

STATE OF NEW HAMPSHIRE SITE EVALUATION COMMITTEE

RE: Joint Application of Northern Pass Transmission, LLC)
and Public Service Company of New Hampshire)
d/b/a Eversource Energy for a Certificate of Site and Facility)

PRE-FILED DIRECT TESTIMONY OF JOHN PETROFSKY

Q: Please state your name and home address.

A: My name is John P. Petrofsky. I am 30 years old and am the fourth generation in my family to reside in Stewartstown, NH. I own the house my parents built themselves in 1972, as well as 85 acres. My primary address is 5347 42nd St. NW, Washington DC, but I spend a significant amount of time in Stewartstown, and I plan to move back eventually if it remains the unique and beautiful place that I grew up in.

Q: What is your interest in the Northern Pass project as proposed?

A: My interest in the project as proposed is in ensuring that the historic resources of the North Country, including those that are or might one day be part of our tourist economy, are not destroyed or degraded by Northern Pass. As I mentioned, I plan to move back at some point, because my business will afford me that flexibility. When I do, I will bring part of that business with me. I can afford to spend time anywhere. I choose to spend time in the North Country specifically because of its deep history, and precious natural resources. I grew up fishing these rivers, wandering its hills, and learning about its history from my ancestors. Northern Pass threatens to destroy everything I hold dear about this place. If Northern Pass as proposed is approved, I don't think I'm ever coming back. I'll take my tax dollars, and my company, somewhere that remains unspoiled.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to highlight concerns surrounding NPT's proposed underground route in Pittsburg, Clarksville, and Stewartstown.

How does NPT propose to mitigate the impact of heat from buried lines both under streams/rivers, and under the roadways?

This is unclear to date. It is not clear that NPT has any firm plans to mitigate the adverse impacts of heat (up to 158 degrees Fahrenheit) which include, heating waterways, and potentially destabilizing the surface of dirt roads? Does NPT have any experience designing such lines in a climate like that of northern New Hampshire? No.

How does the applicant propose to construct the project along the proposed route, given the acknowledged constraints in the NH Department of Transportation Utility Accommodation Manual, as well as the DOE DEIS?

It appears that the applicant is trying to have things both ways. It references the UAM when providing excuses for why certain routes such as Interstate 93 are not useable, but fails to acknowledge that these constraints are more readily apparent on smaller state roads, such as portions of Bear Rock Road. One such condition states that projects must be constructed at the edge of DOT ROWs. The DEIS from the DOE has stated that an area 30-ft wide would need to be cleared to accommodate new construction not within a right of way. As evidenced by the applicant's own submissions, many of the Rights of Way in question are not sufficiently wide to reasonably accommodate this project. Furthermore, the DEIS highlighted concerns surrounding the negative aesthetic impact of necessary additional vegetative clearing. This would be even more the case along rural one lane state roads than along Interstate 93. As Northern Pass stated, "Clearing a 30' wide strip up to 80 miles...long of roadside trees, ledge, and wetlands... through scenic areas poses enormous environmental and aesthetic challenges." I couldn't agree more, and these impacts are no less enormous when inflicted on smaller state roads, in fact, they are worse.

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Q: Why did you buy a home over 600 miles from your primary address?

A: While there is novelty to owning the home I spent time growing up in, my wife and I bought our property because there are few places as unspoiled and beautiful as the North Country, particularly Stewartstown. We wanted a place where we could hike, enjoy clean air and water, and get away from the noise and industrial landscape of the city.

Q: What is your interest in the Northern Pass project as proposed?

A: My interest in the project as proposed is in ensuring that the value of my personal property is not damaged, and that the broader values, including economic values, of the North Country is not diminished by a reckless, poorly thought-out project.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to highlight the negative economic impact of Northern Pass, primarily on the existing and potential tourist and second home economy. My

1 purpose is also to highlight that the purported benefits of Northern Pass are either
2 deminimis, or are better achieved by reasonable alternatives.
3

4 **Why is tourism so important to the North Country?**

5 With the decline of the paper and other wood products industries in the North Country,
6 tourism is the industry. It's the only one left. The transition to a tourism economy driven by
7 small businesses, with the landscape as the backdrop, has been slow but steady, and we are
8 finally making good progress. If Northern Pass is built as proposed it will be a huge setback.
9 People need a reason to keep driving past the White Mountains, the Lakes Region, etc. The
10 reason they do so is for the sense of remoteness and wilderness that you can still get in the
11 North Country. Northern Pass would destroy that aesthetic. I point this out so that you keep
12 in mind the fact that when Northern Pass impairs the beauty of the North Country, it
13 impairs the economy as well.
14

