

# Wind Energy in State Coastal Waters



**Wind Energy in New England Islands  
and Coastal Communities  
December 4-5, 2002**



# Context for Wind Energy: Power System Challenges

- Reduce greenhouse gas emissions by *at least 50%*
- Cut emissions of regulated pollutants
  - Particulates (deaths and disease)
  - Nitrogen oxides (acid rain, ozone smog, eutrophication)
  - Sulfur dioxide (acid rain)
  - Mercury (poisoning fish)
- Reduce other harm to marine and terrestrial environments from fossil fuel extraction and transport, power plant operations



# Renewable Energy in New England's Climate Strategy

- 1) Displace fossil fuel generation – new combined-cycle natural gas plants do not do enough
- 2) Replace nuclear plants
  - 4 closed so far
  - Remaining plants (1/4 of current supply) will close during next two decades
- 3) Meet growth in demand that efficiency programs can't prevent

*Wind energy represents at least 3/4 of the region's medium-term renewable energy potential*

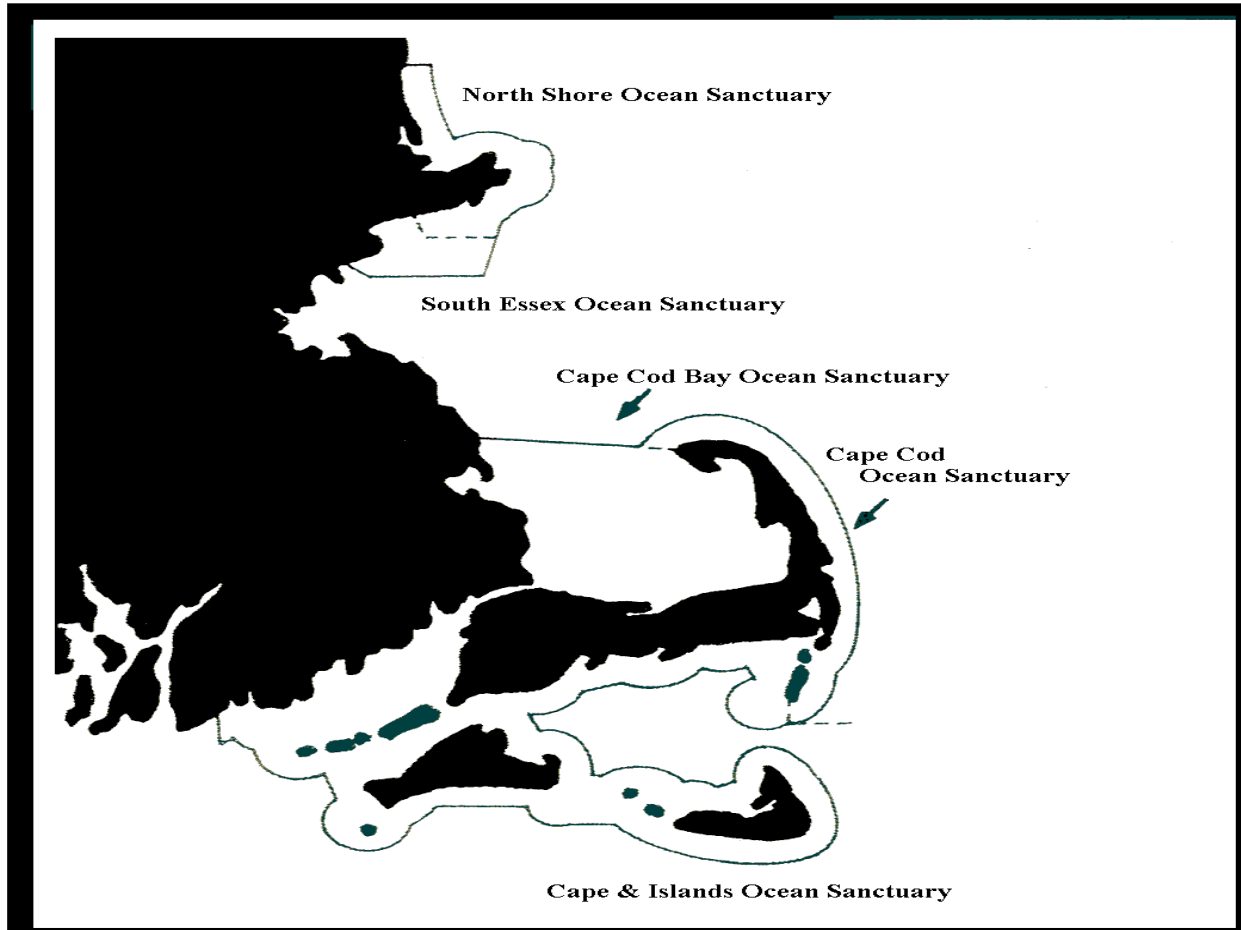


# Massachusetts Ocean Sanctuaries Act

- Five sanctuaries
- Cover most state coastal waters, from low water line to 3-mile boundary (inc. some river areas)
- “[P]rotected from any exploitation, development, or activity that would significantly alter or otherwise endanger the ecology or the appearance of the ocean, the seabed, or subsoil thereof, or the Cape Cod National Seashore”
- M.G.L. ch. 132A, §§ 12A-16, 18



# Massachusetts Ocean Sanctuaries





# Massachusetts Ocean Sanctuaries Act

- Prohibited activities include, except as otherwise provided,
  - “Building of any structure on the seabed or under the subsoil”
  - “Construction or operation of offshore or floating electric generating stations”



# Massachusetts Ocean Sanctuaries Act

- Permitted activities include,
  - except in Cape Cod Ocean Sanctuary,
    - Construction, operation, and maintenance of all activities, uses and facilities associated with generation, transmission, and distribution of electricity; laying of DTE-approved cables
    - Projects
      - Authorized under Chapter 91 and
      - Determined to be of public necessity and convenience (six-factor standard)



# Massachusetts Chapter 91

- Implements “public trust doctrine”
- Protects public rights in waterways and tidelands by ensuring their utilization for water-dependent activities or for other public purposes
- Tidelands = lands presently or formerly submerged beneath waterways, from high water line to state boundary (includes filled tidelands)



