind parks. It is a general complaint, that

concerns wind energy and renewable energies in general. For example, at the other side of the spectrum, the Renewable Energy Policy Project (REPP), a think tank funded by institutions such as the Energy Foundation, the Oak Foundation, the SURDNA Foundation, the Turner Foundation, the Bancker-Williams Foundation, the Joyce-Mertz-Gilmore Foundation, the United States Department of Energy, the National Renewable Energy Lab, and the United States Environmental Protection Agency, supports the advancement of renewable energy technology through policy research. Its findings are astonishing: “In their first 15 years, nuclear and wind technology produced roughly the same amount of energy (2.6 billion and 1.9 billion kilowatt-hours, respectively), but the subsidy to nuclear outweighed that to wind by a factor of over 40, at \$39.4 billion to \$900 million. It may be that this differential contributed to a more mature nuclear sector, as reflected in its much more rapid growth; by 1999, nuclear generation totalled 727.9 billion kWh annually, while wind generation totalled 3.5 billion kWh.” (Marshall Goldberg, REPP).



The Congressional Research Office reports are signalling the risks of the constant reduction of the funding of renewable energies (Reports of October 2004, and January 2005 and 2006). Is this a wise long term policy?

In Spain, the excessive profits made by the market-based subsidy system established in 2004 forced the government even to review the economic regulatory basis of projects already in place with allegations of unconstitutionality as *ex post facto* (retroactive) laws. Should such high subsidies be maintained in order to foster non fossil fuel based energy systems?



## 6.- Birds and offshore wind parks.

One of the most popular assertions against offshore parks is the potential impact on birds. The Audubon Society’s statements are also very clear: there is no significant impact at all (see WBUR Debate). Nevertheless, some local NGOs contest this statement. Many species of birds cross Nantucket Sound during migration, according to

the Massachusetts Audubon Society, and some are of rare or endangered species, like the roseate tern. Bird studies show that migrating birds usually fly between 1,000 and 5,000 feet off the ground, which would be safe since it is high above the turbine blades. But Jessica Almy of the Cape Wildlife Center, a program of the Humane Society, raises legitimate concerns: "We don't know enough yet about the details of their flight patterns. Do they fly that high when crossing water? And how soon after taking off from Cape Cod do they reach cruising altitude? And does weather affect the height at which they fly?"



Roseate tern.

Who is right? Is it a yes/no question? A review of all the research projects taking place in Denmark, Germany and the United Kingdom, as of 2004, shows that these issues are still subject to research in Europe (Elke Bruns et al). Some other documents, such as SEO's statement (the Spanish Branch of Birdlife International), or the American Bird Conservancy's Wind Energy Policy seem to be less categorical than The Audubon Society's direct approach (See SEO/Birdlife, 2006). Does this imply that there is no clear-cut answer to these impacts?

What are the conclusions of the EIA conducted by the Army Corps of Engineers? Has the MMS included the review of these aspects in the EIA that it is preparing (See the Notice of Intent)?

What is the appropriate methodology to correctly assess these impacts?



SEO/BirdLife



## **7.- War within the environmental NGOs.**

*“Nothing illustrates the complexity of this conundrum better than the way it has divided the activist community. On the anti-wind-farm side, you have the Humane Society, Massachusetts Audubon Society, the International Fund for Animal Welfare, and the International Wildlife Coalition; on the pro-side, Greenpeace, the Union of Concerned Scientists, and the Conservation Law Foundation.”* (Amanda Griscom, “RFK Jr. and other prominent enviros face off over Cape Cod wind farm.”). *“This controversy all boils down to how you balance your concerns,”* says Nathanael Greene, a wind expert at the Natural Resources Defense Council who has been researching the Cape Cod project. *“Environmentalists are unanimously in favor of reducing greenhouse emissions and protecting birds and pristine vistas and so forth. But we have to make tradeoffs. We have to decide what's most important.”* The Natural Resources Defense Council will not take an official position on the project until the review process is complete, but its first approach is that many of the environmental objections to the wind farm will probably be unfounded.