15 **What economic considerations should the SEC take into account?**

16 The SEC should take into account that we are trying to build a sustainable economy
17 centered on the landscape, recreation, and the outdoors. This is a small business economy
18 driven by main street tourist shops, second home owners, vacation rentals, outdoor
19 attractions, etc. Cutting the power bill by a few dollars for a few years won't have an impact,
20 nor will a handful of temporary construction jobs. However, stringing high voltage power
21 lines through some of the most pristine, remote, and scenic areas of the North Country will
22 have a meaningful and long term impact, a negative one, and will impair our best change for
23 orderly economic development. To get a sense of the impacts, I would look at the video
24 testimony submitted by Brad Thompson.
25
26

27 **Why should the SEC take trails into consideration for economic impacts?**

28 The State has expressed that trails should be treated similarly to other infrastructure, such
29 as roads and utilities. [1997 Trails Report, an element of the Statewide Comprehensive
30 Outdoor Recreation Report]. Protection of existing trail corridors is also an expressed goal.
31 "Government agencies...should work together...to protect the scenic value of existing
32 trails..."

33 **Why is the outdoor economy so important?**

34 The loss of timber and manufacturing in the North Country are well-documented. Outdoor
35 industry stands out for its growth potential, and for its growth. The outdoor recreation
36 economy grew roughly 5% from 2005 to 2011, during a time when many sectors
37 contracted. This could be a very promising area of growth for the North Country,
38 particularly the Great North Woods. {SCORP 2013-2018 Ch. 1}. The North Country is
39 obviously well-suited to building an outdoor industry, but its open space and beauty are

underutilized. For example, the Cohos trail is the only long-distance hiking trail north of the White Mountains. That makes protecting the experience along the Cohos Trail that much more important.

Can hiking trails like the Cohos really lead to meaningful economic development?

Yes. One in three Americans hike [Washington State report]. The outdoor industry is nearly a \$1tr industry. The average national park visitor spends between \$43 and \$63 per day. (Washington State Report). Similar trails in the White Mountains have seen steady growth (23% increase over 26 years), (See 1997 trails report.) Demonstrable interest in the Cohos Trail is growing.

What is the measurable economic impact from trail use?

Studies have shown meaningful economic impact from trail use. One study quoted up to \$1.2MM per trail annually. On a per user basis, we have numbers ranging from \$25.14 per hiking-trip related expense per person, to \$67.23 in the White Mountain National Forest (1997 Report). More recently, reports have shown overnight guest expenditures per party per trip in New Hampshire for hikers and backpackers to be over \$580. That's what we need more of north of the White Mountains. Resource like this are important to the North country because they are durable (not going away unless the trail experience diminishes), and recurring. As noted above, there is less of a boom-bust cycle to outdoor recreation, something the North Country sorely needs. The Cohos Trail is the only major hiking trail (enabling extended hiking for several days), north of the White Mountains. It could form the backbone of a much greater trail network in the future. If people are going to come all the way up to the North Country, we can't give them hiking trails alongside power lines. Why bother?

What are some of the broader benefits of outdoor recreation?

Leisure and Hospitality has grown near 6% annually for the last few years, and growth appears to be accelerating. Coos, Grafton, and Carrol Counties are more dependent on this sector than the rest of the state (7% of the overall economy vs. 4% for New Hampshire broadly).

Why are second homes important to the North Country Economy?

The Economic Impact of Open Space in New Hampshire (1999): attributed direct income from second homes: \$478,783,000. Attributed state and local tax revenues: \$285,855,786mm.

What does this mean for town like Clarksville, and Stewartstown? The seasonal home economy is very important. The statewide average for percentage of homes that are seasonal is 10%. In Stewartstown it is 53%, in Clarksville 69%, and in 73% in Pittsburg! There are roughly 1276 second homes in Pittsburg, 303 in Clarksville, 490 in Stewartstown, 19 in Dixville, 52 in Millsfield, 155 in Dummer, 195 in Stark, 52 in Groveton, 139 in Lancaster, and 268 in Whitefield for a total of 2,949 in the Coos County towns along the applicant's proposed route alone. Adjusting the Open Space Report's numbers for inflation, we get an estimate of \$693mm in direct income from second homes, and \$414mm in local tax revenues, annually. We can see that \$32mm of direct income and \$19mm in local tax revenues could be impacted, annually. Again, this is only Coos County.

