

**THE STATE OF NEW HAMPSHIRE**

**BEFORE THE**

**SITE EVALUATION COMMITTEE**

**DOCKET NO. 2012-01**

**APPLICATION OF ANTRIM WIND ENERGY, LLC  
FOR A CERTIFICATE OF SITE AND FACILITY**

**PREFILED DIRECT TESTIMONY OF**

**MATTHEW MAGNUSSON**

**ON BEHALF OF**

**ANTRIM WIND ENERGY, LLC**

**October 11, 2012**

1 **Background and Qualifications**

2 **Q. Please state your name, business address and qualifications.**

3 A. My name is Matthew Magnusson. My business address is: PO Box 302,  
4 Hampton Falls, NH 03844. More detailed information about my background and  
5 experience is contained in my résumé which is provided as Attachment MM – 1.

6 **Q. Who is your current employer and what position do you hold?**

7 A. In the work I performed for Antrim Wind Energy, LLC it was as a self-employed  
8 contractor.

9 **Purpose of Testimony**

10 **Q. What is the purpose of this testimony?**

1 A. The purpose of this testimony is to supplement the prefiled testimony Dr. Gittell  
2 filed on January 31, 2012 in this docket. Because he has taken a new position, Ross  
3 Gittell will not be testifying in this docket; I will be responsible for the testimony he filed  
4 in this docket which I helped to prepare. I also want to respond to arguments made by  
5 Ms. Linowes and Mr. Block against some of the findings of the economic impact analysis  
6 work performed by Ross Gittell and myself.

7 **Q. Are you familiar with the Project that is the subject of this proceeding?**

8 A. Yes. In the fall and winter of 2011-2012 I worked with Ross Gittell on an  
9 economic impact analysis of the Antrim Wind Energy project commissioned by Antrim  
10 Wind Energy, LLC.

11 **Prefiled Testimony of Lisa Linowes**

12 **Q. Have you read the prefiled testimony of Lisa Linowes?**

13 A. Yes, I have.

14 **Q. Please comment on her testimony related to the economic impacts of the**  
15 **Project, particularly her criticism of the JEDI wind model.**

16 A. Ms. Linowes asserts that the JEDI wind model used in the economic impact  
17 analysis “produces unrealistically high estimates of economic benefit for localities in  
18 both potential jobs and potential economic activity.” She does not provide any studies  
19 that dispute the validity of the model nor does she provide any factual statistics proving  
20 instances of where the model has produced invalid results. This model was developed in  
21 2004 by the U.S. Department of Energy/National Renewable Energy Laboratory and has  
22 been tested and refined since that period of time. It is a widely utilized model by

1 academics and private consultants. The Dept of Energy website  
2 ([http://www.windpoweringamerica.gov/filter\\_detail.asp?itemid=707](http://www.windpoweringamerica.gov/filter_detail.asp?itemid=707)) lists 15 studies  
3 involving the JEDI model for estimation of job related impacts. Furthermore, JEDI is a  
4 subset of a much broader family of economic impact modeling tools called input-output  
5 models. Modern versions of input-output models have been in existence since the 1970s  
6 and form the backbone of a significant portion of the economic impact analysis  
7 conducted today. Specifically, JEDI relies on economic factors calculated by the  
8 IMPLAN model which was originally developed by the U.S. government but has been  
9 maintained and improved by the corporation MIG, INC. The IMPLAN software is one of  
10 the most widely used input-output models in use today. Altogether, there is considerable  
11 credibility to the JEDI model and its application for estimating the economic impacts of  
12 wind power projects. Lastly, Ross Gittell has extensive experience with the NH economy  
13 and is the economic forecaster for NH in the New England Economic Partnership. He  
14 has conducted significant research on the NH economy over the past 19 years and he did  
15 not find any of the economic impact data produced by the JEDI model to be unreasonable  
16 given the scope of construction and the information provided from the studies and reports  
17 cited in our economic impact analysis.

