

THE STATE OF NEW HAMPSHIRE

SITE EVALUATION COMMITTEE

DOCKET NO. 2012-01

APPLICATION OF ANTRIM WIND ENERGY, LLC

SUPPLEMENTAL-2 TESTIMONY OF LISA LINOWES

INDUSTRIAL WIND ACTION GROUP

OCTOBER 23, 2012

1) Please state your name and address and qualifications.

My name is Lisa Linowes. My address is 286 Parker Hill Road, Lyman, NH 03585. My qualifications remain the same as those presented in my pre-filed direct testimony submitted July 31, 2012.

2) Please summarize your current position as it relates to this matter.

I serve as Executive Director of the Industrial Wind Action Group (Windaction.org) a New Hampshire corporation formed in 2006.

3) What is the purpose of this testimony?

The Industrial Wind Action Group, and other parties, were deprived of any opportunity to review the Deloitte Report, including a redacted version of the report, until after the October 11 deadline for supplemental testimony. Antrim Wind Energy LLC ("Applicant") had access to the entire report on, or around, September 25, 2012 and prepared supplemental comments relative to the report. The SEC's prohibition was relaxed on October 18 order permitting the parties access to the redacted version of the

report. The purpose of this testimony is to supplement my prefiled direct testimony as it relates to the Deloitte report.

4) Are you familiar with the Deloitte report?

Yes. I read the redacted version of the report.

5) In the section of the Deloitte report entitled "Comparison to Comparable Facilities", the authors state "while we cannot say definitively that the Applicant's cost estimate is unrealistically low, it does appear to be 10 to 20 percent lower than comparably sized recent projects." Do you agree with this finding?

The Deloitte report relies on the *Lawrence Berkeley National Laboratory 2011 Wind Technologies Market Report*¹ to compare project capital costs. Deloitte correctly cites from the report that New England is one of the highest-cost regions, however, in its table on page 23, Deloitte lists cost for only one project sited in New England.

The below table lists project costs for eight wind energy facilities operating or under construction in New England. AWE's proposed project cost of \$55-65 million is well below average capital costs for wind energy in the region and below the median project cost of \$2,403/kW.

The particulars of any one project govern capital costs and it is likely that if we were to examine any of the projects listed in the table we would observe general reasons behind the cost per kilowatt. All of the projects cited, with the exception of AWE, use existing turbine technology. Competition from Asian turbine manufacturers has been a recent factor driving down the cost of existing technology but this trend cannot be assumed on newer technology. AWE relies on new technology that has not yet been commercialized. It is reasonable to expect AWE turbine costs to be higher than existing technology. Since AWE has not secured a contract with Acciona for the AW-116 3 MW turbine, we cannot know the cost/kW. In their supplemental testimony, Mr. Cofelice and Mr. Pasqualini claim that updated proposals from turbine suppliers were made available to Deloitte (*page 9 at 17*). Apparently, AWE is still shopping for a turbine supplier, however, the SEC has prohibited all parties, other than Counsel for the Public, from examining AWE project information so we cannot comment. But based on information presented in the

¹ <http://eetd.lbl.gov/ea/ems/reports/lbnl-5559e.pdf>

Deloitte report, AWE appears to grossly understate project cost. We have seen no information to suggest AWE has any leverage for negotiating lower turbine costs.

Project	Location	In Service	Capacity		
			(kW)	Cost	Cost/kW
Sheffield Wind	VT	October-09	40,000	\$90,000,000	\$2,250
Granite Reliable Power	NH	March-12	99,000	\$229,000,000	\$2,313
Groton Wind	NH	December-12	48,000	\$120,000,000	\$2,500
Hoosac Wind	MA	under const.	28,500	\$90,000,000	\$3,158
Record Hill Wind	ME	January-12	50,600	\$120,000,000	\$2,372
Kibby Mountain Wind	ME	November-10	132,000	\$320,000,000	\$2,424
Georgia Mountain Wind	VT	under const.	10,000	\$30,000,000	\$3,000
Kingdom Comm. Wind	VT	under const.	63,000	\$150,000,000	\$2,381
Antrim Wind Energy	NH		30,000	\$55,000,000	\$1,833 ²
AVERAGE COST/KW					\$2,550

We note that Table 1 (page 4) of the Deloitte report, suggests AWE has consistently understated project cost (tables show project cost at \$45 million) even in comparison to other projects it has proposed in Vermont and Maine.

6) In the section of the Deloitte report entitled "Capacity Factor" the authors state that compared to similar facilities in the northeastern U.S., the project's capacity factor assumption is "*within the range of observed capacity factors, however, it is near the upper end of the range and well above the mean, median, and upper quartile of the data.*" Do you agree with this statement?

I agree that AWE has overstated its average annual capacity factor ("CF") relative to operating projects within New England and the Northeast.

