

December 11, 2003

**To: Environmental Affairs Secretary Ellen Roy-Herzfelder**

The Commonwealth of Massachusetts  
Executive Office of Environmental Affairs  
251 Causeway Street, Suite 800  
Boston, MA 02114-2136

**Subject: Public Hearing on the Ocean Task Force Draft Report**

Dear Secretary Roy-Herzfelder,

Although this Ocean Task Force was formed on orders from Gov. Romney regarding state waters, it probably would not be in existence if the wind project in the federal waters of Nantucket Sound had not been proposed.

To that end I would like to focus my comments on the impact the draft principles may have, not only on state waters, but as an attempted extension to federal waters as well, especially in regard to renewable energy projects.

It is apparent that most principles of the Task Force are intended to either impose new taxes and fees or restrict activities on the state's public waters. While some projects, yet unknown, may warrant additional restrictions and fees, certainly renewable energy projects do not. And I use the term "renewable energy" as defined in the state mandated "Renewable Energy Portfolio Standard," namely: ocean, wind, and solar projects. After all, the reason for the state's RPS is not only to encourage, but to mandate, renewable energy in our suppliers' portfolios. And indeed, the concept of renewable and sustainable energy for the nation is the reason for the federal production tax credit for wind energy production.

As proposed, I believe the draft principles will add another layer of bureaucratic delay and undefined taxes as well as intractable conclusions on visual, cultural (whatever that means), and aesthetic attributes of potential offshore renewable energy projects. After all, who is to say whose ocean view is more valuable or beautiful than any other ocean view? These principles cast a cloud of doubt and unknown circumstances over beneficial renewable energy projects to the extent of discouraging or prohibiting such development in this state.

Indeed, rather than focus on fees and perceived negative impacts, the ocean act principles should weigh the benefits of renewable energy on offsetting fossil energy with respect to public health, air and water quality, the importation of fossil fuel, greenhouse gas accumulation, and the diversity of a free energy source such as wind, solar, and ocean waves and tides. And where the balance is found to be in

favor of the public good, any new prohibitions and taxes on such projects should be negated so long as current permitting agencies approve the project.

In conclusion, I would like to remind you of the valiant efforts of Gov. Romney in protecting the health of the citizens of Salem from the pollution of their local power plant. There he evoked the Harvard study which he said caused 30 premature deaths each year due to the noxious emissions from the Salem Harbor fossil fueled power plant.

In the case of the wind farm on Nantucket Sound, the impact on human health, from a linear extrapolation of the Harvard study, shows that the reduced production from fossil fueled eastern Massachusetts power plants would result in achieving a mortality offset of approximately 15 fewer deaths per year. This conclusion is affirmed by Dr. Jonathan Levy, one of the two authors of the Harvard study (letter attached, on reverse of the Fact Sheet). This health impact also includes the reduction of thousands of asthma attacks and other respiratory ill effects as noted on the attached Fact Sheet. Note, the monetary valuation of these savings is some \$53 million dollars every year. And importantly, the reduction of local power plant emissions would certainly ameliorate the air quality of the Cape, currently the worst in the state and 50% worse than the air quality in Boston.

I would therefore admonish the task force to either eliminate renewable energy projects from the listed activities or at least insure that the benefits, both monetary and intangible, be balanced against perceived negative impacts.

For your information and consideration, a resolution of support for the Wind Farm in Nantucket Sound is also attached which affirms the enormous societal benefits and is endorsed by HealthLink of Salem, Clean Water Action of Boston, and Cape Clean Air.

Sincerely,

Charles W. Kleekamp, P.E. Ret.  
Information Director of Clean Power Now, and  
Vice President, Cape Clean Air



## Clean Power Now

### Windfarm Fact Sheet - Benefits of the Windfarm on Health

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A significant benefit of the wind farm frequently overlooked is the impact on human health. Since electricity can't be stored on the transmission grid, it is a fact that this wind power will reduce a like amount of energy from fossil fuel generating plants. With less fuel burned, the polluting emissions will be diminished, eliminating some 1,400 tons of nitrogen oxides, 4,600 tons of sulfur oxides<sup>1</sup> and 360 tons of particulate matter<sup>2</sup>.

