TAB 7

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Petition of BNE Energy Inc. for a Declaratory Ruling for the Location, Construction and Operation of a 3.2 MW Wind Renewable Generating Project on New Haven Road in Prospect, Connecticut

Docket/Petition No. 980

February 16, 2011

Prefiled Testimony of David Pressman

I Introduction

Q. Please state your name and occupation.

A. My name is David Pressman. I am an Analyst at Energy Ventures Analysis in Arlington, VA.

Q: On whose behalf are you submitting testimony?

A: I am submitting testimony on behalf of Save Prospect.

Q: Please describe the assignment you were given for this proceeding.

A: I was asked to review the BNE's Prospect Wind application. I was asked to provide an independent opinion on the proposed site's wind resources and its claims of power output.

Q: Please summarize your findings.

A: My testimony covers four areas. My major findings discussed in my testimony are:

1) Connecticut utilities are interested in procuring the lowest cost qualifying renewable resources to meet their Renewable Portfolio requirements that can come from a broad region stretching from Maryland to Maine. The competitiveness of wind power as a renewable electricity source is heavily influenced by continuing governmental support (grants, production tax credits, state RPS, tax incentives) to offset their higher production costs and the wind project's capacity factor (since the vast majority of wind production costs are

fixed capital and operating costs). Therefore a wind facility's projected capacity factor should be an important factor in the siting Board's evaluation.

2) While BNE provided some summary data from their wind monitoring tower, no data was provided to develop an independent estimate of the project power output. Nor did the application provide documentation for how its 10 percent loss and power output estimates were developed. Without these data to develop an independent estimate or documentation on how the data was manipulated, we are left to making a comparison between historical performance of existing operating wind projects to the BNE's 30 percent capacity factor performance for Prospect Wind estimate. Given that the existing wind projects are sited along much higher mountain ridges with better wind resources, there appears to be little support for BNE's assumed 30% capacity factor.

3) BNE's Prospect application makes no discussion of project capital, operating and maintenance costs, and what impact these costs will have on consumers. Therefore, the Siting Council has no cost or pricing information to determine if this project represents a competitive alternative for Connecticut utilities or other utilities seeking renewable energy.

4) Better options likely exist in Connecticut's effort to develop its renewable resources to meet its Class I Renewable Portfolio Standards (RPS). Other locations especially along mountain ridges in New England offer better wind conditions. Many other proposed wind projects are able to offer better economies of scale. Finally, biomass projects with their much higher capacity factors and account for a much larger market share of the regional renewable market may also provide a more competitive resource.

II BNE Energy's Power Output Projections

Q: Why is Capacity Factor so important in wind projects?

A: Capacity factor indicates how efficiently a unit is being operated. It can be defined as Actual project output/Maximum Theoretical project output, or what percentage of the time is the unit producing power at full usage. Nuclear plants generally operate with a capacity factor in the 90-95% range, while coal and biomass plants

generally operate in the 55-80% range. Natural gas units are flexible and can operate anywhere from the 10-80% range. These power units can be ramped up and down to compensate for fluctuations in electricity demand in a given day and hour.

Wind, like solar and some other renewables, is an intermittent resource, and cannot be dispatched depending on need. Wind's capacity factor is highly variable depending on location and wind resources, but generally sits in the 20-32% range, with some projects in high wind areas (parts of the Midwest, offshore) reaching the 34-38% range. This slight difference in output is crucial, because the more power a unit produces, the cheaper the unit becomes to operate and the cost of producing the power decreases. This efficiency is reflected in lower electricity bills for consumers (See Exhibit DHP-1).

Q: BNE assumes a 10% deduction after losses in its capacity factor projections. Is this number accurate?

A: Wind projects often encounter generation losses due to turbine maintenance, transmission losses, inoperable wind conditions, blade icing and a number of other factors. BNE provides no documentation as to how they developed their 10% figure. Given Prospect's Northeast location and exposure to cold weather, it is possible generation losses were closer to 15-20%. This reduced capacity factor would have an enormous impact on project output and profitability.

Q: In their application, BNE assumes the 3.2 MW project will operate at a 30% capacity factor, generating approximately 8,410 MWh of renewable energy annually. Is this assumption realistic when compared to historical power output at other New England wind projects?