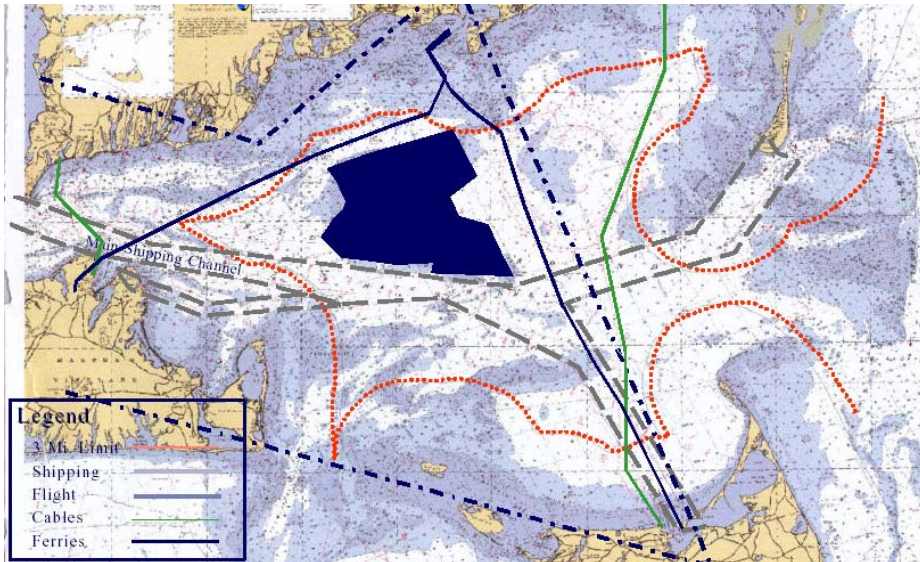
These same controversial aspects seem to be universal whenever wind parks are planned. It may end up being that wind parks imply by definition the inherent contradiction between two very strong environmental values: landscape (seascape) versus sustainable energy. At the end of the day it has forced true environmentalists to make a very hard choice (see the Section on Guiding Students’ Discussion)

## **8.- Public safety**

“Searches for small vessels or people in the water (PIW) and smaller search objects will be particularly affected due to the higher helicopter and fixed wing search altitudes required. The probability of detecting these targets will be decreased due to the presence of the wind farm. Additionally, the presence of the towers and their rotating blades will significantly diminish the ability to hoist victims by helicopter in the area of the wind farm.” (U.S Coast Guard statement, reproduced from the web page of the Alliance).

Navigation and aviation traffic risks seem to have been underestimated. The project would be directly adjacent to a major shipping lane. A tanker loaded with tens of thousands of gallons of fuel products visits the Nantucket and Martha’s Vineyard monthly. Passed events show that even without the wind park these accidents are not uncommon on this area: in December 15, 1976 the tanker Argo Merchant ran aground southeast of Nantucket Island, Massachusetts spilling 7.7 million gallons of oil. In April 2003, a Bouchard barge carrying oil for the Mirant Canal Generating Plant ran aground, and in the process killed 450 birds and shutdown 100,000 acres of shell fishing beds.





The Steamship and Hy-Line ferries, which transport roughly 3 million passengers each year, are critical of placing an industrial power plant in the middle of Nantucket Sound. Some reports claim that, after construction, the entire 24-square mile area could be closed to all fishing throughout the project's life due to the significant navigational risk.

The Federal Aviation Administration is also looking carefully to the risks associated with the turbines (potential interference from wind turbines to the air traffic control radar systems).



How is the MMS planning to address these issues? How are they evaluated in classic EIA processes?

### 9.- Fisheries & tourist businesses

For fishermen, certainly, Cape Wind is no joke. They are altogether in this debate. Shareen Davis's family have lived and fished near Chatham on the cape for thirteen generations. She says the wind towers will destroy her local fishing grounds and endanger birds and sea animals, but her worries carry her beyond her own business: "I know that [the windmills] are going to impact all of the different aspects of the environment, of the aesthetics, of the infrastructure, of the business of the Cape," she says. "It will be something that will critically change our area. Why should I have to be collateral damage to something like that?" (CBS)



After initial meetings, the participants (Massachusetts Fishermen's Partnership and fishermen of Provincetown) agreed to a somehow moderate outcome: they "felt strongly that the impacts should be systematically investigated before continuing with this project, or any project that may alter traditional economic use of coastal waters" (Madeleine Hall-Arber et al.)