These pollutant concentrations are greatest within five to twenty miles downwind of a local source like the Canal Plant and are the root cause of health effects recognized in recent studies by the Harvard School of Public Health<sup>3</sup>. The reduction of these pollutants in the New England region will statistically eliminate 12 to 15 premature deaths every year, some 200 emergency room visits, 5,000 asthma attacks, and 35,000 cases of daily upper respiratory symptoms and other related afflictions according to an extrapolation of data in the Harvard Report<sup>4</sup>.

Furthermore, the decrease of nitrogen oxides will reduce unhealthy ozone concentrations thus improving the air quality of Barnstable County, currently declared by the American Lung Association as the worst in the state<sup>5</sup>.

Compiled by Charles Kleekamp, P.E., Ret.

Dr. Levy letter on reverse>

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<sup>1</sup> Displaced pollutant calculations based on "2000 NEPOOL Marginal Emission Rate Analysis," by ISO New England, April 9, 2002, Calculations from Table ES1, p. 1. Wind farm yearly energy production is 1.5 million MWh based on an average power generation of 170 MW.

<sup>2</sup> Particulate matter reduction based wind farm offset of Canal plant emissions in 1998 of 1,450 tons/yr times the offset ratio of 0.25 = 362 tons/yr. The offset ratio is the ratio of average yearly wind power (1.5 million MWh) to the three year average of the Canal energy output (6 million MWh) = 0.25. Canal data from a petition before the MA Energy Facilities Siting Board of October 1999, Figure 1-9.

<sup>3</sup> "Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants," Dr. Jonathan Levy and Dr. John D. Spengler, dated May, 2000, p.4.

<sup>4</sup> Health impact offsets are calculated by the ratio of power delivered to the New England grid from the wind farm average contribution (1.5 million MWh) (as if it were operating in 1998) compared to the average combination of those fossil fueled power plants (13 million MWh). In a letter "To whom it may concern," dated December 4, 2002, Professor Levy, one of the Harvard study authors, states "his [Kleekamp's] calculations are reasonable... and his framework is appropriate."

<sup>5</sup> "F" For Air Quality," Cape Cod Times, May 2, 2003, and "The Air We Breathe," Cape Cod Times, May 15, 2003. Data from the air monitor in Truro as reported in the American Lung Association survey of 2003, [www.lungusa.com](http://www.lungusa.com).

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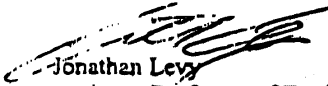
To whom it may concern:

I have reviewed a document provided to me by Charles Kleekamp, involving the extrapolation of findings from our power plant health impact assessments for the Salem Harbor and Brayton Point power plants. His calculations essentially involve a linear extrapolation from our health impact estimates, explicitly assuming that a non-polluting renewable energy source has offset approximately 1.5 million MWh (via a 170 MW source running continuously) from either the Salem Harbor or Brayton Point power plant. While I cannot judge how the electricity sector would be influenced by this hypothetical energy source, his calculations are reasonable given this assumption and information from our report titled "Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants." In general, since incremental emission reductions would provide incremental public health benefits, his framework is appropriate.

It should be noted that our estimates for health impacts changed slightly in a more updated publication (Levy JJ, Spengler JD. Modeling the benefits of power plant emission controls in Massachusetts. *J Air Waste Manage Assoc* 52: 5-18 (2002)). In this analysis underlying this paper, we estimate approximately 80 deaths per year associated with Brayton Point given net generation of 7,660,738 MWh and 30 deaths per year associated with Salem Harbor given net generation of 3,222,262 MWh. Applying Mr. Kleekamp's approach to our revised estimates yields a mortality offset of approximately 15 fewer deaths per year in both cases.

Please let me know if you have any questions or require additional information.

