

From: Art Hammon [<mailto:arthammon@hotmail.com>]
Sent: Tuesday, January 19, 2016 11:16 AM
To: DES-Info; Drew, Tim; Martin, James
Subject: Calculations regarding Northern Pass

NH Department of Environmental Services
Public Information and Permitting
Mr. Timothy Drew, Administrator and staff

Dear Mr. Drew,

In September, 2015, I submitted (attached) to you a suggested calculation to determine the value of the electrons that would pass through a buried electrical line of the Northern Pass. In your response, you suggested that it might be posted on a DES website as part of public comments. I have not found this website. I was interested to learn if you found my calculations to be correct.

Tomorrow, January 20, 2016, I will be in attendance at a public meeting to discuss the Northern Pass proposal at the Mountain View House in Whitefield. I plan to present my calculations to the assembled group. This calculation was published in the Colebrook Chronicle in October. I have heard no criticism of my calculations so I am assuming my values are correct.

In summary, a Northern Pass buried 1000 Megawatt line at \$0.01 per kilowatt hour (a value that compensates for building and maintenance) in service for 40 years would result in \$3.14 trillion (dollars) of revenue to the electrical provider. The estimated cost of construction has been listed as \$3 billion (dollars). This represents 1/1000 the value of the profit from this electrical line.

Thank you for your consideration of my letter,
I remain, sincerely,

Dr. Arthur Hammon
retired science educator (chemistry/physics)
Whitefield, New Hampshire

***** submitted letter with calculations*****

September 29, 2015

From: Dr. Arthur Hammon, retired science educator
26 Park Street
Whitefield, New Hampshire, 03598

To: Mr. Timothy W. Drew, Administrator
Public Information and Permitting Unit
PO Box. 95
Concord, New Hampshire, 03302-0095

Timothy.drew@des.nh.gov

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 $1/1000^{\text{th}}$ 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,

Dr. Arthur Hammon, retired science educator
26 Park Street
Whitefield, New Hampshire, 03598
arthammon@hotmail.com

"'Tis Education forms the common mind,
Just as the Twig is bent, so the Tree's inclined".
Alexander Pope (1732)

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