How does NPT impair economic resources like hiking trails, second homes, and scenic roads?

Natural beauty is clearly one of, if not the most important criterion in selecting outdoor recreation sites. This is particularly true in the North Country. In fact, the draft EIS noted almost the entire proposed route in the North Country as having High or Very High intrinsic visual Quality. On a related note the North Country Chamber of Commerce conducted a survey about how to drive the economy going forward. A few things from this survey stand out. Over 95% of visitor respondents said they came to the North Country for either outdoor recreation or entertainment/pleasure. 70% of visitor respondents visit often. In response to what local services Visitors use while visiting, the second highest response (64%), was Sightseeing, followed closely by Scenic Drives (59%). 57% of visitors had household incomes above \$75k. There is real economic potential here.

Looking at just a handful of scenic and outdoor recreation resources, we can quickly see what kind of impact Northern Pass would have. You can get a sense of this broadly by going to page 546 of DOE's Visual Impact Assessment. Negative visual impacts are widespread, and severe. I will go over several important scenic and cultural resources that are the backbone of our nascent tourist economy. As bad as each of these individual impacts is, the collective impact is worse. Northern Pass would impair the scenic value of the North

Country left and right. It's not just one or two views. It seems to be almost every view.

Bear Rock: Bear Rock overlooks the Bear Rock Valley between Holden Hill and South Hill, and helps to define the natural beauty that lends Bear Rock its strong identity and sense of place. The line as proposed would partly envelop Bear Rock. The line and Transition station #4 as currently proposed would entail blasting in the immediate vicinity of Bear Rock, including its lower slopes. The Cohos Trail currently passes directly to the south and west of Bear Rock. Look at the DOE's Visual Impact Assessment SE 1 to get a sense of the visual change. Also note that Bear Rock is not shown on this map, despite repeated attempts to convey its location to DOE.

Keith Haynes Snowmobile Trail (Route 18/5): one of the first snowmobile trails in the region, and a critical North-South connector. People travel long distances to experience a wilderness-like setting, and the snowmobile season is a major economic driver for the North Country. The lines would be plainly visible from the trail, and in fact cross the trail near the Heath Road, strongly diminishing that sense of place. The overhead line also comes close to, and may cross route 127/18A. The underground portion of line on Bear Rock Road would run under route 21, and may disrupt that route in the winter. There are likely additional crossings up and down the North Country. In the Chamber of Commerce survey nearly a quarter of all respondents came to the region for snowmobiling.

Diamond Pond Road: The drive from route 26 to the Diamond Ponds is incredibly scenic (you should travel it if you haven't already). The line as proposed would cross the road and be visible for miles from it. This road is the gateway to the Diamond Ponds, renowned for their trout fishing experience, and a hub for snowmobilers in the winter. The popular SnoDeo is an annual snowmobile fair and very important tourist event that occurs on Big Diamond. As important as the fishing is the sense of remoteness one encounters while fishing. The route as proposed crosses Diamond Pond Road. At several points along the road tourists would see between 20 and 40 transmission towers. Not only that, but portions of the line would be visible from the Ponds themselves.

Sugar Hill: The highest point in Stewartstown. The line as proposed would go over the summit of Sugar Hill, close to 3,000 ft., with an obvious scenic impact not just in Stewartstown and Colebrook, but also from the backcountry of Dixville, and the

unincorporated townships, again, destroying the sense of remoteness that people come north to experience. Note that at this point the line would be only a few hundred feet from conservation land on either side. The towers would be visible from many places in the backcountry because they are proposed to run right over the summit of 3,000 ft. mountains. There are places not far from the road in Millsfield where you would see over 50 towers. This is in areas that today are nothing but forest.

Nathan Pond: a pristine backcountry pond. The line passes close by, and instead of a backcountry experience, you would see 5-10 transmission towers. Nathan Pond is also on the Cohos Trail.

Coleman State Park: One of the gems of the State Park system. You would see at least 40 towers on the drive in, while the present view is of nothing but historic farms and forest. The line will also be visible from the Park itself.