However, the Deloitte report appears to grossly understate CFs for many projects. While the data for New York wind projects are accurate³, many of the other projects are suspect. In particular, the Highland Wind

² AWE Application (\$65 million cost equates to \$2,167/kw)

facility in PA (58.75% CF) is unrealistically high; Project capacity factors for Kibby Wind (24.08%), Record Hill (17.51%) and Rollins Wind (11.23%) are too low. Average annual capacity factors that are unrealistically high, or low, generally suggest the CF was derived from partial years of operation.

Still, the question of capacity factor raised by Deloitte has merit. Actual performance data is superior to estimates that are based on wind data. In fact, wind projects in much of the east, including New York and New England have consistently been found to operate at lower average annual capacity factors than pre-construction wind data would suggest. All of the wind projects in New York listed in Deloitte's table (pages 25-26) claimed capacity factors of 30% or better based on wind data but we can see from the table that performance fell far short. There is no available data to suggest New England onshore winds support annual average capacity factors above 36% which is the highest CF reported at the Mars Hill, Maine wind facility. This occurred in the first year of operation (2007-08). No other project, including Mars Hill, has achieved this level since.

AWE claims that new technology, higher hub heights and a larger rotor diameter will facilitate a better capacity factor but we note that Cape Wind, which will be using state of the art offshore technology, is claiming a pre-construction annual average capacity factor of 39%. Unlike onshore wind, offshore facilities do not have to contend with icing or ground obstacles (including trees) that can create turbulence and lower performance. In addition, wind conditions offshore are expected to be more steady and prevailing from a specific direction which differs from the thrashing wind conditions found on New England ridgelines. AWE's claimed higher CF is not realistic.

7) Why is it important that project cost and capacity factor be properly represented in AWE's application before the SEC?

AWE states that the project's ability to raise capital depends on many factors including "execution of a financeable power purchase or financial hedge agreement for the offtake of power" (*See re: Application Of Antrim Wind Energy, LLC For A Certificate Of Site And Facility at 55*). Since wind energy has no fuel cost, thus no variable cost, project capital costs and capacity factor largely determine the price of its energy. The lower cost estimates and inflated CF make the project appear to the SEC as an attractive option for

³ The New York data appears to have been validated using the NYISO's annual Gold Book which lists resource production numbers.

investors and energy buyers. In fact, such extreme deviations from more typical wind projects operating or under construction in New England should raise doubt in investors.

8) In the section titled *Revenue* (page 24), the Deloitte report states that the "*two primary assumptions that drive revenue for a wind farm are capacity factor and the price of energy generated by the wind farm.*" Do you agree?

Yes, in part. Power purchase agreements ("PPA") negotiated for wind energy in New England typically represent an all-in price which includes energy, capacity, and renewable energy credits ("REC"). In some instances, RECS are contracted separately. The federal production tax credit ("PTC") is another important revenue consideration.

The PTC offsets the high price of wind energy, giving the false impression that wind is competitive with other resources, but at 2.2¢/kWh, the subsidy's pre-tax value (3.4¢/kWh) equals, or exceeds the wholesale price of power in much of the country. Without the PTC, developers would need to substantially lower their capital costs and narrow the price gap to make up the difference. However, cost reductions will carry the industry only so far.

As long as wind farms operate at much lower annual capacity factors than more reliable energy sources, there are too few hours of generation per year to spread the large upfront capital costs over. Energy sales alone are not sufficient to recoup capital costs or earn a profit because of two well known limitations of wind power. First, since wind typically generates at a time of day and year when the energy is least needed, the competitive market price for its energy is low. Second, wind projects must be sited at the fuel source, which, for onshore wind is typically long distances from load. Locational constraints further lower the market value of wind energy as well as drive up the cost of delivery (i.e. transmission).

The Deloitte report mentions that the price of AWE's energy will have to increase by 2.2¢/kWh if the PTC is not extended. In fact, the price would have to increase by the pre-tax equivalent of 3.4¢/kWh to compensate for the loss of the PTC. Since the price of energy in New England is set in a competitive market, the loss of the PTC will likely be reflected in increased REC prices. However, with REC prices at or near the alternative compliance payment ("ACP"), it is not evident how wind projects in New England will recoup the loss of the PTC.

9) Do you agree with the Deloitte report where it states that "*low Renewable Energy Certificate ("REC") prices have made it less expensive for utilities to meet RPS without entering into PPAs with owners of renewable projects or buying/developing such projects themselves?*"

No. It appears that Deloitte has limited knowledge of the REC market in New England. However, I would disagree with any representation that REC prices will remain high for the foreseeable future.

REC prices, while at or near the ACP today, were priced at around \$10 (Class I MA RECs) just 2 years ago and we can reasonably expect the market to show changes in REC prices with prices shifting downward. But compliance will not come entirely from in-region greenfield projects.

New York and Canada continue to build renewable resources which qualify under New England RPS policies. Since 2008, over 40% of the supply of Massachusetts Class I RECs has come from imported resources located in adjacent control areas. These resources accounted for about 1.225 million MWh annually. Adding imported resources qualified in other New England states raises the 2011 total to about 1.425 million MWh. We can expect more NY wind to enter New England as NYSERDA contracts end beginning in 2016. The same may be true for renewables under contract with Hydro Quebec.

