Statement at public hearing held on December 7, 2004 at Mattacheese Middle School by the U.S. Army Corps of Engineers and the Massachusetts Environmental Policy Act Office on a proposal by Cape Wind Associates to build 130 wind turbines in Nantucket Sound.

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Public Health Impacts and Economic Costs from Power Plant Emissions

The Army Corps Draft Environmental Impact Statement (DEIS) concludes that the Cape Wind Project could have a "cumulative beneficial effect on public health, and result in a related reduction in the costs of adverse health impacts from existing power plant emissions…The yearly monetary savings associated with these reductions in adverse public health impacts is estimated at approximately $53 million dollars."

This estimation is based on a flawed extrapolation from the findings of a Harvard Public Health study, which focused on improving emissions at two of the nation's worst polluting power stations. ***We believe this extrapolated estimate largely overstates the annual monetary savings; we find the savings to be in the range of $7-$20 million and declining over time.*** The difference arises from the assumption, made originally by Cape Clean Air and reproduced by the Army Corps, that the wind park will offset production at either the Salem Harbor or Brayton Point power stations. This assumption, which we believe to be erroneous, is not supported by any evidence.

The Army Corps' Estimates

Below is a reproduction of Army Corps' Table 5.16-4. The table reports the estimated amount of pollutant reductions attributable to the wind park, assuming the wind park output offset production of a) the marginal producer in New England, based on an ISO-NE marginal emissions analysis, or b) each of the selected power plants on a one-for-one basis.

Table 5.16-4 – Pollutant Emission Reductions using Wind Park Average Contributions (Tons/Year)

Reference	CO2	SO2	NOX	PM	CO	VOC
ISO NE Marginal Emission Rates	1,108,039	4,606	1,415	N/A	N/A	N/A
Salem Harbor	N/A	9,800	2,600	11	N/A	N/A
Brayton Point	N/A	11,200	2,460	68	N/A	N/A
Canal Plant	1,426,886	8,098	2,152	353	1,396	44
Average of Salem, Brayton, Canal	1,426,886	9,699	2,404	177	1,396	44
Number used in Analysis	**1,108,039**	**4,606**	**1,415**	**177**	**1,396**	**44**

Note that the marginal producer in New England is burning much cleaner than any of the selected power plants. This point is made clearer by observing the implicit emission rates of each source compared against the emission rate of the marginal producer in New England, in 2000 and 2002. Table 1 below illustrates these emission rates.

Table 1. Implicit Emission Rates (lbs/MWh)

Emission Rates	CO2	SO2	NOX	PM	CO	VOC
ISO-NE Marginal Emissions, 2000	1,488.1	6.2	1.9	N/A	N/A	N/A
ISO-NE Marginal Emission Rates, 2002	1,337.8	3.3	1.1	N/A	N/A	N/A
Salem Harbor	N/A	13.2	3.5	0.0	N/A	N/A
Brayton Point	N/A	15.0	3.3	0.1	N/A	N/A
Canal Plant	1,916.3	10.9	2.9	0.5	1.9	0.1

As the table above illustrates, the 2000 ISO-NE marginal emission rates are dramatically lower than the emission rates at the select power plants. Lower still are the 2002 ISO-NE marginal emission rates which, although available since December 2003, have not been incorporated into the Corps' analysis. *As the data illustrate, emission rates have fallen considerable over the past few years and will likely continue to fall as older power plants are upgraded and new cleaner plants come online.*

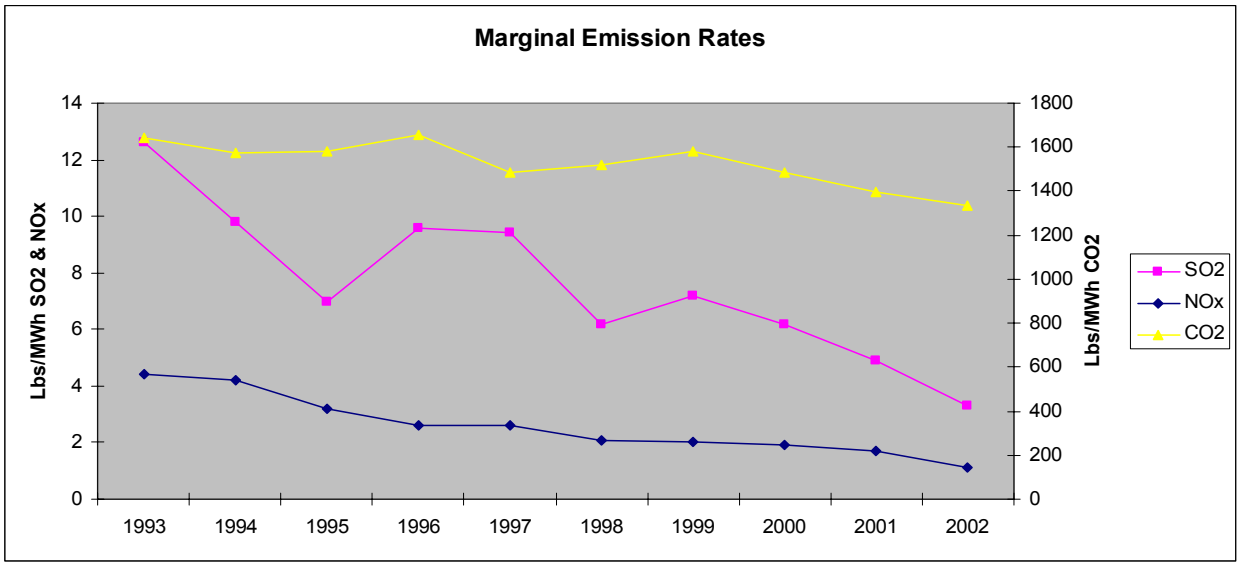
Estimating Health Effect Offsets and Monetary Values

Although the Army Corps reports in Table 5.16-4 that the numbers used in the analysis were taken from the ISO-NE marginal emission rates, ***when calculating the health effects and monetary values, these estimates, the accurate ones, are abandoned***. Instead, the Army Corps' methodology is to 1) assume a one-for-one offset at either Salem Harbor or Brayton Point, 2) average the emission reductions between the two, and 3) attach a monetary value based on this average. The result of this estimation is an annual savings of $53,118,274.