The Cohos Trail: Hiking trail running the length of Coos County. It has been instrumental in getting increased attention from hikers to the area north of the White Mountains. A key part of the appeal is that this is a wilderness trail, otherwise why keep driving past the Whites? The line as proposed would cross the Cohos Trail at least three times in Stewartstown alone, and at each crossing every hiker would see between 5 and 20 towers. In addition, the trail passes within feet of Transition Station 4, which would be highly visible. Additionally, construction of underground portions of the line would disrupt and potentially block the Cohos Trail where it is co-located along Bear Rock Road. Further south, on portions of the trail in Stark near the Kauffman Forest, you would see between 5 and 40 towers in various places. Why would hikers come north of the White Mountains to look at towers at so many points along the trail? They wouldn't.

Route 145: Part of the Connecticut River National Scenic Byway. This is an incredibly scenic view, and one of the two gateways to Pittsburgh. For over a mile of this road there would be up to 20 towers visible, as well as a transition station. This would ruin an iconic North Country view.

Route 3: I have the same concern as route with Route 145. These two roads function as the gateways to Pittsburg, a major "wilderness destination", and an engine in our economy. Near the Pittsburg-Clarksville border there would be at least 5-10 towers visible, and two transition stations.

1

2 *Other Conservation Areas / Parks from which Northern Pass would be visible include:* The
3 Balsams easements, the approach to Hurlbert Swamp, the Washburn Family Forest, and the
4 Vicki Bunnell Preserve. There are likely others that I'm overlooking.

5

6 Historic Cemeteries: As elsewhere in New England, Stewartstown, Pittsburgh, and
7 Clarksville have historic cemeteries that add to the sense of place, are beautiful in their own
8 way, and serve as a draw for tourists. Several of these would be negatively impacted in
9 various ways. From "Abandoned Cemetery" (it's name) on Old County road, the view is
10 currently bucolic, across fields out over the Connecticut Valley. If Northern Pass is
11 approved, you would also see at least 20 transmission towers. Even worse, both
12 Abandoned Cemetery and North Hill Cemetery would be impacted by underground
13 construction, used by Northern Pass because it couldn't find a real right of way. This
14 proposed construction would alter the character of what are currently pristine rural
15 settings, and is against state law because it would necessarily take place within 25 ft. of
16 cemeteries and known burials. In the case of Abandoned Cemetery, there are actually
17 burials underneath the road.

18

19 Keazer Farm Bed & Breakfast: This is an example of a local business that would be
20 impacted by Northern Pass. The Bed and Breakfast is situated on rolling hills with
21 extensive hayfields (several hundred acres), and sweeping views. Those views would
22 become a liability as upwards of 40 towers would be visible from this location. Why would
23 anyone choose this establishment going forward?

24

25 **Why would anyone buy a vacation home anywhere in New Hampshire if Northern**
26 **Pass is approved as proposed?**

27 No well-informed person would. If Northern Pass is approved as proposed it would be
28 proof that New Hampshire has no respect for private property rights or its own incredibly
29 important tourist economy. It would be proof that a well-connected company can run
30 roughshod over state laws and the clear public interest. Most importantly, it would be
31 proof that nothing is sacred, and that at any moment any public resource could be
32 sacrificed for private gain. Why buy a vacation home in New Hampshire if you can wake up
33 any morning and be facing the prospect of 40 transmission towers staring back at you from

1 what used to be a view? If Northern Pass is approved as proposed, the prospect for a
2 healthy second home market is deeply impaired, as is the public trust.

3 **What factors should we focus on when examining the purported benefits of NPT to**
4 **NH?**

5 We should ask ourselves are the benefits meaningful (no) do they outweigh the costs (no),
6 and are the purported market benefits likely to materialize in the absence of the proposed
7 project (yes). Allow me to explain.

8
9 **Does NPT actually offer cost benefits to the grid over emerging technologies?**

10 No. Comparative analysis of LCOE for various generation technologies suggests that large
11 scale hydro will not be competitive against either solar PV technologies or onshore wind in
12 the near future. In fact, PV and onshore wind already have superior LCOE in many
13 instances. NPT is proposing to negatively impact our tourist economy while saddling the
14 New England Grid with un-competitive assets.