18 **Q. Please comment on Ms. Linowes' testimony to the effect that the study does**  
19 **not adjust for energy price changes and property value changes.**

20 A. Ms. Linowes states the economic impact study is invalid because it does not  
21 adjust for energy price changes or property value changes. Our analysis did not model  
22 energy price changes resulting from the Antrim Project because we did not have any

1 evidence that this Project would result in higher or lower regional wholesale electricity  
2 prices as a result. Given that it is a 30 MW wind facility in the context of 33,174 MW of  
3 current total generating capacity in New England, our expectation is that the Project's  
4 impact on regional wholesale electricity prices would be negligible. Ms. Linowes does  
5 not present any energy modeling impact analysis of the Antrim Wind Project to dispute  
6 this assumption. Nor did our analysis find any evidence to substantiate statistically  
7 significant changes in property values, this included specific consideration of the  
8 Lempster Wind Power Project in NH. Therefore, Ms. Linowes statement of "negative"  
9 impacts of the Project without direct evidence to back up these assertions is not a  
10 reasonable basis for invalidating the findings of our economic impact analysis.

11 **Q. Do you wish to comment on the Vermont study cited by Ms. Linowes?**

12 A. Yes. The study cited by Ms. Linowes, "The Economic Impacts of Vermont Feed-  
13 In Tariffs," actually supports and does not dispute our findings. The study's modeling of  
14 a 47.8 MW mix of renewables (including solar PV, biomass, wind, hydro, methane, and  
15 landfill gas) is not directly comparable for several reasons as these technologies all have  
16 different costs and performance features and the study evaluates these technologies in the  
17 context of a feed-in tariff; a feed-in tariff is not a feature of the Antrim Wind Project.  
18 Also the cost in the Vermont study was \$4.79 million per MW while this Project is  
19 projected to be closer to \$2.0 million per MW (a 57% difference). However, the overall  
20 finding is relevant, even when considering that the cost was over twice per MW the cost  
21 of the Antrim Wind Project; it still showed that the Project had net positive job and  
22 income impacts. The study states in its conclusion: "The Feed in Tariff program is

1 expected to increase Vermont capital investment and create jobs during its 26 year life  
2 cycle.” They associated 894 job-years of employment and \$55 million in increased  
3 wages as a result of the investment in renewables. Ms. Linowes is only presenting half of  
4 the findings of that study in her testimony by discussing distribution of benefits and not  
5 net impacts. Our study is a net impact analysis. Also of note in that study is that it  
6 projects 557 jobs would be created in Vermont during construction from an in-state  
7 spending of \$75.4 million. This is equivalent to 7.38 jobs per million spent. Their in-  
8 state spending was based on an assumption of 33% of capital expenditures being spent in  
9 Vermont.

10 **Q. How do the assumptions in the Vermont study compare with assumptions**  
11 **used in your modeling?**

12 A. This assumption of in-state spending in the Vermont study is very consistent with  
13 the assumptions used in our modeling. Based on our own experience gained from the  
14 expenditures of the Groton Wind Power Project and the Granite Reliable Wind Project  
15 combined with confidential contractor estimates and data provided by Antrim Wind, we  
16 assumed the following proportions of local spending for the JEDI model: Foundation  
17 labor at 30%, Erection labor at 30%, Electrical labor at 30%, Management labor at 30%,  
18 local construction materials at 40%, transformer materials at 0%, and electrical materials  
19 at 30%. Our analysis using the JEDI model estimated 86 NH jobs during the construction  
20 phase based on an in-state project expenditure of \$17.7 million. This is the equivalent of  
21 4.85 jobs per million spent. Although the Vermont study includes renewable  
22 technologies other than wind, an evaluation of jobs based on per million spent is

1 reasonable and this shows that our study provides a more conservative estimate of job  
2 activity than the study cited by Ms. Linowes on a dollar expenditure basis.

3 **Q. Do you wish to comment on Ms. Linowes' reference to the availability of jobs**  
4 **construction data for wind power projects in New England?**

5 A. Yes. In her testimony Ms. Linowes mistakenly assumes that because 36 turbine  
6 installations have been installed in New England jobs construction data for those projects  
7 is publicly available. Contractors are very protective of their construction and labor costs  
8 and there is limited availability of published jobs data. However, we do believe that, in  
9 general, New England installations have higher labor requirements compared to other  
10 areas of the country based on the limited amount of data we have been provided from  
11 contractors on the wind power projects we have evaluated and also from a common sense  
12 perspective. A significant portion of New England projects are built on the tops of  
13 forested mountains with limited access. As we discuss in our report, more labor is  
14 required to remove timber, develop roads, and protect natural resources in these areas  
15 compared to many projects in other areas of the country that are built on flat, non-  
16 forested areas. It therefore makes sense that a project on a forested mountain, like  
17 Antrim Wind, would have higher labor requirements.