Sincerely,

  
Jonathan LevyAssistant Professor of Environmental Health and Risk Assessment  
Harvard School of Public Health



## **Resolution of Support for the Wind Farm in Nantucket Sound**

- 1. Whereas,** a proposed wind farm in Nantucket Sound by Cape Wind Associates will bring enormous societal and environmental benefits from a most benign source of electrical energy, and
- 2. Whereas,** the proposed wind farm consisting of 130 turbines is projected to deliver 170 megawatts of average power and approximately 420 megawatts of peak power [1] which will supply three-quarters of the power consumed on the Cape and Islands [2], and
- 3. Whereas,** that equivalent amount of energy displaced by backing off fossil fueled generators will eliminate criteria pollutants in the New England region consisting of approximately 360 tons of particulate matter [3], 4,600 tons of sulfur oxides, 1,400 tons of nitrogen oxides, and an astounding 1,000,000 tons of carbon [4], for every year of operation, and
- 4. Whereas,** the reduction of criteria pollutants offset by wind power will statistically eliminate in the New England region approximately 12 to 15 premature deaths every year, 20 cases of bronchitis, 200 emergency room visits, 5,000 asthma attacks, and 35,000 cases of daily upper respiratory symptoms and other related afflictions according to an extrapolation of data in a recent Harvard School of Public Health report on power plant emissions [5], and
- 5. Whereas,** the monetary value of these health effect reductions using the EPA valuation of a premature death and associated health care cost data from the Harvard report amount to savings of approximately \$53 million dollars every year [6], and
- 6. Whereas,** the dramatic reduction of the offset in carbon dioxide will take a positive step in reducing climate change and the impact of rising sea levels and dramatic changes in global weather patterns, and
- 7. Whereas,** the reduction in nitrogen oxides will abate the ozone air quality indicator for Barnstable County, currently the worst county in the commonwealth [7], as well as in the Cape Cod National Seashore which is among the worst parks in the nation for ozone and sulfate air quality indicators [8], and in the region as a whole thus improving health, recreation, and visibility, and
- 8. Whereas,** that amount of displaced energy, as if produced from oil fueled generators, will eliminate the import of approximately 95 million gallons (2.25 million barrels) of heavy #6 fuel oil every year [9], and
- 9. Whereas,** that equivalent oil cost would reduce the balance of payments from the United States by approximately 60 million dollars every year [10], and
- 10. Whereas,** the energy independence achieved from imported oil would be a step in reducing the dependence on foreign supplies of oil and the associated political ramifications, and
- 11. Whereas,** the reduction in fuel oil shipped by barge and tanker for power plants would decrease the likelihood of devastating oil spills and related bird kill [11], and
- 12. Whereas,** the resulting diversification of energy sources, particularly from fossil and nuclear fuels, would provide a more robust regional capability to provide electrical energy under any natural or terrorist circumstance, and

13. Whereas, since the operation and maintenance costs of the wind farm are stable, it would provide long-term stability in electric rates to the Cape and Islands consumers, and

14. Whereas, since the fuel cost of wind energy will always be zero, the resulting price of electrical energy from this source will bump highest bidders from the accepted hourly clearing price in the ISO New England market thereby lowering the aggregate cost to all consumers [12], and

15. Whereas, the reliability and acceptability of large ocean wind farms has been demonstrated by many viable projects in Europe, and the implementation of an offshore wind farm in Nantucket Sound will set a precedent and provide a model for additional development of ocean based wind power in the United States, and

16. Whereas, the Nantucket Sound wind farm will provide over 150 permanent jobs including 50 local maintenance and operations jobs in Barnstable County with an average salary of over \$50K per year, and the manufacturing and construction of the wind farm will generate and estimated 600 to 1,000 jobs in the region [13], and

17. Whereas, alternative terrestrial and offshore sites throughout New England have been screened for a utility size wind farm by the US Army Corps of Engineers resulting in a preliminary finding, based on technical criteria of wind resource, available area, water depth, wave height, and proximity to transmission facilities, that Nantucket Sound is the most technically viable location [14], and

18. Whereas, the wind farm will subtend an area of 24 square miles, the actual area imposed for the monopole structures themselves will occupy less than one acre of sea surface allowing unlimited use of the space between and among the monopoles [15], and

19. Whereas, Cape Wind Associates agrees to be subject to any future applicable federal government lease regulations and fees imposed for offshore wind projects [16], and

20. Whereas, Cape Wind Associates is responsible for the costs associated with the development, construction and decommissioning of the project and electric consumers will be not bear the risk of these costs [17], and

21. Whereas, technical and environmental challenges and risks associated with the wind farm including avian, fisheries, and benthic impacts, will be carefully studied by comprehensive environmental impact statements and permits required by local, state, and federal agencies [18] to evaluate the appropriateness of the project.