15 **Is the Market Case that NPT presents a realistic case?**

16 No, they don't factor in the ongoing improvement in wind (8% annual cost reductions), and
17 solar PV (10-15% annual cost reductions). If and when NPT is ever completed, it will
18 already be uncompetitive. LCOE for wind is currently 5-6 cents/kWh. For solar PV it is 5
19 cents/kWh to 9 cents/kWh, with the high end including the cost of storage to address
20 intermittency. While firm figures from NPT are elusive, Hydro Quebec has contracted with
21 Vermont at 6cent/kWh, and the cost of Hydro Quebec's incremental generation is
22 estimated to be somewhere around 10 cents/kWh. Is NPT cheaper than gas? Perhaps, but
23 the market benefits that NPT lays out are likely to be achieved without this project ever
24 being constructed, because there is even lower-cost generation out there.

25
26 **Is NPT's analysis time frame reasonable?**

27 No. The cost-benefit analysis examines an 11yr. period, while the project's expected life is
28 40 years. If all the benefits are exhausted by year 12, then this project should be
29 immediately rejected, because the costs will continue for at least 40 years.

Does NPT offer the host communities any positive economic value?

Assuming NPT's wholesale energy market savings numbers are correct, is this a sufficient benefit to outweigh the costs?

No. NPT estimates that they will save NH \$8.2M-\$10.2M per annum. This amounts to \$6.18-\$7.45 per resident of the state. That's basically a somewhat fancy hamburger. Is Northern Pass worth a fancy hamburger? No. Remember, that's before factoring in the costs, which last forever. Wholesale load reductions per person might give us another \$6. Fries and a drink?

By Northern Pass's own admission, retail energy savings peak in 2023. Is this enough to warrant allowing this project to go through?

No. That's six years from now, and three to four years after this project expects to enter the market. If the benefits peak 3 years into a 40-year project, that's a terrible tradeoff for the people of New Hampshire. The costs last at least 40 years, and probably longer. Furthermore, as you can see in NPT's own analysis, in 2026 NPT begins to have a net **negative** impact on retail electricity costs.

How should we weight the uncertainty benefits ("Insurance Value") of NPT? (Summer and Winter price spikes)

The volatility of the NE grid is certainly something worth addressing, but Northern Pass is not the only way to do this. Again, solar PV and onshore wind have superior LCOE. They are better able to address cost spikes going forward. Demand exceeding 90/10 expectations has occurred only 6 times in the last 23 years. With demand in ISO-NE expected to continue declining over time, this is not a serious enough concern that we need to go to Northern Pass. Better projects are already being approved. (New England Clean Power Link). Furthermore, while natural gas price volatility is a concern, the expected improvements in solar PV and onshore wind LCOE is sufficient that these assets will be cost competitive with gas-fired assets in the near future, if not already. In fact, NPT cites cost spikes as high as \$529/MWH. Luckily rooftop solar PV unsubsidized is now \$150/MWH, and utility solar PV and onshore wind are just above \$50/MWH. According to the Oak Ridge Laboratory, the median LCOE for new hydro projects is \$110/MWH.

What about the need for more baseline power, when the sun doesn't shine and the wind doesn't blow?

Again, using NPT's doomsday scenario of \$529/MWH, we can project that solar and wind still have a favorable profile. Lithium ion energy storage has an LCOE currently on the low-end of \$321/MWH. NPT isn't the only solution. In fact, NPT isn't a good solution. NPT is taking power from Hydro Quebec, whose reliability is historically very questionable. For example, Hydro Quebec failed to deliver power to Vermont for 66 days following the ice storm of 1998.

If Northern Pass is going to be uneconomic soon after it's completed, what is anyone worried about?

Northern Pass does not have to be profitable to have negative consequences. If Eversource abandons Northern Pass, it will still be a scar running up and down our state impacting tourism and the environment. We need to make sure NPT has more than sufficient funds set aside to decommission this project. Northern Pass is trying to sell our neighbors a lemon, and they want to park it in our yard.

Are there economic benefits to underground lines?

Aside from avoiding the costs that I have laid out, and countless others that I am sure you will hear about, there are a few additional benefits to fully burying power lines.

The first is more resilience in the case of natural disasters. Again, recall that Hydro Quebec failed to deliver power to Vermont for 66 days following the '98 ice storm.