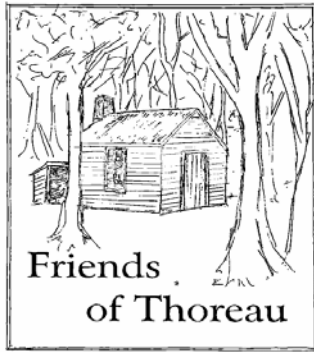


Some think that the whole area will be closed to fishing. Others think that the grid pattern of the farm could lead to dangerous gear conflicts between mobile fishermen by disrupting the traditional fishing patterns. According to Kennedy, the project could have an over \$1 billion impact on the local fishing industry and the tourist economy, given the blighted views and obstacles it would pose to the thousands of recreational sailors who visit Nantucket Sound annually.

Can these two variables be balanced against the benefits of the windpark? Some analysts consider that *“the primary regulatory mechanism for mediating among conflicting uses of the coast and coastal ocean--the Coastal Zone Management Act of 1972--is highly decentralized and subject to a disorganized array of project veto opportunities. State coastal zone programs may not sufficiently account for wind generation's broad environmental benefits. Thus, regulatory outcomes-- fuelled by inapt analogies to a history of offshore oil and gas exploitation-- will disfavor this clean energy source. Federal and state authorities should better coordinate their coastal management programs to enable responsible siting where near-shore wind power potential is most promising”* (Robert H. Russell). Does the process put in place by the Energy Policy Act of 2005 provide an adequate alternative framework to the CZMA?







## **Cape Cod Offshore Wind Park, the Multivariate Nature of Energy Policy Issues.**

ENRIQUE ALONSO & ANA RECARTE  
Friends of Thoreau Environmental Program  
Research Institute of North American Studies  
University of Alcalá, Spain.

[Main Page](#)  
[Scholars' Debate](#)  
[Links to Online Resources](#)  
[Acknowledgements and Illustration Credits](#)  
[Works Cited and Additional Bibliography](#)

### **GUIDING STUDENTS' DISCUSSION**

#### **1.- The politics of celebrities.**

One of the facts that have contributed to make Cape Wind famous is the involvement of Robert F. Kennedy Jr. in the debate. The the third of eleven children born to Ethel Skakel Kennedy and Robert F. Kennedy, senior attorney at Natural Resources Defense Council, Professor of Pace University School of Law School, and author of *Crimes Against Nature* (an diatribe against the Bush Administration environmental record), published, on December 16, 2005, an editorial article in the *New York Times* ("An Ill Wind Off Cape Cod"), arguing that the wind farm would mar a precious seascape, privatize a publicly owned commons, and damage the local economy.

The article prompted about 150 environmental authors and activists to circulate an open letter (January 3d, 2006) asking Kennedy to reconsider his position. "We are, simply put, in a state of ecological emergency," it read. "Constructing windmills six miles from Cape Cod, where they will be visible as half-inch dots on the horizon, is the least that we can do."

Some of them went a step beyond the style of the letter and conducted a more personal

attack asking, in The San Francisco Chronicle, December 21, 2005, for Kennedy to step down from his position at NRDC, criticizing its family: "the privileged patricians of a generation for whom building mansions by the sea was indistinguishable from advocating for the preservation of national parks or big game hunting in the wilds of Africa." On its turn, it triggered a response by Kennedy in The Chronicle.