18 **Q. Do you wish to respond to Ms. Linowes testimony on induced impacts?**

19 A. Yes. Ms. Linowes disputes the use of induced impacts in the economic impact  
20 analysis. Calculation of induced benefits is a common feature of economic impact  
21 analysis. Input-output models, validated to the NH county level, were used in this  
22 analysis. Again utilizing common sense, if a wind project sources any materials locally,

1 like gravel for a road, there will be indirect impacts because the gravel pit needs to  
2 employ workers to extract and transport the gravel. Local workers at the wind project  
3 and the gravel pit need to buy food at the grocery store or clothing from a local retailer.  
4 These establishments need to employ people to provide those goods or services (the  
5 induced impact). Multiplier factors for induced output from input-output models are  
6 well-accepted and they take into account the rate at which money “leaks” from a local  
7 economy. In this analysis, 16 total jobs are estimated to be induced by the economic  
8 activity of the Project; the JEDI model estimated a total of 70 direct and indirect local  
9 jobs. In addition, the Vermont study cited by Ms. Linowes utilized the economics model  
10 REMI. The REMI economic model also includes induced economic impacts.

11 **Q. Do you wish to comment on Ms. Linowes’ testimony regarding the number of**  
12 **jobs being created by a wind project?**

13 A. Yes. An important point to raise is that economic impact modeling does not  
14 provide the “true” number of jobs created, what it does do is provide a reasonable point  
15 estimate that is an indicator of the total labor impact of the project. While it is possible  
16 that 86 jobs could be created throughout NH as a result of the Antrim Project, it is  
17 unlikely to be the “actual” number, but it gives a sense of magnitude. Are we talking  
18 about a 1,000 jobs from the Project? No. Are we talking about 10 jobs from the Project?  
19 No. Somewhere between 50 and 100 full-time equivalent jobs? Highly likely. In other  
20 words, it isn’t going to change the overall unemployment rate in NH, but it also adds  
21 more than a trivial number of jobs to the local area of the Project, which is especially  
22 important given the high rate of unemployment relative to historical levels of

1 unemployment in NH and the fact that the unemployment rate has been rising in the past  
2 several months.

3 **Q. Do you agree with Ms. Linowes' concerns related to the Lempster property**  
4 **value impact assessment?**

5 A. No. Ms. Linowes asserts that the studies we cite are flawed and misleading. We  
6 reviewed six studies that looked at actual property transactions, including ones that did  
7 find a statistically significant impact attributable to wind projects and we believe we were  
8 very transparent in our discussion of their findings in our report. Ms. Linowes does not  
9 provide any new studies that either reviewed the same data sets as the original studies or  
10 any studies utilizing new data sets that would call into question the overall finding of no  
11 statistically significant change in property values due to wind power projects. She does,  
12 however, reference a 5 page letter written by her to one of the study's authors. In this  
13 letter, she primarily expresses concern over using regression as a statistical technique for  
14 evaluating property values and some aspects of the design of the study. The use of  
15 regression in property value analysis, especially in the context of environmental  
16 externalities (which would include wind turbines), is a very common and accepted  
17 technique used in both academic research and private consulting. "A Survey of House  
18 Price Hedonic Studies of the Impact of Environmental Externalities" published in the  
19 Journal of Real Estate Literature is one of many that discuss this area.<sup>1</sup> Furthermore both  
20 of the study's authors have credible credentials. Dr. Ryan holds a B.S. in Civil  
21 Engineering from Stanford University and an M.S. and Ph.D. in Energy and Resources

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<sup>1</sup> <http://www.orr.org/downloads/boyleandkeilstudy.pdf>



1 from the University of California, Berkeley. Ben Hoen is a graduate of the Bard Center  
2 for Environmental Policy at Bard College with a Master of Science Degree in  
3 Environmental Policy. The letter Ms. Linowes sent to one of the authors does not  
4 provide any evidence or new analysis that contradicts their findings.