Secondly, security should be a huge concern. Recent events such as the Metcalf Substation Attacks have laid bare just how vulnerable the grid is to terrorism. Northern Pass's proposed line is 180 miles long, and cuts through terrain that in some places is sparsely populated. It is vulnerable to the kind of attacks we have seen recently. Furthermore, Northern Pass is widely reviled in New Hampshire. It's not out of the realm of possibility that Northern Pass becomes the favorite target practice of a few angry New Hampshire citizens. What use is a transmission line that goes down every deer season? Again, burying the line would eliminate this potential problem. (evidence of hatred of Northern Pass = the preponderance of pre-filed testimony).

1 Finally, as you are well aware, New Hampshire has a pre-approved underground energy
2 corridor that could be utilized tomorrow. In this instance, New Hampshire would share the
3 revenues with the transmission developer. That would be the kind of project the State
4 should support. Instead of approving Northern Pass as proposed, the SEC should make
5 using the underground corridor a condition of approval. If Northern Pass doesn't want to
6 use it, we can probably find a transmission developer who would.

7
8 **Is NPT's power more affordable than other currently proposed alternatives anyway?**

9 Not likely. While we don't have firm numbers for NPT's LCOE, Hydro Quebec's impact
10 assessment put the cost of their recent Romaine development at 9.2 cents/kWh, or
11 \$92.00/MWH. That is nowhere close to competitive with even the current LCOE for solar
12 PV and onshore wind, let alone what these resources will look like in four years. Hydro
13 Quebec did recently sign a deal with Vermont at 6 cents/kWh, but this is still problematic
14 for two reasons. First, is it really sustainable for HQ to sell power below cost? Second, these
15 prices are still above the median prices for solar PV and onshore wind, (near 5 cents/kWh).
16 Going forward, the best generation for the state will be wind and solar (and increasingly
17 just solar because of the faster expected cost declines, -10-15%, vs. -8%). Combine solar
18 and wind with batteries, expected to fall in cost by 50% in the next few years, and it's not
19 clear that NPT's power is even a good option (not with li ion batteries near 15-20
20 cents/kWh, and likely to be much cheaper by the time Northern Pass would be ready. Some
21 estimates put the battery pack costs of the new Tesla Model S at \$150/kWh. If that's true
22 then by 2020, we might reasonably see costs of \$100/kWh, and a LCOE equivalent of under
23 5 cents/kWh, depending on cycle frequency. Northern Pass looks increasingly uneconomic
24 only four years from now, so why should we approve it and incur decades of cost on our
25 tourism economy?

26 Furthermore, Quebec is a winter-peaking system, and Hydro Quebec's ability to offer much
27 help in colder weather may be limited anyway. Hydro Quebec has not offered peaking
28 supply in the past, so why should we expect it to do so going forward? If Northern Pass is
29 approved and completed, it won't be the most cost efficient or reliable way to power the
30 New England grid.

31
32 **Solar PV and Wind may be better than Northern Pass on cost, but are they likely to**
33 **materialize?**

1 Yes. ISO-NE currently has 4GW of wind in its interconnect queue. Even given ISO-NE's
2 unrealistic assumptions regarding Solar PV growth (they have revised their projections
3 upward every year), we can assume another 1.3GW of Solar PV in the next three years.
4 ISO-NE annual peak demand is slightly higher than 24GW, and has been declining for
5 several years. Add in emerging storage mandates (600MW so far), and demand that is
6 expected to continue declining, and we see that non-gas, non-hydro, cost-competitive
7 solutions amounting to nearly 25% of ISO-NE demand is currently expected in the next few
8 years. Given cost declines in solar, wind, and storage, the actual number will likely be
9 higher.

10
11 **NPT notes that new additions to the grid have declined (as of 2014), is this still a**
12 **concern?**

13 Less so. Again, note the expected Solar PV and wind additions. These have a favorable
14 cost/benefit profile to Northern Pass. NPT's basic analysis is now old by several years, and
15 stale given the rapid improvement in competing technologies.

16
17 **Are the local economic impact analyses presented by the applicant still valid?**

18 This is a point of concern. In its analysis, LEI pointed out that transition project costs are
19 allocated the three states participating in the 3 state Clean Energy RFP. Who will bear these
20 costs now that NPT has lost that RFP? Who will bear the costs if NPT loses the
21 Massachusetts RFP? How will this impact the supposed energy savings for New
22 Hampshire? These are all questions that need answering by the applicant.