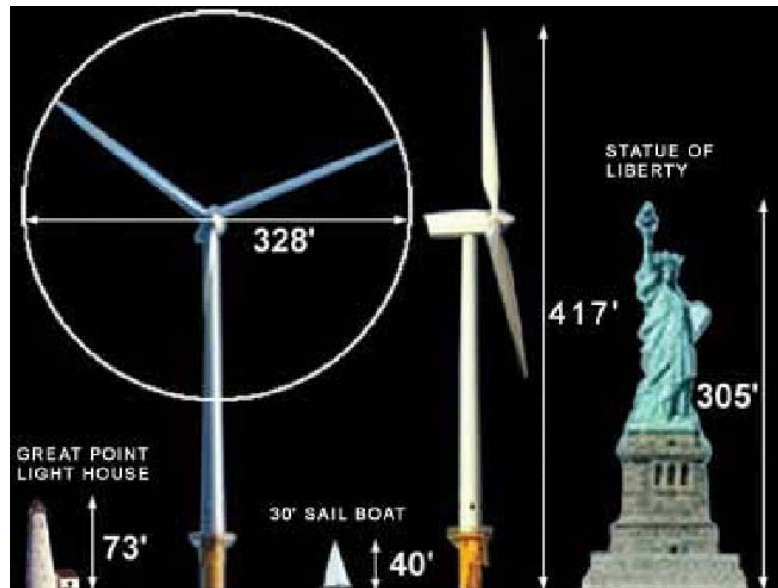
Kennedy's approach to the wind park adopted the limited opposition of the uniqueness of the place: "*[S]ome places should be off limits to any sort of industrial development. I wouldn't build a wind farm in Yosemite National Park. Nor would I build one on Nantucket Sound ... All of us need periodically to experience wilderness to renew our spirits and reconnect ourselves to the common history of our nation, humanity, and to God.*" It is a very badly sited project that will end up hurting the battle against global warming, not advancing it. His primary concern is not the project's impact on wildlife and ocean views, but the economic impact it would have on the local fishing community. The same approach was taken by another celebrity, one of Martha's Vineyard most famous residents, former CBS Walter Cronkite. "Our natural treasures should be off limits to industrialization, and Nantucket is one of those treasures," says Cronkite (CBS, June 29, 2003)

Is Kennedy's or Kronkite's position simple NIMBYism as Greenpeace USA claims? Representatives from the Cato Institute find funny that environmental organizations as Greenpeace support the idea that aesthetics and respect for a marine sanctuary are not important values; and that locals have no say on what goes on in public lands around them !!

Is it all an issue of class? It seems so, at least partially (Margot Adler; Wendy Williams). Conservation Law Foundation's Seth Kaplan says the wind farm shouldn't be stopped just because it's in the back yard of the wealthy (CBS, June 29, 2003).

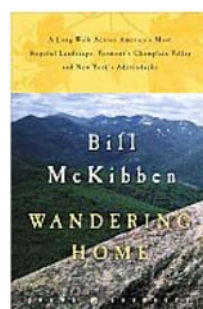
## **2.- Aesthetics.**

Each of the poles and blades will be almost as high as the Statue of Liberty, which stands at 305 feet.



The visual impact of wind parks do not seem to be very strong. “A blip on the horizon — barely visible when viewed from the nearest beach”, as Jim Gordon says. But, even if they are, and if they imply the degradation of wilderness, are wind parks to be stopped because for this reason?

But aesthetics can be appreciated in different ways . The students should analyse the words of the Middlebury College Professor, Bill McKibben (See Section II of the Main Page), who depicts the wild landscape of the crests of the Adirondacks filled with turbines as “symbols to take reesponsibility”. Is this approach valid? Shouldn’t cultural landscapes be preserved as having objective value? Are all landsca policies inevitably subjective? Can the protection of landscapes become a “public policy”? The students should be introduced, as an example, to the policies embedded in the European Landscape Convention of Florence, 2000, sponsored by the Council of Europe.



### 3.- Energy supply coverage.

A more simple economic/engineering approach to Cape Wind is the analysis of its contribution to energy supply at the regional level. The Cape Wind proposal is relatively unique in that it would directly offset petroleum usage, unlike most of the country, where electrical power generation from oil is not rare. The project overview



states that the proposed project would provide a utility-scale renewable power source that would make a significant contribution towards meeting the Independent System Operator – New England (ISO-NE) system energy needs, and, contribute towards the renewable energy technology requirements of state and Federal mandates and goals by interconnection with the New England transmission and distribution system.

The proposed project would help to address the need for new renewable energy supplies in Massachusetts and New England to advance achievement of the Massachusetts Renewable Portfolio Standard (RPS); improve fuel source diversity of the power supply in Massachusetts; provide a new source of competitive market power to the New England region consistent with the goals of the Electric Industry Restructuring Act of 1997; and, help to buffer increases in retail energy costs to consumers resulting from existing and future fossil fuel price volatility. In its May 10, 2005 Final Decision, the Energy Facilities Siting Board stated “the power from the wind farm is needed on reliability and economic grounds, and to meet the requirements of Massachusetts and regional renewable portfolio standards” (EFSB, 2005).