A: In their filings, BNE has not provided any information as to how they developed their assumed 30% capacity factor. In the Volume 3 of their assessment, BNE states that after nearly 15 months of wind speed testing, the report calculated capacity factors at 20-35% at 80-meter hub height. At 60 meters, the mean wind speed over the testing period was 5.79 and 5.81 meters. Extrapolated to 80 meters, this equals 6.5 m/s, and at 100 meters, 7.1 m/s.

Q: BNE claims in its application that the Prospect site "is ideally suited for a wind generation project due to its elevation, orientation and topographical characteristics." How do the wind resources of the proposed Prospect site compare to other potential wind sites in Connecticut and elsewhere around New England?

A: Not surprisingly, no wind projects have been erected in Connecticut since the state has relatively poor resources compared to the rest of New England. The best wind resource sites are generally located in northern New England, especially New Hampshire and Maine. According to the National Renewable Energy Laboratory (NREL), Connecticut wind speeds generally average 4-6 meters/second at 80m (see Exhibit DHP-2). This includes the Prospect site.

The Department of Energy (DOE) considers 7 m/s as the minimum avg. wind speed to warrant wind project development. As detailed in Exhibit DHP-2, DOE classifies Connecticut's inland wind speeds as Class I-II, or "poor" or "marginal." Along Connecticut's southern coast, in the area between Stratford and the Massachusetts border, some areas have avg. wind speeds that average 6-7 m/s, which would be classified as "fair." (Exhibit DHP-3). In Maine, as a means of comparison, there are numerous on-shore sites with average wind speeds of 6-7.5 m/s (Exhibit DHP-4).

Off-shore wind speeds off the New England coast are consistently higher than on-shore. Off Connecticut's southern coast, the offshore winds average between 7-8 m/s, or what would be classified as Class III-V, or "Fair" to "Excellent." While it is difficult to accurately specific project output based on year-long testing, Connecticut's average. wind speeds are marginal.

Finally, for the relatively small Prospect Wind project site, the application admits that the turbines had to be located much closer together, resulting in greater turbulence losses. No discussion is provided on how these greater turbulence losses were accounted for.

Q: How does Prospect's assumed 30% capacity factor compare to other existing wind projects in New England?

A: A review of historical capacity factors of other Northeast wind projects between 1-60 MW suggests that a 30% capacity factor would be considered high even for projects located in areas with superior wind resources. Many of the projects provided below are located on high ridgelines, on the coast or other areas with wind resources superior to Prospect (often Class III-IV). As part of the Connecticut RPS, states can purchase qualifying renewable energy from anywhere in New England. If the intent is to provide renewable energy at the lowest possible cost, there appear to be far more attractive sites than Prospect.

Historical Wind Generation and Capacity Utilization in the Northeast

			Wind Generation (MWh)			Capacity Factor %		
Wind Project	State	Capacity	2007	2008	2009	2007	2008	2009
Hull II	MA	1.8	7,398	3,674	5,537	46.9%	23.3%	35.1%
Beaver Ridge	ME	4.5			12,251			31.1%
Mars Hill	ME	42	99,071	131,621	121,141	26.9%	35.8%	32.9%
Stetson Wind	ME	57			138,980			27.8%
Lempster Mountain	NH	24		10,319	62,478			29.7%
Jersey Atlantic	NJ	7.5	20,411	20,885	20,920	31.1%	31.8%	31.8%
Madison Wind	NY	11.5	21,254	19,067	19,859	21.1%	18.9%	19.7%
Fenner	NY	30	72,190	70,930	64,113	27.5%	27.0%	24.4%
Munnsville	NY	34.5		88,502	89,495		29.3%	29.6%
Somerset	PA	9	20,206	20,084	18,663	25.6%	25.5%	23.7%
Green Mountain	PA	10.4	7,694	8,299	7,809	8.4%	9.1%	8.6%
Mill Run	PA	15	32,786	36,735	38,034	25.0%	28.0%	28.9%
Bear Creek	PA	24	57,911	60,403	62,040	27.5%	28.7%	29.5%
Locust Ridge	PA	26	53,978	70,070	68,807	23.7%	30.8%	30.2%
ForwardWind	PA	29.4		21,440	42,516		8.3%	16.5%
Meyersdale	PA	30	73,392	75,720	76,171	27.9%	28.8%	29.0%
Casselman	PA	34.5		80,663	93,121		26.7%	30.8%
Lookout Wind Power	PA	37.8			83,608			25.2%
Searsburg	VT	5.2	10,511	10,235	11,589	23.1%	22.5%	25.4%
					Annual Avg.	26.2%	25.0%	26.8%

Q: Does BNE's application make any mention of the capital, operation, maintenance or other costs necessary to build and operate a wind project?