23
24 **Why is there such a disconnect between NPT's cost/benefit analysis and the realities**
25 **of the energy options available to us?**

26 Time. When NPT was first proposed in 2008, and even up until a few years ago, many of the
27 claims made seemed reasonable. However, the alternatives to Hydro Quebec have evolved
28 rapidly. The cost of solar PV has fallen nearly 90% since 2008. The cost of onshore wind
29 has fallen 40%. When NPT was proposed, it was cost competitive against these
30 alternatives. By and large, that's no longer seems to be the case, and will certainly not be so
31 2-4 years from now, when NPT proposes to begin operation.

1

2 **Can the claim of competitiveness be grounded on the notion that Combined Cycle Gas**
3 **Turbines are the most cost competitive alternative available?**

4 No. Again, look at the LCOE now, and factor in the rate of cost decline anticipated for
5 emerging technologies. Gas generation has relatively low capital costs, but higher fuel costs.
6 Solar PV and Wind, by comparison, have higher capital cost (relative to total cost), and
7 essentially no fuel cost. That's why you should look at LCOE. Again, Solar PV and Wind are
8 currently cheaper than gas, and getting cheaper every day. NPT is setting up a strawman by
9 comparing itself against gas only. Furthermore, the arguments presented surrounding the
10 reliance of the New England grid on gas are mitigated by the very real prospect that wind
11 and solar pv will start displacing not just coal, oil, and nuclear over the next 5-10 years, but
12 also gas, and yes, hydro. It's just a matter of cost.

13

14 **Is NPT the best way to achieve its purported reductions in greenhouse gases?**

15 No. Again, more cost-competitive solar and wind assets also have superior profiles in terms
16 of reducing greenhouse gases. This is because NPT power will come in part from new
17 hydro-projects in northern Quebec. The flooding of forests actually creates methane and
18 CO2 emissions. Methane is a worse greenhouse gas than CO2. In this sense the reservoirs
19 creating power for NPT might actually be worse for the climate than the gas combined
20 cycle plants they purport to be replacing. NPT needs to fully disclose how much methane
21 and CO2 will be released from the reservoirs supply Hydro Quebec's dams.

22

23 **Are local GDP benefits meaningful?**

24 No. NPT estimates a \$214mm increase in GDP during the construction phase, or \$156 per
25 person, once. Again, the costs last forever. The jobs created peak at roughly 2,500 four
26 years after the project begins. After 2026, NPT's own analysis expects it to have a
27 NEGATIVE impact on jobs in NH.

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Q: What is your interest in the Northern Pass project as proposed?

A: My interest in the project as proposed is in ensuring that the historic resources of the North Country, including those that are or might one day be part of our tourist economy, are not destroyed or degraded by Northern Pass. As I mentioned, I plan to move back at some point, because my business will afford me that flexibility. When I do, I will bring part of that business with me. I can afford to spend time anywhere. I choose to spend time in the North Country specifically because of its deep history, and precious natural resources. I grew up fishing these rivers, wandering its hills, and learning about its history from my ancestors. Northern Pass threatens to destroy everything I hold dear about this place. If Northern Pass as proposed is approved, I don't think I'm ever coming back. I'll take my tax dollars, and my company, somewhere that remains unspoiled.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to highlight damages to natural resources, including

those originating from the project, as well as inadequacies in the mitigation plan.

What are the threats to natural landmarks?

It bears mentioning it again, because NPT refuses to acknowledge its existence, that the location of transition station four puts Bear Rock at risk. Bear Rock is a local natural landmark (also addressed in my Historical testimony). NPT is proposing blasting and large changes of grade directly adjacent to, and including the lower slopes of, Bear Rock. This is not appropriate, and not necessary. It's a defacement of a local natural landmark. Would you allow something like this at the base of the Franconia Cliffs, within sight of the Flume, or next to the Madison Boulder? No, you would not, and Bear Rock should be no different.

What are the threatened wildlife?

Other than aquatic resources (addressed in my wetlands comments), the primary threats appear to be from habitat fragmentation. The North Country is not the limitless wilderness of some people's imaginations, and there is limited habitat left in a suitable condition to support several of the state's species of concern. Of particular note are the Bicknell's Thrush and pine marten, which are highly reliant on high-elevation spruce-fir forests, and the Canada Lynx and Spruce Grouse, which both depend on both high and low elevation spruce-fir forests. The species also depend on unfragmented habitats.