# Chapter 91 -- “Basic Requirements”

- Structure or fill must be for an eligible use
  - Below high-water mark, must be a water-dependent use – one that requires “direct access to or location in tidal or inland waters”
- Project must comply with
  - Zoning and any municipal harbor plan
  - State environmental laws
  - Standards protecting water-related public rights and water-dependent uses



# Chapter 91 -- “Proper Public Purpose Requirement”

- Project must serve “a proper public purpose which provides greater benefit than detriment to the rights of the public in [tidelands]”
  - Standard presumed met if project is for a water-dependent use
  - Below high-water mark, only water-dependent uses meet “eligible use” basic requirement



# Maine Submerged Lands Act

- Complements/implements public trust doctrine
- Administered by Department of Conservation's Bureau of Public Lands (BPL)
- Non-water dependent uses not favored, but not prohibited
- Building structures requires lease or easement and payment of rent
- BPL may prohibit unreasonable interference with navigation, fishing, other existing marine uses



# Marine Protected Areas (MPAs)

- MPAs = Massachusetts ocean sanctuaries, national parks and wildlife refuges, Stellwagen Bank National Marine Sanctuary, etc.
- In areas of high conservation value, habitat and biodiversity should be given *full long-term protection from all human disturbances and extractive activities* – no such MPAs today
- State, federal law authorize heightened protection
- Environmental review process for wind energy projects must ensure they are not built in areas deserving heightened protection



# Horns Rev Wind Farm, off Denmark in the North Sea





# Horns Rev



*1.72 % of the total annual, Danish electricity consumption is to be covered by the production in the North Sea.*



*Sunset at Horns Rev.*





# Middelgrunden Wind Co-operative, Copenhagen





# Why Wind Energy, and Why Offshore?

- Renewable energy is a critical part of regional power system clean-up and climate strategy
- Wind represents at least 3/4 of medium-term commercially viable renewable energy potential
- Wind resource lies only in mountains and offshore
- Offshore wind energy is distinguished by
  - Stronger, steadier winds
  - Proximity to power demand
  - Space for large turbine arrays
  - Economies of scale that make larger projects more competitive in today's market-based power system