

September 29, 2015

From: Dr. Arthur Hammon, retired science educator
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To: Mr. Timothy W. Drew, Administrator
Public Information and Permitting Unit
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Estimated value of all (40 year) Northern Pass
revenues for Eversource = \$3.14 trillion dollars

Dear Mr. Drew,

I have attended several of the Public Information Sessions concern the Northern Pass project. I am especially interested in the arguments by Eversource that underground burial is not feasible. Both Vermont and Maine seem to be able to accomplish this. I asked at a public session if there were reasons why New Hampshire's geology or landscape made underground burial more difficult than our neighboring states but the engineers were unable to articulate a clear response.

I have since done a "back of the envelope" calculation regarding the commercial value of the electrons which might pass through a 1000 Megawatt line during 40 years. The calculation begins with physical constants and then applies a \$0.01 per kilowatt-hour as the after-expenses profit that would be realized by Eversource. It seems that the return-on-investment of this line, even buried, would be substantial for Eversource. Below is a summary of my calculations:

A 1000 megawatt line carries 1000×10^6 watts per second $\times 3600$ seconds/hour = 3.6×10^{12} watts/hour or 3.6×10^9 kilowatt-hours/hour.

Multiplying this number by 24 hours/day and 365 days/year and 40 years, the number of kilowatt-hours of billable electricity, 3.15×10^{14} kilowatt hours.

After considering expenses and amortizing the cost of construction during this period, an estimated return-on-investment \$0.01/kilowatt-

hour seems a reasonable constant. Using these estimates, the net value to Eversource of the electrons sent through a buried Northern Pass line of 1000 Megawatt over 40 years is $\$3.15 \times 10^{12}$ or \$3.15 trillion dollars.

If, as stated by Eversource officials at the public hearing, that a buried line might cost as much as \$3 billion dollars, that cost is 1/1000th of the revenues that would be realized over the 40 year life of the buried line.

I hope these calculations might prove helpful in the decisions that are to be made. I remain,

Sincerely,

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