What are the threatened ecosystems and habitats?

NPT proposes to clear a path through unfragmented forest blocks, including blasting for tower foundations and underground portions of the line. State-defined habitats of greatest conservation need impacted by NPT's route include Northern Upland Watersheds, Montane Watersheds, High-Elevation Spruce-Fir Forest, Lowland Spruce-Fir Forest, Northern Hardwood-Conifer Forest, Grassland, Cliffs, Marsh and Wet Meadows, and Rocky Ridges and Talus Slopes.

Many of these habitats are rare to being with, and spruce-fir forests have been in continual decline for most of the past thirty years. Northern Pass would clear and fragment significantly more of these forest habitats.

What are the posed to habitats?

Northern Pass as proposed would cause harm to wildlife in two ways, first by damaging the habits listed above directly, through clearing and blasting.

Secondly, and perhaps more importantly, Northern Pass would cause significant fragmentation of these habitats. The transmission line would cut through habitat that is not only significant, but also large and connected. Northern would go through the middle of what are currently some of the state's largest unfragmented forest blocks. If the project proceeds as proposed, the habitat and conservation values that result from unfragmented forests will be impaired.

What are the threats posed by a loss of connectivity?

Unfragmented forest blocks are considered the most important value for wildlife habitat by New Hampshire Fish and Game. Large blocks of unfragmented forestland provide wildlife with buffers from negative human impact, both direct (hunting, car collisions, habitat destruction, and indirect (invasive species, edge vs. interior species). Blocks greater than 10,000 acres represent the best scale to ensure that ecological structure, function, and processes have sufficient framework to foster true ecological stability over time. Northern Pass would run through several of the largest blocks of unfragmented forest left in the state, basically dividing (fragmenting) them, and severely impacting their wildlife value.

Species like the Canada Lynx and the Spruce Grouse depend on large, unfragmented habitats. Spruce Grouse are easily hunted and easily mistaken for ruffed grouse, and are thus highly dependent on remote settings for survival. Anything that makes their habitat more accessible to humans increases the likelihood of accidental harvest. Furthermore, spruce grouse are a deep-forest bird, and large clearings cutting through the forest make spruce grouse more susceptible to predation to species like coyotes. Canada Lynx likewise are wide ranging predators, and further fragmentation of their habitat not only makes them more susceptible to inadvertent trapping, but increases competition from coyotes.

What other negative impacts result from increased forest fragmentation?

Furthermore, increasing fragmentation impairs the conservation value of the land through which Northern Pass would be built. The NPT route through Dixville is essentially surrounded by conserved land. This land would be the lynchpin of one contiguous conserved landscape which could in turn, support a much expanded tourist economy if the focus of landowners shifted from exploitation to sound forestry coupled with an outdoor recreation economy.

What are the threats posed by damage to habitats?

Bicknell's thrush depend on intact high elevation forests. When these forests experience clearing, Bicknell's Thrush appear to suffer from competition from other species. NPT as proposed would clear high elevation spruce-fir forests above 2700 ft. There is a reason that this is against state proscribed best-forestry practices, and needs Coos County Planning board permission.

Why is the mitigation plan inadequate?

NPT has proposed to use as mitigation parcels of land on which the transmission line is proposed to be constructed. This land is effectively impaired through fragmentation, habitat alteration, etc. NPT should set aside additional parcels that are not impacted by the line for any mitigation should the project go through. However, no amount of supposed mitigation can truly compensate for the loss of habitat that would result from this project. For example, NPT proposes to fragment some of the few large forest blocks greater than

1 10,000 acres that are left in the state. There is no way to offset this impact.
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3 **Why does it appear that most of Northern Pass's preferred route through 40 miles of**
4 **new right of way goes through habitat that has been identified as "most valuable in**
5 **the State", "most valuable in the ecological region", or "supporting landscape"?**

6 It appears that way because it does. Northern Pass as proposed amounts to a massive new
7 impact to habitat that has been till now largely intact, and because of it, incredibly valuable,
8 not just for wildlife, but for the economy that relies on it, and the natural heritage of our
9 state. Northern Pass has elected to string their power line through some of the most
10 pristine parts of New Hampshire. They would have been hard pressed to pick a more
11 damaging route if they tried.
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