Additionally, the Department of Energy (DOE) has identified the need for additional sources of energy to offset New England’s dependence on natural gas. DOE is concerned that the increased demand for natural gas will exceed its supply, leading to shortages and higher energy prices. The reliability of transporting natural gas by pipeline to generating facilities during winter peak periods has become a concern due to the inadequate capacity of the pipeline structure serving New England. The pipeline system that was originally designed to supply industrial and heating uses, now supplies 41% of New England’s electricity needs. Declining natural gas reserves in North America, coupled with infrastructure investments needed in the delivery system, will increase the price of electricity. Canada, a ready source of natural gas in the past, is experiencing its own demand growth for natural gas and may not be able to reliably and cost effectively supply the United States with natural gas (An Energy Market Assessment, 2004). Wind power could be an additional energy source that would reduce the area’s dependence on natural gas, thereby increasing energy reliability and lowering its price.

Based on a review of historical ISO-NE data on proposed / planned interconnection and long term firm point-to-point transmission service requests to ISO-NE, the energy generating capacity of new utility-scale and regionally significant energy facility projects that have been permitted or are presently being studied for interconnection with the regional power grid have generating capacities that range between 200 and 1,500 MW. This is enough to meet the needs of 400,000 homes, or about 75 percent of Cape Cod, Martha's Vineyard, and Nantucket island. The project is expected to produce an average of 170 megawatts of electricity at any given time.

The problem of the deficit of New England energy supply (which becomes a national emergency issue in the middle of winter) is a well known historical fact. (See the Regional Energy Challenges analysis in Chapter 1 of the Bush Cheney Plan, in the Section on Links to Online Resources).

Are these arguments convincing enough? What has the Alliance to say about this regional energy issue?

#### 4.- Neighborhood fights and some humour: “the Windscape Competition”.

As Section II of the Main Page showed, Cape Wind locals are not all of them opposed to the project.

The Boston Society of Architects came up with an idea to try to narrow the gaps. It launched a contest on how a wind farm could become more than just a utility for Cape Cod; a sort of new tourist attraction, one that both educates and entertains (William Richards)



The result (65 “solutions” from 11 countries), notwithstanding the impartiality of the Society’s approach, may look humorous but, was Windscape really a serious attempt or simply a joke? Don’t the awards for the first prize winners (a kind of theater-in-the-round: an enormous ring, composed of promenades, ramps and event stages, is inscribed within a field of turbines) and the special citation (“Martucket Island Resort and Theme Park” a sort of Costner’s movie Waterworld structure) rather reflect, and very sadly, the limits to architecture, as and art and/or a science, to serious problems in which infrastructure and wilderness are fiercely face each other? Some proponents of the project argue that it could actually attract tourists who would want to see the nation's most ambitious symbol of a clean-energy future. (It's not as nutty as it sounds -- offshore wind installations in Ireland and Denmark have proved a boom to tourism, not a setback.)



First Prize “e50\_energy island”, by Paul Michael Pelken & Markus Hermann, of Energy Design, Boston



Special Citation, “Martucket Island Resort and Theme Park”, by Jay Critchley of Provincetown, MA and John Paul Raymond of Leicester, MA

**5.- The collapse of fisheries in New England.**

Item 9 of the Section on Scholars’ Debate has highlighted the risks that the approval of Cape Wind might entail for the Sound fisheries.





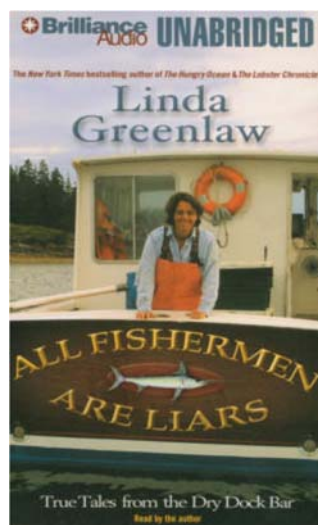
The conflictive status of New England fisheries in the northern cape of Massachusetts, Cape Anne, is a well documented regional history of a process that, on its turn, is a simple local anecdote of on of the global emergencies: the collapse of global fisheries.

