



Michael Donihue &lt;mrdonihu@colby.edu&gt;

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**Beaver Ridge Wind Project Tour**

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Todd Presson &lt;TPresson@jaycashman.com&gt;

Tue, Apr 28, 2015 at 12:50 PM

To: "D. Whitney King" &lt;dwking@colby.edu&gt;

Cc: Ken Boulier &lt;kboulier@jaycashman.com&gt;, Michael Donihue &lt;mrdonihu@colby.edu&gt;

Whitney,

I'm glad everything worked out. Ken is a fun tour guide, and I'm glad your students enjoyed their experience. There is nothing better than "seeing for yourself". Thanks also for sharing the blog link; it is interesting to see what the students are thinking and learning.

I have responded to your questions below in **bold type**. Please let me know if you have any further questions.

Best regards,

Todd

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**From:** D. Whitney King [mailto:[dwking@colby.edu](mailto:dwking@colby.edu)]**Sent:** Monday, April 27, 2015 10:22 PM**To:** Todd Presson**Cc:** Ken Boulier; Michael Donihue**Subject:** Beaver Ridge Wind Project Tour

Todd: We had a great tour of Beaver Ridge on Friday. Ken was a fantastic host and really impressed the students with his knowledge of the systems and passion for wind energy. Students are asked to write short takeaways on each lab and I have attached a link to these comments. Several more will be posted over the next few days.

<http://web.colby.edu/joules-to-dollars/beaver-ridge-wind-farm-tour/>

The students have some additional questions.

Actual Turbine model: Assume GE1.5sle ??? **Yes, GE 1.5sle.**

Cost of turbines: We estimate an installed cost of \$7.3M. Would this include the real cost of land and permitting? **The total cost of the project, including permitting, land rights, etc, was considerably higher, \$11.2 million. Some of that (~\$1.36 million) went to utility upgrades that are now owned and operated by Central Maine Power.**

Investment Credits: We assumed a Production Tax Credit of 0.022 \$/kWh with a 2.50 % yr escalation for ten years. **The PTC is currently \$0.023/kWh, and it increases with CPI as a “step function”. The next time the PTC increases will be when the inflation adjusted level reaches \$0.0235, at which point it will change to \$0.024.** What other incentives are available for wind development? **The PTC is the only direct incentive currently in place. As you note below, the energy producing equipment (i.e., the turbines) are eligible for accelerated depreciation (5-yr MACRS), which provides a greater tax shield in the initial five years of operation, rather than spreading it out over the life of the project. There are also market-based incentives (commonly referred to as renewable energy certificates, or RECS), available in different New England states that require utilities to include a certain percentage of renewable energy in their portfolios, which can influence price.**

90% Depreciation over 5 years. **Yes, the turbines and associated energy property qualify for the 5 yr accelerated depreciation.**

We get an annual energy production of 13.4 M kWh or 34% of faceplate ratings. **During the first 6-yr of operation, the site averaged 12,134 MWh per year.**

These figures are generated using the National Renewable Energy Labs System Advisor Model. The power output seems to match with your data, but we don't have a sense of what the real market for wind power is in Maine. Do you have Power Purchase Agreements for your wind energy or sell directly to ISO-NE at variable rates? Power sales at 0.06 \$/kWh seems to be the price that makes systems of this size financially sustainable. **We sell our power to New Hampshire Electric Coop under a long term agreement. The all-in price – for electricity, RECs, and capacity – is \$126/MWh. This is the price that was needed to make Beaver Ridge work, and back in 2007/2008, this price was only slightly above market. Obviously the market price has dropped since then due to cheap natural gas and falling demand, so the price is higher than the current spot market price.**

Thanks again for a great afternoon on a windy hill. **You're welcome! Feel free to reach out if you have any additional questions.**

- Whitney

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