5 **Q. Do you agree with Ms. Linowes' testimony regarding the factual evidence**  
6 **concerning property values?**

7 A. No. Her testimony discussing the studies we evaluated does not provide any  
8 factual evidence to contradict their findings and does not change our finding that there  
9 has not been a statistically significant finding of long term property value impacts due to  
10 wind turbine projects. Ms. Linowes states: "Gittell and Magnusson seem to begrudgingly  
11 admit that Heintzelman found impacts, but repeatedly try to discount the findings  
12 claiming the phenomenon might be temporary and likely to disappear." In our report, we  
13 state: "Although, Heintzelman and Tuttle (2011) did identify some isolated negative  
14 impact in two counties in NY, their results were also mixed." They also looked at  
15 property values around the Maple Ridge Wind Farm located in Lewis County, NY, a  
16 wind project completed in 2006 which consists of 195 Vestas V82 (1.65 MW) turbines.  
17 They analyzed 1,955 total property transactions and found no significant impact  
18 due to the wind turbines and in fact found some instances of a positive increase. Ms.  
19 Linowes states: "The applicant has refused to provide actual sales data so that others can  
20 validate the findings in the report." We obtained deed transaction data that had been  
21 compiled by NH-based company Real Data Corporation. Our contract with them  
22 explicitly prohibits sharing the extracted line-item data with others. In our report and due

1 to a request as part of the hearing process we have provided aggregated data extracts.

2 There is nothing to prevent Ms. Linowes from paying Real Data Corporation for a data  
3 extract or obtaining records free of charge from the Register of Deeds to validate our  
4 results. We have no objection to being transparent, but we must honor the terms of  
5 agreements with other organizations. This data is available to Ms. Linowes through the  
6 channels discussed above.

7 **Q. Please explain the methodology you used to compare property valuations**  
8 **with sales transactions.**

9 A. The methodology we used in comparing property valuations with sales  
10 transactions is similar to the process used by the State of NH Department of Revenue in  
11 determining equalization for property appraisals.<sup>2</sup> Ms. Linowes expresses concern about  
12 square footage being greater for homes closer to the turbines. However, that is accounted  
13 for in our methodology of utilizing property valuations and comparing to actual sales  
14 price. Ms. Linowes has provided no new evidence to dispute the overall findings that  
15 "there is no evidence to suggest that the Lempster Wind Power Project has had any  
16 consistent, observable, statistically-significant impact on property values in Lempster or  
17 the communities surrounding the Project." This does not discount that there may be  
18 isolated rare instances where there may be some form of impact for residences located in  
19 close proximity to the facilities. In those cases, developers have entered into good  
20 neighbor agreements or property tax reassessments have occurred. Our report documents

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<sup>2</sup> [http://www.revenue.nh.gov/munc\\_prop/equalization/2006/documents/equalization\\_manual\\_2006.doc](http://www.revenue.nh.gov/munc_prop/equalization/2006/documents/equalization_manual_2006.doc)

1 two instances of property tax easements performed in part due to Lempster Wind. This  
2 does not change any of the discussion or the findings in our original analysis.

3 **Prefiled Testimony of Richard Block**

4 **Q. Have you read the prefiled testimony of Richard Block?**

5 A. Yes, I have.

6 **Q. Do you agree with Mr. Block's concerns related to the Lempster property**  
7 **value impact assessment?**

8 A. Mr. Block apparently retrieved MS listings for Lempster and Antrim and used  
9 that information to indicate that a greater percentage of Lempster's homes are for sale  
10 than Antrim's. This analysis does not account for any social, geographic, or economic  
11 differences between the two towns, nor does it indicate what the ratio of sales was before  
12 construction of Lempster Wind. We did not independently review his analysis so it may  
13 or may not be correct. Our position is that if Lempster Wind was having a negative  
14 impact on property sales this would be expected to be reflected in selling prices. Our  
15 analysis found no evidence of a statistically significant decrease in selling price in  
16 Lempster, therefore this analysis by Mr. Block does not indicate a negative impact due to  
17 Lempster Wind.

18 **Conclusion**

19 **Q. Based upon the testimony provided by Ms. Linowes and Mr. Block, would**  
20 **you change any of your conclusions regarding the expected economic impact of the**  
21 **Project or with respect to the conclusions of the Lempster property value study?**

1 A. No. I stand by our analysis and conclusions for the reasons stated in the reports  
2 and the testimony I have given here.

3 **Q. Do you have anything further to add to this testimony?**

4 A. No, not at this time.

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**Experience:**

2005–Current    **University of New Hampshire, Durham, NH**  
*Research Associate (Current official position: Project Director II)*  
Provide data collection, analysis, presentations and report authoring on project-based research.