There are scientific and policy issues on how to deal with it both at the local level (see Environmental Entrepreneurs, Hennessey & Healey, Ronald Bailey, Eleanor Dorsey...) and at the global level (See Oceana). The students should try to strategize how such policies for halting the decrease in fish populations (and even restoring them) can be designed and implemented. [ Some guidance can be found in The Internet Guide to International Fisheries Law. See the Section on Links to Online Resources ]

The human aspect has been also well documented and been subject of literary and artistic works. The Perfect Storm, both the novel by Sebastian Junger, and the famous Wolfgang Petersen´s (Warner Bros.) Clooney film, have the collapse of the fisheries as the background story for the novel and script. The mood in Gloucester, Cape Anne´s fisheries center, is very well reflected in both of them.



Farther up north, the disastrous Canadian and US policies in the Gulf of Maine are also well documented. From a literary point of view the success of writers such as Linda Greenlaw (See e.g. “All Fishermen Are Liars: True Adventures at Sea. True Tales from the Dry Dock Bar”) explain the depth of the human dimensions.



Students could be introduced in Ecocriticism as a literature movement (1996: *The Ecocriticism Reader*, edited by Cheryll Glotfelty and Harold Fromm; Ecocriticism, Wikipedia, and the works on this area of research of the Friends of Thoreau American Environmentalism Program of the Instituto Universitario de Estudios Norteamericanos de la Universidad de Alcalá, Madrid, Spain) by taking any of those books as a starting point.

## **6.- An introduction to U.S. federalism.**

Sometimes looking at real ongoing events show more about one of the main pillars of American constitutionalism, federalism, than thousands of political essays.

In Section IV of the Main Page, the interconnections of MEPA and NEPA are so sophisticated that students may have it difficult to figure out who really will decide if the project is permitted and on which conditions: the Federal Government of the Commonwealth of Massachusetts?

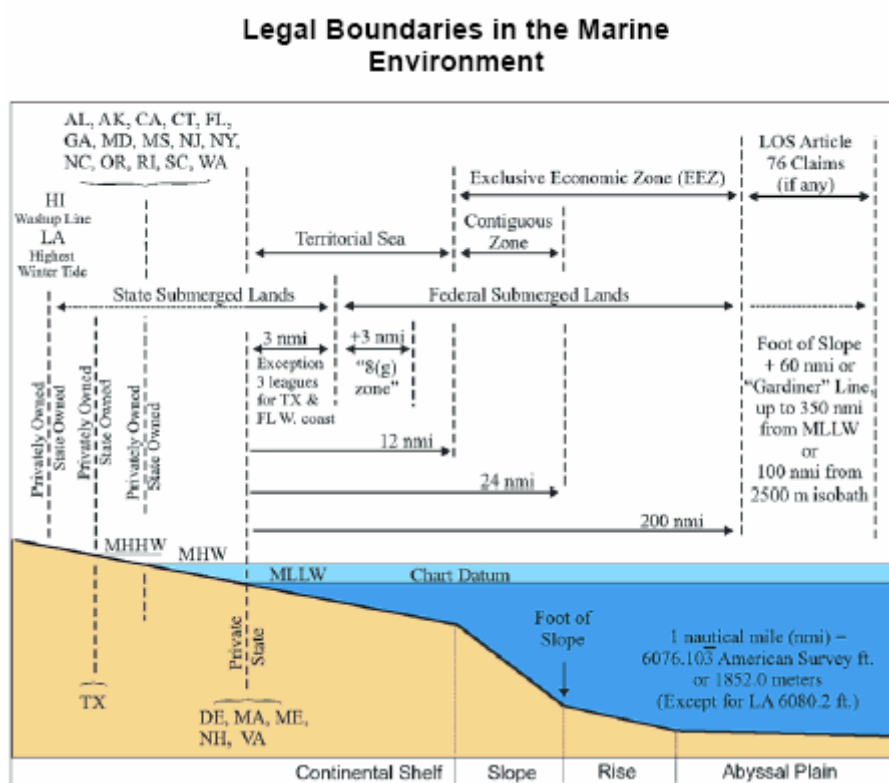
Environmental Impact Assessment originated in the National Environmental Policy Act (NEPA), enacted in 1969. Certain actions of federal agencies must be preceded by an *Environmental Impact Statement* (EIS). NEPA requires that plausible statements as to the prospective impacts be disclosed in advance. The purpose of NEPA process is to ensure that the decision maker is fully informed of the environmental aspects and consequences prior to making the final decision.