A: Such estimates are not provided in BNE's application. We would expect that a small 2 turbine operation as proposed would have higher production costs since it would be unable to enjoy the economies of scale or capital and operating cost savings from a much larger wind project

III Renewable Alternatives to wind

Q: What renewable energy sources are eligible to meet Connecticut's Class I Renewable Portfolio Standard (RPS)?

A: Connecticut's Class I Renewable Portfolio Standard (RPS) increases from 8% of total retail sales in 2011 to 11% by 2014, and then increases 1.5% annually to reach 20% by 2020. Connecticut utilities must submit Renewable Energy Credits (RECs) to cover their required portion of required Class I renewable energy. Eligible Class I renewables include solar, wind, geothermal, Landfill Gas (LFG), ocean and tidal power, sustainable (closed-loop) biomass facilities, and certain newer run-of-river hydroelectric facilities not exceeding 5 MW. Connecticut has limited solar, geothermal, ocean and tidal resources, while its wind resources are marginal. However, renewable energy from ten Northeast states[1] can be imported to meet Connecticut's Class I RPS. As a result, much of Connecticut's Class I renewables have been generated from out-of-state resources. In 2007, Maine supplied 54.8% of Connecticut's Class I RECs[2], while New Hampshire supplied 19.3%. Connecticut supplied only 2.5% of the Class I RECs. Maine has a disproportionately large share of New England's renewable power projects because developers have constructed renewable projects in areas with cost-effective resources (i.e. wind and hydro projects in Maine). Connecticut has few cost-effective renewable resources, and has seen little development of wind projects to date.

Q: If Connecticut lacks the adequate wind resources to warrant cost-effective development, what other options exist in Connecticut's efforts to meet its renewable generation requirements?

A: However, New England is blessed with modest biomass (wood) resources, and a number of biomass wood plants are in various stages of advanced development in Connecticut and elsewhere across New England. NRG is re-powering Unit #5 at its Montville coal plant to use 300-400,000 tons of forest residues, tree trimmings and clean, recycled wood each year as its main fuel source. The 40-MW plant is scheduled to be completed in July 2011.

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[1] Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont,

In July 2010, the Connecticut Clean Energy Fund awarded Plainfield Renewable Energy LLC $500,000 to proceed with development of its 37.5 MW plant.

Q: If completed, how much renewable power would these biomass projects produce compared to Prospect Wind?

A: If completed, Montville #5 and Plainville would generate approximately 511,000 MWh of renewable energy annually[3]. This represents more than 60 times the renewable power that Prospect Wind would produce, according to the BNE's application. Biomass power plants generally operate as baseload units, and produce a relatively consistent supply of electricity vs. wind. As a result, renewable power produced from biomass plants is generally substantially cheaper than wind power.

Overall, 593.1 MW of biomass wood power plants are in various stages of development across the Northeast[4]. If only half of this biomass capacity is constructed, it would produce 1,948,000 MWh[5] of renewable power, or approximately 6.6% of Connecticut's total retail sales in 2009.

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[2] Source: Connecticut's 2007 RPS Compliance Report: http://www.dpuc.state.ct.us/electric.nsf/$FormRenewableEnergyView?OpenForm

[3] Assumes a 75% capacity factor for both projects

[4] Source: SNL Financial

Northeast Biomass Wood Power Projects under various stages of Development

Power Plant	Owner	State	Operating Status	Projected Generating Capacity MW
Ogdensburg Repower	Alliance Energy Group	NY	Under Construction	25
Berlin Wood Burning	Laidlaw Energy Group Inc.	NH	Planned	70
Russell Biomass	Westfield Paper Lands	MA	Planned	50
Pioneer Renewable Energy	Madera Energy Inc	MA	Planned	47
Montville 5 Repowering	NRG Energy Inc.	CT	Planned	40
Onondaga Renewables	Multiple	NY	Planned	40
Plainfield	Multiple	CT	Planned	37.5
Palmer Renewable Energy	Caletta Renewable Energy	MA	Planned	36.5
Mount Hope Biomass Power Plant	Mount Hope Hydro Inc.	NJ	Planned	30
Fair Haven Biomass Project	Beaver Wood Energy	VT	Planned	29
Pownal Biomass Project	Beaver Wood Energy	VT	Planned	29
Hopkinton Biomass	Diagnostic Inc	NH	Planned	28
Clean Power Berlin Cogen Plant	Clean Power Berlin	NH	Planned	26.1
Madison Biomass Wood Facility	Madison Paper Industries Inc	ME	Planned	25
Henniker Biomass Facility	Laidlaw Energy Group Inc.	NH	Planned	20
Concord Industrial Park Project	Concord Steam Corp	NH	Planned	17
Dunkirk Biomass Project	NRG Northeast Generating LLC	NY	Planned	15
IntelliWatt Renewable Biomass Wood Project	IntelliWatt Renewable Energy	PA	Planned	13
Newton Falls Fine Paper	Newton Falls Fine	NY	Planned	10
Lakes Region Pellets	Sanco Energy LLC	NH	Planned	5
			Total	**593.1**