In addition to imports, there are substantial amounts of existing renewable resources within the ISO-NE control area that are already qualified or have the potential of becoming qualified under one or more of the state RPS programs. For example, of the 16 large biomass power plants, all but two have been certified as Class I resources in one or more New England state RPS programs. The newest one was interconnected in 1994. In 2011, such facilities produced nearly 1.9 million MWh and in prior years have generated as much as 2.4 million MWh.

In the past several years, large numbers of behind-the-meter generators have also become qualified as renewable resources. For example, several biomass boilers at paper and pulp mills have become qualified as Class I resources. For 2011, these forms of generation produced nearly 750 thousand MWh.

Imports, existing and behind-the-meter resources produced in excess of 4 million MWh⁴ of the approximately 5.25 MWh of class I RECs generated in 2011 or about 80% of New England's "new" renewable supply. More are expected to come online which will drop REC prices and challenge AWE's ability to demand high REC prices in the future.

Deloitte omits this discussion altogether while AWE attempts to justify continued high REC prices.

10) Do you agree with the Deloitte report that it is "*unlikely that a project finance investor would take on the risk of financing the project without a committed offtake agreement?*"

Yes.

11) Given what you know about the New England energy market, will a long-term power purchase agreement (PPA) be difficult to secure?

Yes, I believe it will. The wind energy market is experiencing significant uncertainty right now following a spike in development largely attributed to the federal Section 1603 cash grant program which has now expired. Congressional House members and many in the Senate have signaled they will not support a long-term extension or possibly any extension of the PTC after the subsidy expires at the end of this year. The Deloitte report correctly states that the Energy Information Administration has forecasted wind development growth to be flat if the PTC is not extended. However, Deloitte ignores that EIA forecasts no/low wind development even in the "no sunset" scenario where the PTC does not expire. This is largely due to projected low natural gas prices and the fact that State mandates for renewables are anticipated to be met. The Deloitte report claims "other 2013 forecasts" show larger growth but the authors provide no reference to validate their claim.

Across several pages, Deloitte goes to great pains to develop a levelized cost of wind in New England in an effort to determine the contract price for AWE's energy. Since the wholesale energy market in the six states of New England is unregulated, energy prices are set within a competitive market. An exercise that examines levelized costs is misplaced. REC prices are also set by the market up to the cap known as the

⁴ This number may be considerably higher when one adds existing New England landfill gas and small hydro-electric facilities that in recent years became qualified in the various Class I RPS programs.

alternative compliance price. The REC market exhibits binary trends depending on whether compliance has been met. But as discussed in question 9 above, REC prices will likely trend downward in the coming years. Energy prices will remain low.

In the past, when REC prices were low, energy prices were high. If REC prices drop again, we cannot assume energy prices will rise high given the abundance of low-cost natural gas. Flat demand for energy has constrained the need to build new capacity in the region. In contract negotiations, wind developers will seek to secure a buffer from low REC prices and place the risk elsewhere. At the same time, we can expect utilities to resist contracts that lock in prices at the highest levels. State regulators should take note of contract prices that are significantly above market rates. It would be reasonable to expect utilities to negotiate conditions that avoid fixed price contracts over the long term.

Fixed-price contracts shift all risk to the ratepayers who are on the hook to pay the delta between market price and contract price. There is no cost benefit to ratepayers should wholesale energy and REC prices decline, nor will there be until the end of the PPA, which by that time the turbines will have reached the end of their useful life.

A loss of the PTC coupled with low competitive energy prices and fluctuating REC prices together erode AWE's ability to secure a long-term PPA akin to that signed between NSTAR and Groton Wind or Green Mountain Power with Granite Reliable Power.

12) In the section of the Deloitte report titled "Overview" (Page 6), the authors present the case for continued wind deployment in the coming years. Do you agree with their summary?

No. The wind energy market is experiencing significant uncertainty right now following a growth spurt (2009-2012) which was triggered by the stimulus package and the federal Section 1603 cash grant program now expired. Congress has signaled it will not support a long-term extension of the PTC and may let the subsidy expire at the end of the year. The PTC is one of sixty-plus tax extenders to be considered in the 2012 *lame duck* session of Congress.

The Deloitte report correctly reports that the Energy Information Administration has forecasted wind development growth to be flat in the next ten years if the PTC is not extended. However, Deloitte ignores

that EIA also forecasts no/low wind development even in the scenario where the PTC is extended. This is largely due to projected low natural gas prices and the fact that State mandates for renewables are anticipated to be met. The Deloitte report claims "other 2013 forecasts" show larger growth but the authors provide no reference to validate their claim.

With wholesale electricity prices substantially below retail prices, State legislators are taking note of the high cost of their RPS policies. The State of New Hampshire recently amended its RPS to help lower costs while other states are following suit.

13) Does this complete your pre-filed testimony?

Yes. The SEC has prohibited IWA from accessing the non-redacted Deloitte report and other AWE materials that were granted protective treatment by the SEC and given only to Counsel for the Public. Without access to the additional information, I am unable to provide further comment.