NEPA requires EIS to be written for “all major federal actions which may have a significant impact on the environment”. The Massachusetts Environmental Policy Act (MEPA) Office is an agency of the Commonwealth of Massachusetts, through which environmental impact reviews of certain projects requiring state agency action are conducted. Agency actions include granting state permits or licenses, providing state financial assistance, or transferring state land. It requires that state agencies study the environmental consequences of their actions, including permitting and financial assistance. It also requires them to take all feasible measures to avoid, minimize, and mitigate damage to the environment. MEPA further requires that state agencies "use all practicable means and measures to minimize damage to the environment," by studying alternatives to the proposed project, and developing enforceable mitigation commitments, which will become permit conditions for the project if and when it is permitted. The Act applies to projects above a certain size that involve some state agency action. That is, they are either proposed by a state agency or are proposed by municipal, nonprofit or private parties and require a permit, financial assistance, or land transfer from state

Students should answer a simple question: which projects are submitted to Federal environmental impact assessment and which others to State environmental impact assessment. Are some projects submitted to both? How do Federal and State authorities try to minimize duplication of processes that imply millions of taxpayers dollars?

Environmental impact assessment (EIA) has as main function to assess how a project impacts the environment in order to determine if the costs are worth the benefits of the

project and which conditions can be placed so that the impacts are minimized. Are EIA policies resolved via conflict between Federal and State authorities or do they both put in place cooperation mechanisms?



Another example is the power (and even ownership or trust) of the sea. Are the US territorial waters – 12 nautical miles- (and the sovereign rights beyond those waters – Exclusive Economic Zone, 200 miles; continuous zone and continental shelf-) controlled by the Federal Government or by the coastal States of the Union?

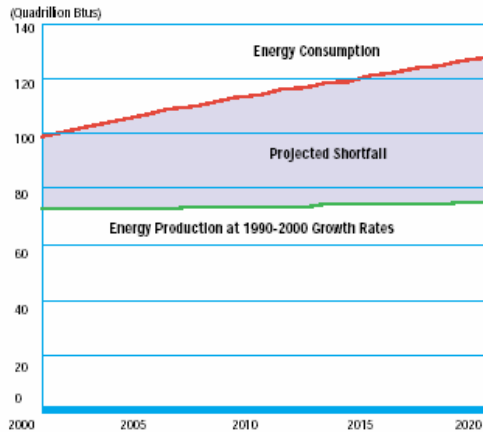
The figure above, taken from the MMS Marine Cadastre mapping initiative described in item 2 of the Section on Scholars Debate, tries to summarize the situation in the coasts of the US by looking at the powers of all coastal States. The general rule is that the States exercise full power in the first three nautical miles from the coast. Where does this distribution of territorial power come from? Is it in the U.S. Constitution? Is it based on a Federal Statute? Has the colonial history of the first thirteen States of the Union anything to do with it?

**7.- Broader energy issues.**

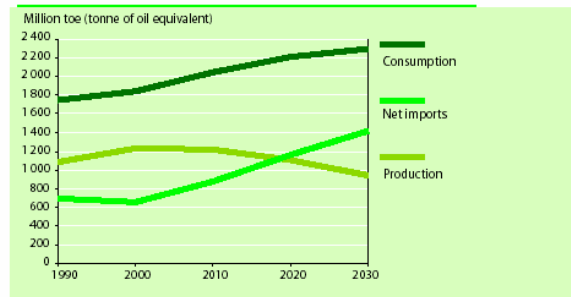
The U.S data on the distribution of energy sources of primary and secondary energy (electricity), both in generation and consumption, are very similar to those of Europe as a whole. The U.S is barely more than 50% deficient, daily, on oil. The European Union has a larger problem. Both have rich energy neighbours. Canada and Mexico do

extensively provide the U.S. with both oil and natural gas. Russia (the first natural gas producer and the second oil producer of the world) and North Africa do extensively provide Europe with energy.