Q: What would represent a sensible plan for development that would enable Connecticut to achieve its 20% Class I RPS requirements by 2020?

A: Connecticut has enacted incredibly aggressive renewable generation requirements relative to the state's actual renewable resource potential. In 2009, Connecticut retail power prices averaged 18.21c/KWh, the second highest rate nationally (behind only Hawaii) and 84% higher than the nationwide average of 9.89c/KWh. These high prices are largely a result of the state's heavy reliance on nuclear and natural gas, and minimal usage of low-cost coal generation.

Deriving 20% of all electricity sales from higher-cost renewables by 2020 will likely push power costs even higher for Connecticut consumers. Therefore, it is crucial that sensible, cost-effective renewable power projects are developed to protect the ratepayer from further increases in power prices. Development of the Montville and Plainfield biomass plants, coupled with the construction of wind projects in areas with superior wind resources vs. Prospect wind (along the Southern Coast by New London, or offshore) would represent a sensible step in meeting

[5] Assumes 75% capacity factor

Connecticut's Class I RPS requirements. The remainder of the renewable generation requirements could be imported from elsewhere in New England (wind in Maine, biomass from New Hampshire, etc)

IV: Conclusions

Prospect Wind has provided little detail on any number of their assumptions which are crucial to evaluating the competitiveness of the proposed project, including the rationale behind the 30% capacity factor. They have also failed to detail potential construction, operation and maintenance costs of the two turbines. With this data unavailable, this analysis regards Prospect's wind resources as marginal, as the turbines would operate relatively inefficiently vs. areas with superior wind resources. This would result in higher power production costs, and the developers would likely need to charge a higher price for their power to cover their costs and make a profit. Prospect residents will likely be uncomfortable paying higher power prices for an inefficient wind project when other renewable options are available.