**NOW, THEREFORE, BE IT RECOGNIZED,** that the following organizations support the Cape Wind Project pending successful completion of all environmental reviews and so that local impacts are thoroughly assessed.

#### **Signatories**

1. Cape Clean Air, Sandwich, MA
2. HealthLink, Greater Salem, MA
3. Clean Water Action, Boston, MA
4. Brown University Environmental Action Network, Providence, RI

## Endnote References and Calculations

[1] "Expanded Environmental Notification Form (EENF), and Combined Cape Cod Commission Development of Regional Impact Review," Cape Wind Associates, LLC, November 15, 2001, p. 1-1. For Secretary Robert Durand, Executive Office of Environmental Affairs

[2] Salamone, Charles (Director, System Planning, NStar). "Competitive Wholesale Markets & the Cape Region," MTC Stakeholder Meeting, NStar presentation, Hyannis, MA, October 31, 2002.

According to Salamone, the year around average consumption of power the Cape and Islands is 230 MW and  $170/230 = 0.74$  or 74%. The peak summer load is 446 MW ("Cape & Islands Electric Supply," p. 3, 4)

[3] "Figure 1-9," Canal Plant Petition to the MA Energy Facilities Sitting Board, October 1999.

Note: Particulate matter reduction based wind farm offset of Canal plant emissions in 1998 of 1,450 tons/yr times the offset ratio of 0.25 = 362 tons/yr. The offset ratio is the ratio of average yearly wind power (1.5 million MWh) to the three year average of the Canal energy output (6 million MWh) = 0.25.

[4] Displaced pollutant calculations based on ISO New England. "2000 NEPOOL Marginal Emission Rate Analysis," April 9, 2002, Table ES1, p. 1.

Note, power from the Pilgrim nuclear plant is unlikely to come to the Cape and the Islands according to comments from Commissioner David O'Connor, Massachusetts Division of Energy Resources, during a presentation at the MTC Stakeholder Meeting in Hyannis on October 31, 2002. Therefore it is unlikely that the Pilgrim plant will be backed off with the addition of power from the wind farm. The remaining power plants in the South-East region (a net exporter of power) are fossil fueled and will likely be the ones backed off particularly due to transmission line capacity limitations going out of the region.

[5] Levy, Jonathan and John D. Spengler. "Estimated Public health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants," Harvard University, Cambridge, MA. May, 2000.

Health impact offsets are calculated by the ratio of power delivered to the New England grid from the wind farm average contribution (1.5 million MWh) (as if it were operating in 1998) compared to the average combination of those fossil fueled power plants (13 million MWh). In a letter "To whom it may concern," dated December 4, 2002, Professor Levy, one of the Harvard study authors, states "his [Kleekamp's] calculations are reasonable... and his framework is appropriate." Note, these sulfur and nitrogen oxide pollutants form fine particulate matter (PM2.5) in the atmosphere with concentrations greatest within five to twenty miles downwind of the source (not from the Midwest) and are the central cause of the health effects noted in the Harvard Study.

It has been argued that wind farm power may not displace power from just the named Salem Harbor and Brayton Point plants. However, other coal and oil fired power plants in New England would have similar emissions for the same amount of power displaced. In fact, since the Salem and Brayton plants are on the east coast of Massachusetts much of polluting emissions of SO2 and particulate matter are swept out to sea by prevailing westerly winds. Other power plants located inland will deposit even more of their emissions on the land mass since primary pollutant concentrations at ground level are greatest close to the source (within 5 miles for SO2 and PM10) and peak approximately 20 miles downwind for secondary particles (PM2.5). Hence, the health benefits will be very similar in any case.