We object to this methodology and conclusion for the following reasons:

1. Health effects and monetary value estimates are derived by assuming that the wind park's output will offset either Salem Harbor or Brayton Point power stations – two of the region's worst polluters.
    a. This assumption is not supported by any evidence and is in fact flawed. The Army Corps should at least have provided a comment from the regional grid manager as to whether this is a reasonable assumption.
    b. An examination of the emission rates at the region's marginal producers (those who would likely be offset by Cape Wind) illustrates that this assumption is incorrect. The emission rates from the marginal producers, the plants that would be offset by Cape Wind Energy, are 2-3 times lower than both Salem and Brayton Point.
2. Where the ISO-NE marginal emission rates are used, the Army Corps relies on outdated information.
    a. The ISO-NE numbers are based on 2000 data. Since this time, cleaner power sources have come online and marginal emission rates have continued their considerable downward trend.
    b. Updated numbers were available in January 2003 and again in December 2003. Figure 1 shows the continued downward trend in emissions as cleaner plants come online and older plants are retrofitted.

Figure 1: Marginal Emission Rates, 1993-2002



Proposed Methodology

Rather than rest an entire analysis on the assumption that Brayton Point and Salem will be offset, it is possible to use estimates of public health impacts per unit of emission ($/ton) derived by the Harvard Public Health studies. This allows for a monetary savings estimate to be derived using a reliable, published estimate yet based on the ISO-NE Marginal Emission analysis, a reliable simulation of the regional energy market.

Table 2 below illustrates the public health costs per unit of emission derived in "Development of a New Damage Function Model for Power Plants: Methodology and Applications" by Jonathan Levy et al. of the Harvard School of Public Health. The values have been updated to 2004 dollars using the Bureau of Labor Statistics Consumer Price Index.

Table 2. Public Health Costs per Unit Emission

Pollutant	$, 2004	$, 1997
PM10	14,273	12,000
SO2	940	790
NO2	916	770
CO2	4.04	3.40

These values per unit of pollutant can be used to estimate the savings attributable to the wind park's production. The savings are summarized in Table 3 below. As the table illustrates, if the wind park were to offset production one-for-one at the Canal Plant, for instance, the health savings would be highest at roughly $20 million. If, however, the wind park offsets the marginal producer in the grid, the savings are the lowest, at $7 million. Both estimates are well below the Army Corps' estimate of $53 million. Note: the absence of values for CO and VOC are likely to have very little significance. The vast majority of health impacts are associated with SO2, NOx and PM.

Table 3. Estimated Annual Monetary Savings, by pollutant

Reference	CO2	SO2	NOX	PM	CO	VOC	Total Savings
ISO-NE Marginal Emission Rates, 2000	4,476,478	4,327,936	1,295,914	N/A	N/A	N/A	10,100,327
ISO-NE Marginal Emission Rates, 2002	4,024,349	2,308,840	750,128	N/A	N/A	N/A	7,083,317
Salem Harbor	N/A	9,208,374	2,381,184	157,002	N/A	N/A	11,746,560
Brayton Point	N/A	10,523,856	2,252,966	970,557	N/A	N/A	13,747,380
Canal Plant	5,764,619	7,609,124	1,970,888	5,038,334	N/A	N/A	20,382,965
Average of Salem, Brayton, Canal	5,764,619	9,113,785	2,201,679	2,055,298	N/A	N/A	19,135,381
Number used in Analysis	4,476,478	4,327,936	1,295,914	2,055,298	N/A	N/A	12,155,626

The large difference in our estimate for savings from Brayton and Salem derives from the Corps' estimate of the value of a statistical life (to value premature deaths). They have used a value of $3.7 million which is the amount

reportedly used by the Environmental Protection Agency. However, attributing this entire amount to a premature death caused by air pollution may overstate the impact. As Levy et al. points out:

> "Since air pollution mortality might disproportionately occur in elder populations or individuals with preexisting conditions, the standard wage-risk estimates may not be appropriate. Given that the loss of life-years may be less than the population average, we use the lower value per premature mortality. We estimate a value of $300,000 per statistical death, based on the value of statistical life-year approach in the EPA benefit-cost analysis and a recent assumption about years of life lost per acute mortality death."[1]

One final note should be made regarding emission reductions. As Figure 1 above illustrates, marginal emission rates are trending downward. The value of the wind park's offsets will fall as emission rates decline further, making these estimates at the peak of the wind park's public health benefits.

Conclusion

While the assumptions and analysis of public health benefits attributable to the wind park seemingly rest on rigorous scientific studies, the overly simplistic extrapolation dramatically overstates the public benefits. Accurately quantifying these benefits is important in the context of a true cost-benefit test to which this project should be subjected, given the substantial public investment required for this project ($382 million by our estimation). The public deserves a better return on its massive investment and a better analysis of its benefits and costs.

[1] Jonathan Levy et al., "Development of a New Damage Function Model for Power Plants: Methodology and Applications," *Environmental Science & Technology*, Vol. 33, No. 24, 1999: page: 4369.