### Growth in U.S. Energy Consumption Is Outpacing Production



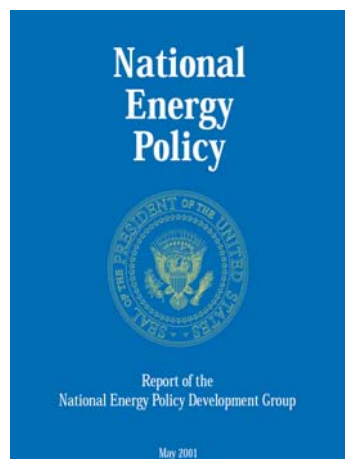
### EU-30 — Energy balance



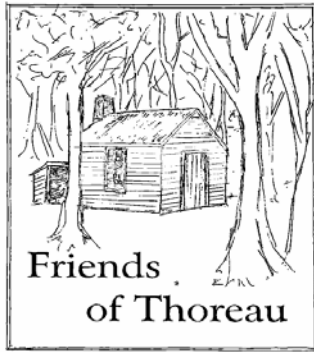
The International Energy Agency provided “the Western World” with a strategic reserve mechanism of collaboration for extreme cases. According to a March 2001 agreement, all 26 members of the International Energy Agency must have a strategic petroleum reserve equal to 90 days of oil imports for their respective country. Only net-exporter members of the IEA are exempt from the reserve requirement. The exempt countries are Canada, Denmark, Norway, and the United Kingdom. Denmark and the U.K. have both recently created strategic reserves due to their requirements as European Union members. But the problem is the reality of daily life and the reality of the depletion of fuel based energy (oil, natural gas, coal, in this order) in the next hundred years (50 to 80, 100, and 250 respectively).

The exponential growth in demand by countries such as India and China may even increase the rate of depletion.

What are the strategies of the US compared to those of the European Union on midterm supply and on alternative energies? Is Cape Wind project a symbol of this gigantic problem?







## **Cape Cod Offshore Wind Park, the Multivariate Nature of Energy Policy Issues.**

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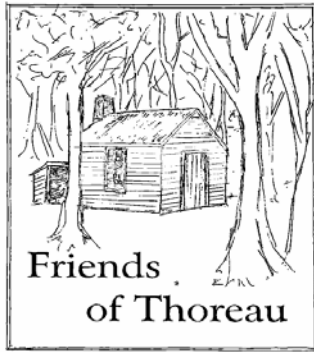
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### LINKS TO ONLINE RESOURCES

The frequently cited “**WBUR debate**” was aired in WBUR Boston, WGBH Islands and the Cape, on August 12, 2006. It is really a program from **Justice Talking**, the public radio show about law and American life, from National Public Radio (NPR). Its title is “**Wind Power, The Wave of the Future?**”, Release Date August 7, 2006. It has the transcript, a description of the persons interviewed, an overview and additional pieces of information. It can be fully heard from

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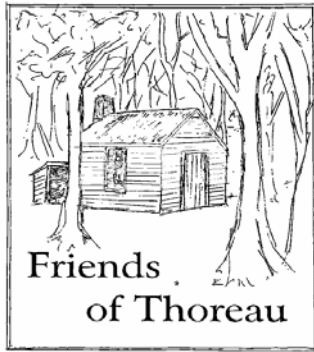
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The power point presentation can be found in [http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/workshops/2005\\_summit/musial.pdf](http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/workshops/2005_summit/musial.pdf)

- On offshore wind power deployment in Germany [http://www.bmu.de/files/pdfs/allgemein/application/pdf/offshore\\_wind\\_deployment\\_de\\_en.pdf](http://www.bmu.de/files/pdfs/allgemein/application/pdf/offshore_wind_deployment_de_en.pdf)



## **Cape Cod Offshore Wind Park, the Multivariate Nature of Energy Policy Issues.**

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