Exhibit DHP I

Wind Power Production Costs at Different Capacity Factors

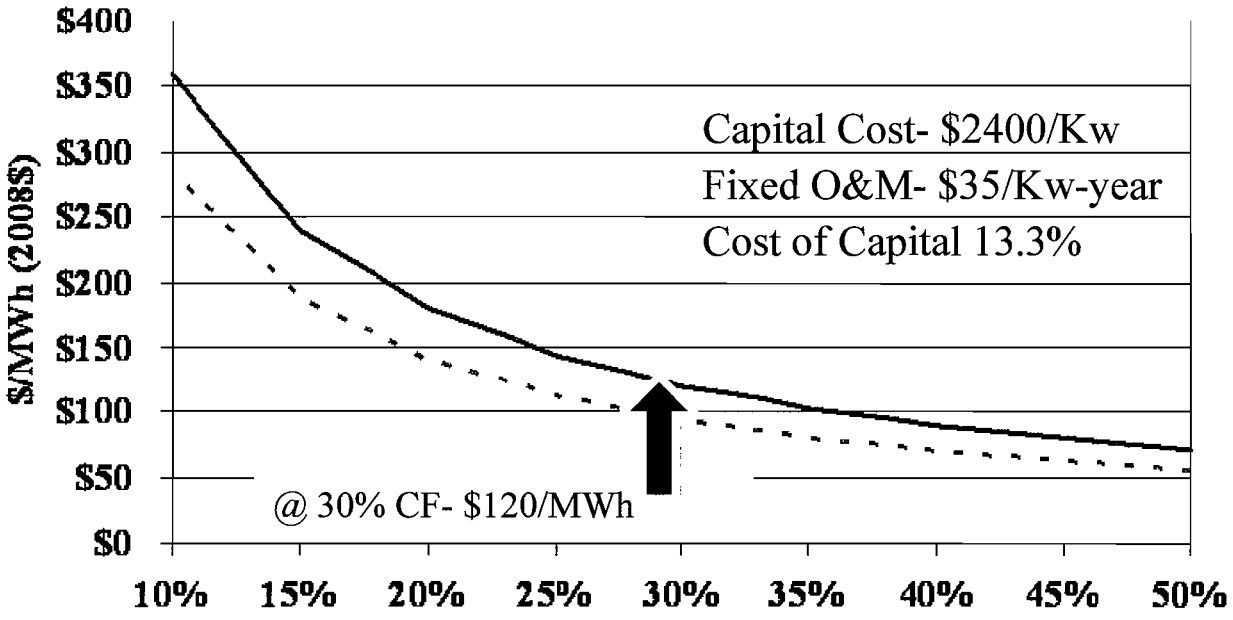

Exhibit DHP II

Connecticut Wind Resources at 80m

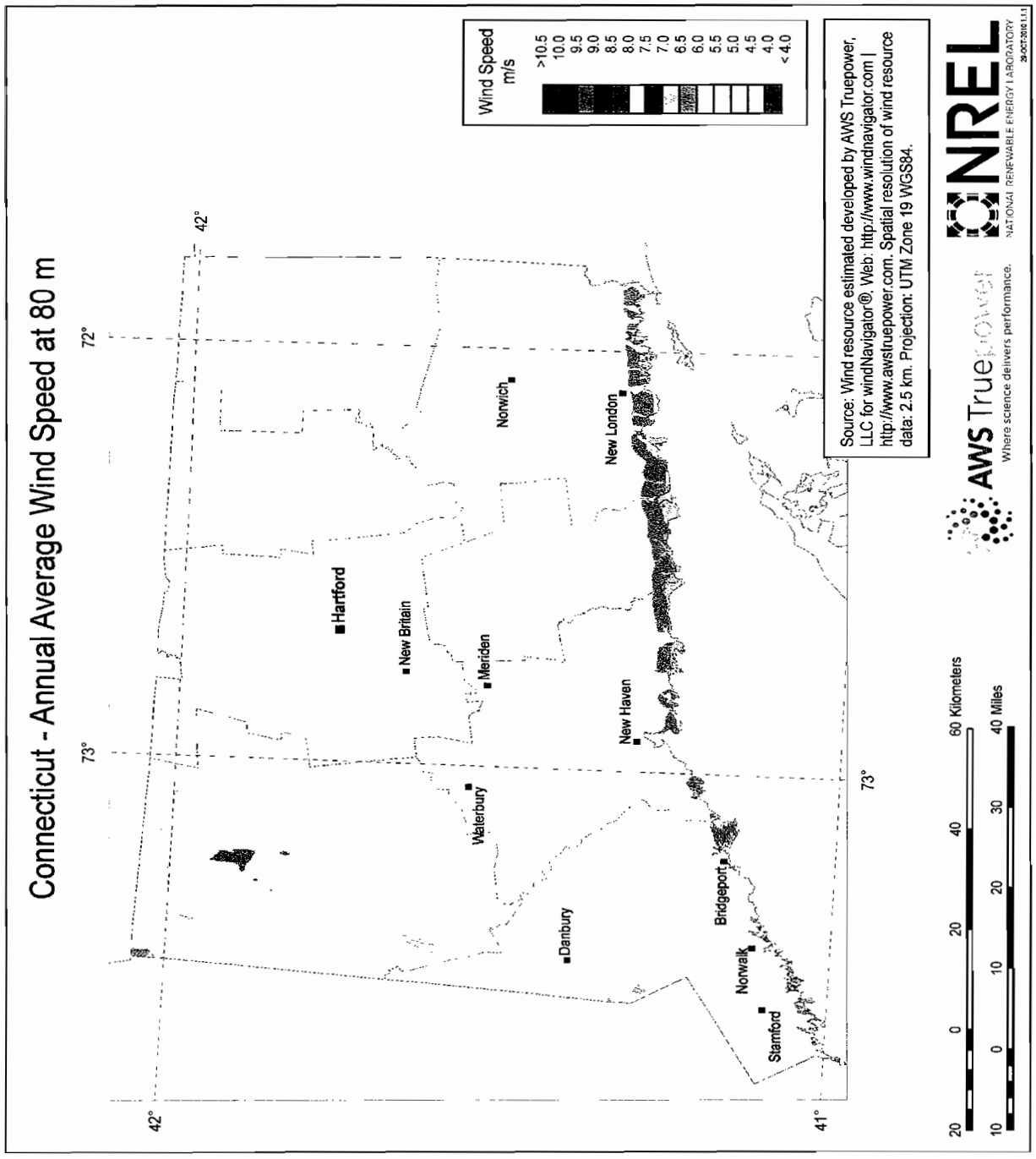

Exhibit DHP III:

Commercial on-shore and off-shore wind speeds at 50m

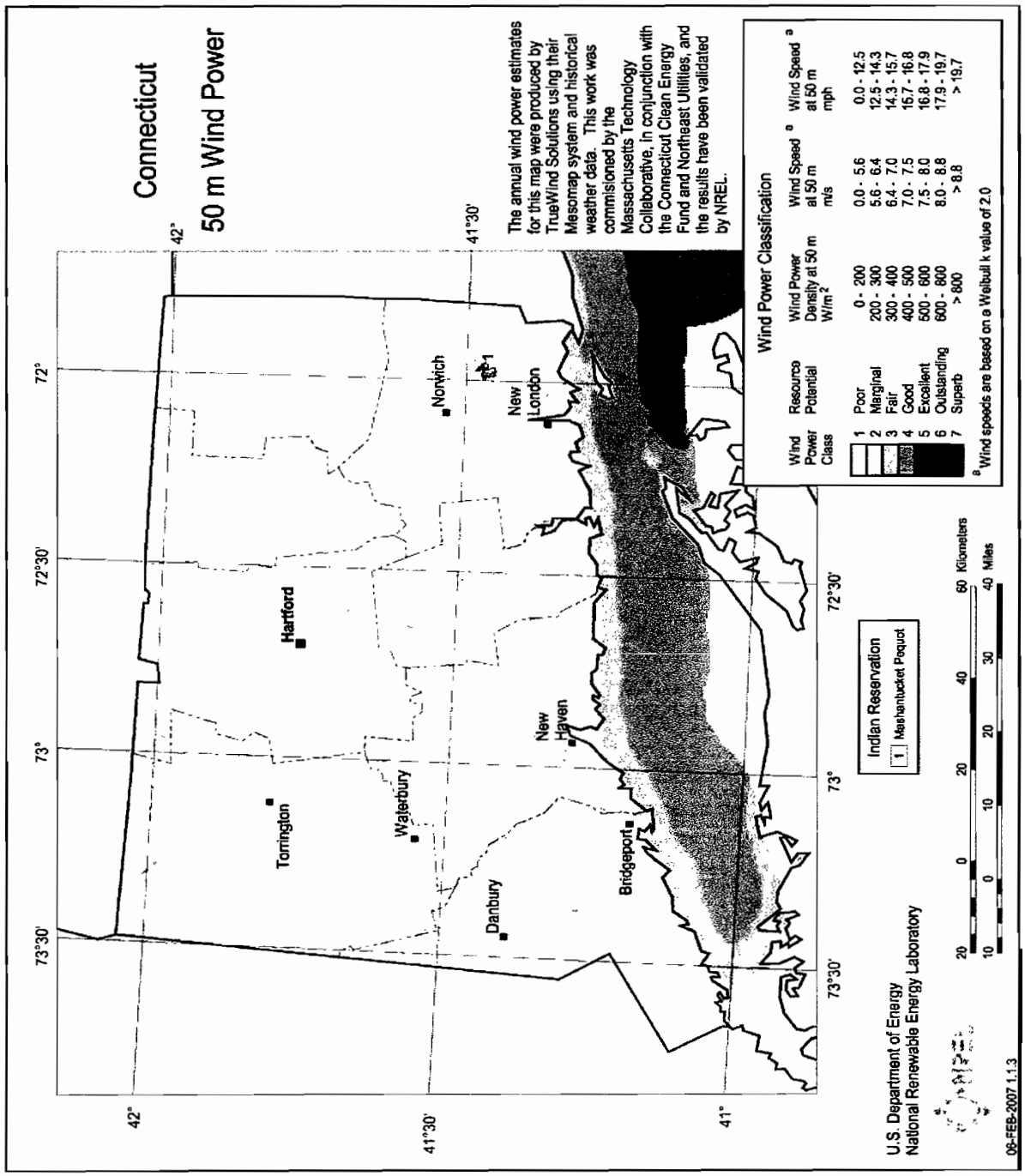

Exhibit DHP IV:

Maine Avg. Annual Wind Speeds at 80m