*Summary of Research*

- **2012 (In progress) – Impacts of Climate Change on Winter Recreation Dependent State Economies in the United States**  
*Sponsor:* Natural Resources Defense Council, Protect Our Winters
- **2012 (In progress) – Economic Impact of the Port of Portsmouth and Piscataqua River Terminal Operators**  
*Sponsor:* Piscataqua River Economic Development Committee
- **2012 - Economic Impact of the Proposed Antrim 30 MW Wind Power Project in Antrim, New Hampshire**  
*Sponsor:* Antrim Wind Energy, LLC
- **2012 - Impact of the Lempster Wind Power Project on Local Residential Property Values**  
*Sponsor:* Antrim Wind Energy, LLC
- **2011 – Energy & Economic Impacts of the NH Greenhouse Gas Emissions Reduction Fund**  
*Sponsor:* New Hampshire Public Utility Commission
- **2010 – The Economic Impact of the Local Sea Food Industry in New Hampshire – Opportunity for Sustainability**  
*Sponsor:* University of New Hampshire Cooperative Extension
- **2010 – New Hampshire Medicaid Program Enrollment Forecast SFY 2011-2013 Update**  
*Sponsor:* New Hampshire Department of Health & Human Services
- **2010 – The Economic Impact of Local Food Systems in New Hampshire - Current Status and Prospects for Growth**  
*Sponsor:* University Office of Sustainability, NH Charitable Foundation
- **2010 – Economic Impact of the Proposed Groton Wind 50 MW Wind Power Project in Groton, New Hampshire**  
*Sponsor:* Groton Wind LLC
- **2009 – Economic Impact of Granite Reliable Power Wind Power Project in Coos County, New Hampshire**  
*Sponsor:* Granite Reliable Power LLC
- **2009– Economic & Greenhouse Gas Impacts of the New 2009 Fuel Economy (CAFE) Standards in New England**  
*Sponsor:* Carbon Solutions New England

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- **2009- New Hampshire's Green Economy and Industries: *Current employment and future opportunities***  
*Sponsor:* Rockingham Economic Development Committee (REDC), U.S. Dept. of Commerce- Economic Development Administration
- **2009 - Economic Analysis of Policies Proposed by the NH Climate Change Policy Task Force for the Governor's NH Climate Change Action Plan**  
*Sponsor:* New Hampshire Charitable Foundation
- **2008 - Economic Impacts of Regional Greenhouse Gas Initiative on New Hampshire**  
*Sponsor:* New Hampshire Department of Environmental Services, The Energy Foundation
- **2007- Economic Impacts of a State Renewable Portfolio Standard in New Hampshire**  
*Sponsor:* New Hampshire Department of Environmental Services
- **2006- Economic Modeling of Low Sulfur Heating Oil in the Northeast**  
*Sponsor:* Northeast States for Coordinated Air Use Management (NESCAUM)
- **2006 - Fiscal Impact of Lower Ignition Strength Cigarettes in New Hampshire**  
*Sponsor:* New Hampshire Office of State Fire Marshal

### *Summary of Other Work*

2012- "The Sustainable Business Case Book", co-author with Professor Ross Gittell and Professor Michael Merenda to be published by Flat World Knowledge

August 2009 - "Sustainability and Business" Chapter in "Exploring Business" textbook published by Flat World Knowledge

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|--------------|--|
| 2012         | <b>University of New Hampshire, Durham, NH</b><br><i>Adjunct Lecturer</i><br>Taught senior-level undergraduate Sustainable Business Models course. Instruction included grading, and course development.   |
| 2005-Current | <b>University of New Hampshire, Durham, NH</b><br><i>Lead Recitation Instructor</i><br>Lead classroom instruction for the Introduction to Business course. Instruction included grading, leading classroom discussion and course development.  |
| Fall 2004    | <b>Maine Green Power Connection, Brunswick, ME</b><br>Internship<br>Presented on the electricity options available to Maine businesses. Consulted with businesses on energy certification for their product lines. Evaluated the effectiveness of the Clean Power Maine marketing campaign and developed a system to track inquiries.                                |
| 2000-2008    | <b>University of New Hampshire, Durham, NH</b><br><i>Information Technologist III</i><br>Project manager for UNH Information Technology projects including management reporting and ERP system. Responsible for employee training of new IT related systems. Web application and database development of in-house applications for undergraduate student admissions. |

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### **Education:**

2012(in-progress) **University of New Hampshire, Durham, NH**  
PhD in Natural Resources & Earth Sciences

2005 **Whittemore School of Business and Economics, University of New Hampshire, Durham, NH**  
Masters Degree in Business Administration

1997 **University of New Hampshire, Durham, NH**  
Bachelor of Science Degree in Kinesiology

### **Certifications:**

2009 Building Analyst – Building Performance Institute