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**TESTIMONY BEFORE THE ENVIROMENT AND NATURAL RESOURCES
COMMITTEE**

**AN ACT TO AMEND THE LAWS GOVERNING THE DETERMINATION OF A
WIND ENERGY DEVELOPMENT'S EFFECT ON SCENIC CHARATER OF
MAINE'S SPECIAL PLACES L.D. 901**

March 23, 2017

Chairman Saviello, Chairman Tucker, and members of the Environment and
Natural Resources Committee:

My name is Jim LaBrecque and I am from Bangor Maine.

I appreciate the opportunity to testify today in ^{NFA} ~~opposition~~ of L.D. 901.

When embarking on a long term adventure that could have devastating consequences to our environment or our economy, we would be remiss not to extrapolate on projections of where we might end up.

Beware of what you ask for in case you get it. The most important thing we might want to ask ourselves regarding L.D. 901 is, "what will our children be saying about the decisions we made today in 20 years from now.

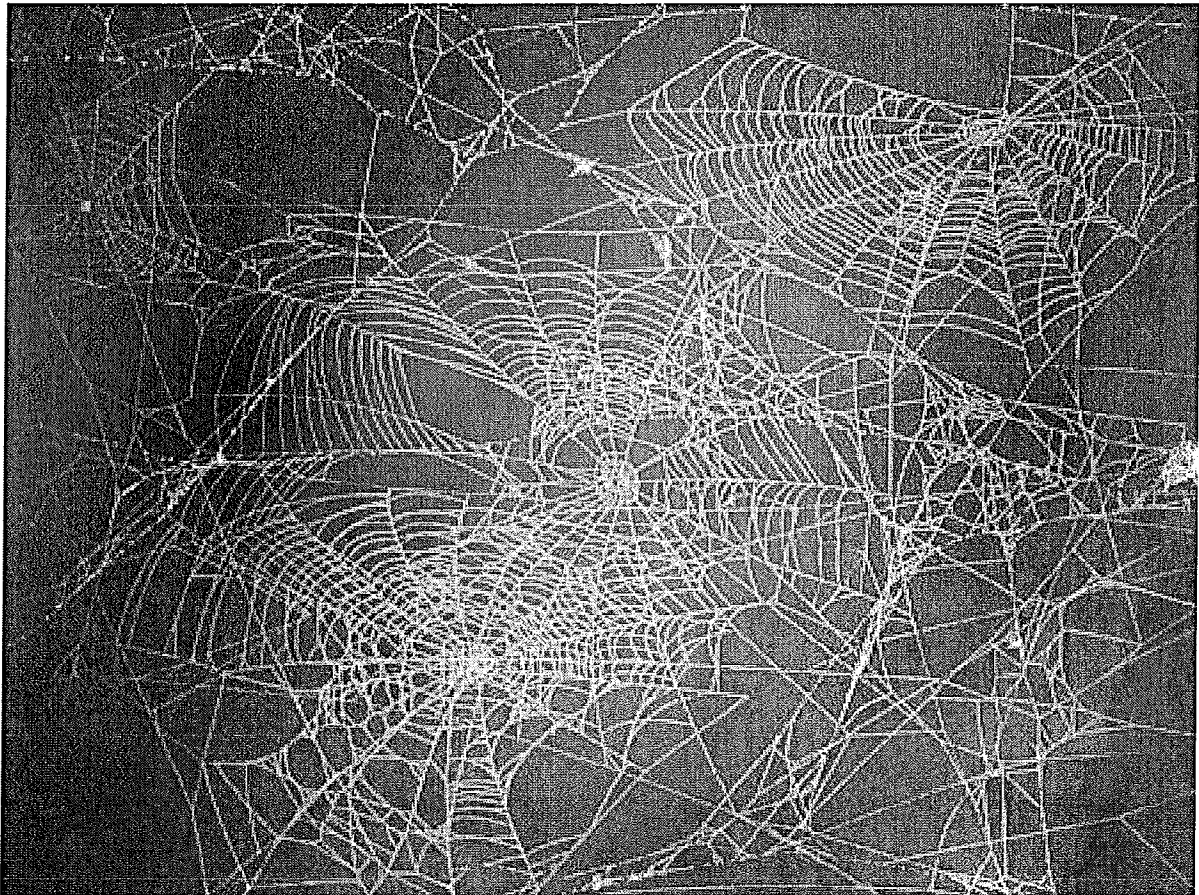
Attached are straight forward energy calculations simply depicting the magnitude of energy we use in Maine to heat homes and what it would take in the form of wind on a design heating day?