[6] "EPA Drops EPA Age Based Cost Studies," New York Times, May 8, 2003.

The current value of a statistical human life used by the EPA in the Bush Administration for evaluating savings from cleaner air by offsetting premature deaths is \$3.7 million. Previously (1997), the value of a human life from an EPA benefit-cost analysis that pooled contingent valuation and wage-risk studies was \$6.1M. The devalued cost of a human life is used in this document is (12 premature deaths times \$3.7 = \$44.4 million). The estimated costs of emergency room visits, bronchitis, asthma attacks, and respiratory symptom are estimated to be over \$8 M per year (Levy and Spengler, 2003. p. 23).

- [7] "F For Air Quality," Cape Cod Times, May 2, 2003.  
 "The Air We Breathe," Cape Cod Times, May 15, 2003.  
 American Lung Association Survey of 2003. [www.lungusa.com](http://www.lungusa.com)

Air quality data in these reports from the Massachusetts Department of Environmental Protection air monitoring station in Truro

- [8] "National Seashore Choked by Midwest Smog," Cape Cod Times, October 10, 2002. p. B1.

[9] The heat rate for an oil fired power plant is about 9 mmBtu/MWh. The heat energy in a barrel of #6 oil is about 6 mmBtu/Bbl. Therefore to produce 1.5 million MWh of energy (the yearly equivalent wind power) would require:  $(9 \text{ mmBtu/MWh} \times 1.5 \text{ million MWh}) / 6 \text{ mmBtu/Bbl} = 2.25 \text{ million barrels}$  or 95 million gallons. Note: one barrel contains 42 gallons.

- [10] New York Times, May 29, 2003.

Crude oil contracts on the world market over the last 18 months varied from \$20 to \$38 a barrel. Note: for this illustration, a value of \$28/Bbl was used.

- [11] "Mirant's Credibility," Cape Cod Times, June 26, 2003.  
 "Fragile plovers stress rescuers," Cape Cod Times, May 1, 2003.  
 "Tug crew lagged in response to calls," Cape Cod Times, June 5, 2003.

On April 27, 2003, a Bouchard oil barge carrying No. 6 bunker C fuel destined for the Mirant Electric Power Plant on the Cape Cod Canal struck a submerged object ripping open the hull and spilling an estimated 22,000 to 55,000 gallons of oil into Buzzards Bay. The spill closed shellfish beds, killed over 400 birds including terns, loons, and piping plovers (a threatened species) and fouled shorelines. This spill is the most recent in a long history of tanker and barge and oil spills in waters off Cape Cod.

- [12] O'Connor, David (Commissioner, Mass. Division of Energy Resources).  
 "Competitive Wholesale Markets & the Cape Region," MTC Stakeholder Meeting,  
 NStar presentation, Hyannis, MA, Oct. 31, 2002, p. 12. Comments from Commissioner O'Connor.

- [13] Study by Global Insight Inc., Lexington MA, April 18, 2003.

- [14] Adams, Karen (US Army Corps of Engineers). MTC Stakeholder Meeting, Hyannis, MA, March 12, 2002.

- [15] "Wind Turbine Proposal Cut by 40," Cape Cod Times, January 22, 2003.  
 Area of wind farm quoted. The diameter of the monopoles is said to be 16 feet. Thus the sea surface area occupied by one monopole is  $\pi \times 8^2 = 200$  square feet, then multiplied by 130 poles = 26,000 square feet or 0.57 acre. The underwater base of the monopole will have a scouring pad to prevent erosion from ocean currents.

- [16] Gordon, Jim (President, Cape Wind Associates).

- [17] Gordon, Jim (President, Cape Wind Associates). A decommissioning plan will be put in place so at the end of the useful life of the project, the turbines will be removed.

- [18] Adams, Karen (US Army Corps of Engineers). "Draft Scope of Work for the Environmental Impact Statement," MTC Stakeholder Meeting, Hyannis, MA, October 10, 2002, 7 pages.