The purpose of this exercise is to make aware the relative magnitude of what may be needed of wind to account for any substantial reduction of oil and CO2 in place of oil.

I ask you to look at these numbers in hopes that it may stimulate your thought process in a way that would serve the best interest of the State.

Thank you for allowing me to testify today, and I'm happy to answer any questions that may help you.

**With every mountain top of wind come paths for
transmission and power line distribution**



Purpose

This report challenges any false notion that Maine wind farms will noticeably reduce New England's global warming factor or demand for oil.

Intent

The numbers in this report should educate law makers and the general public on the magnitude of comparable energy units when considering replacing one form of equivalent energy (Btu's from oil) to another form of energy (Btu's from wind).

Recommendation

Wind legislation should strongly consider scenic factors relative to the implications and benefits wind may bring to our State, New England and the globe.

Conclusion

Maine's past legislators failed to weigh the impact on Maine's landscape relating to the trivial positive impact towards the intended goal of reducing New England's global warming factor or its dependence on oil. This comparison must be considered when planning for any future growth of wind.

Jim's Nozzle Factor

This equation calculates the equivalent number of Mars Hill Mountains needed to convert Maine's 434,000 oil heated homes over to electric heat produced by wind turbines when factoring in an average oil burner nozzle delivering .5 gallons an hour at design heating condition. All other factors are linearized based on oil burn rate or quantity of oil based heating systems throughout Maine and New England.

$$\frac{434,000 \text{ homes}}{\text{h home}} \left| \frac{0.5 \text{ gal}}{\text{gal}} \right| \frac{0.8 \times 138,500 \text{ Btu}}{\text{gal}} \left| \frac{\text{kWh}}{3,413 \text{ Btu}} \right| \frac{\text{Mars Hill}}{28 \text{ turbines}} \left| \frac{\text{turbine}}{0.333 \times 1,500 \text{ kW}} \right| = 503 \text{ Mars Hills}$$

	Me.	Me.	N.E.	N.E.
Design Condition Gallons/Hour Burn Rate	.5	.75	.5	.75
Equivalent Number of Mars Hill Mountains	503	755	7,777	11,665
Number of Mars Hill Mountains/Maine County	31	47	486	729
Total Number of 1.5MW Wind Turbines	8,048	21,140	217,746	326,620
Installation Cost	\$42B	\$64B	\$660B	\$990B

Technical Notes:

1. These numbers do not include homes across New England already heated by other means such as wood, propane, natural gas, electric etc.
2. These numbers do not account for commercial, institutional or industrial heat.
3. These numbers do not account for any electricity presently being generated by other means such as hydro, natural gas, coal, nuclear etc.
4. These numbers do not account for power line losses.
5. These numbers do not account for the fact that wind turbines typically shut down at -5F and demand 3% of its output capacity to maintain temperature.
6. 3% of the 326,620 turbines rated output capacity to keep them warm is equivalent to the power of 17 Maine Yankees atomic power plants.
7. When accounting for all the above factors, the total number of Mars Hill Mountain equivalent wind farms can easily exceed 5 times the amount needed to replace New England's home heating oil. That number could easily reach 58,320 Mars Hill Mountains.

Economic Notes:

1. Amortizing 755 Mars Hill mountains over 434,000 Maine homes = \$147,000.00/home
2. This is installation cost only and does not include operation and maintenance, interest, depreciation, overhead, profit etc.

1 Gallon of #2 oil	138,500 Btu
Typical home oil tank	275 Gallons
Typical home oil heat efficiency factor ¹	80%
Number of Maine homes heating with #2 oil ²	434,000
Number of New England homes heating with #2 oil ³	6,710,000
Gallons of oil used by Maine homes/year ⁴	373,240,000
Gallons of oil used by New England homes/year ⁵	5,770,600,000
Typical burner nozzle size ⁶	.75 gallons/h
Average oil demand during design heating conditions ⁷	.5 to .75 gallons/h
Conversion factor for 1 watt of electricity	3.41442595 Btu/h

Mars Hill Wind Farm

Turbine Size	1.5MW
Number of turbines	28
Capacity Factor	33.3%
Cost per/turbine (2006 Dollars)	\$3,035,000.00
Betz Law (Limiting the extraction of energy from wind)	59.3%
Wind turbine theoretical approach to Betz Law	75%

¹ Older heating Systems can be > 70%, new systems can be <90%

² EIA 2010 US Census

³ EIA 2010 US Census

⁴ EIA 2010 US Census

⁵ EIA 2010 US Census

⁶ From interviews with oil burner service technicians

⁷ Assumptions and estimates by James C. LaBrecque