Introduction and Qualifications

Q 1. Please state your name, business address, and affiliation.

A 1. My name is George E. Sansoucy. My business address is 7 Greenleaf Woods Drive, Unit 2, Portsmouth, New Hampshire 03801. I am the owner of George E. Sansoucy, P.E., LLC.

Q 2. Describe your educational background and professional qualifications to appear in this proceeding.

A 2. I have a Bachelor and a Master of Science Degree in Civil Engineering and I am a Registered Professional Engineer in New Hampshire, a certified general appraiser in New Hampshire, and a certified assessing supervisor by the NH Department of Revenue Administration. My firm, George E. Sansoucy, P.E., LLC, provides valuation, consulting and engineering services to clients throughout the United States. The firm's two primary services are 1) consultation services on energy and regulatory matters involving the public and private utilities sector in the United States, and 2) the valuation of public utility infrastructure, energy projects, and complex industrial properties. Over the years, I have testified in legal and regulatory proceedings in New Hampshire and elsewhere before state and federal courts and administrative agencies throughout the United States, including the Federal Energy Regulatory Commission, the Nuclear Regulatory Commission, and the NHPUC.

I have previously attached my resume as Exhibit 1.

Q 3. Do you have additional testimony on underground impacts? What areas of testimony are you providing related to your review of the testimony referenced above?

A 3. My supplemental testimony to my December 30, 2016 testimony is primarily related to the following items:

1. Economic Benefit – Frayer, Shapiro
2. Construction Related Impacts, Underground Construction and Overhead Construction
3. Economic Benefits – Shapiro, Chalmers
4. Orderly Development – Varney, Chalmers (including tax on Chalmers)
5. Aesthetics, Visual Screening and more as we go

Purpose and Summary

Q 4. What is the purpose of your testimony?

A 4. The purpose of my testimony is to represent and express the technical opinions and concerns regarding the construction of Northern Pass in New Hampshire in total as well as specifically for and in the towns of Northumberland, Whitefield, Littleton, Sugar Hill, Franconia, Woodstock, Plymouth, Ashland Water & Sewer, Bridgewater, Bristol, New Hampton, Concord, Pembroke, Easton, and Deerfield. Additionally, the purpose of my testimony is to express my disagreement with the Northern Pass testimony before the Committee regarding the above listed subject matter.

Exhibits

Q 5. Have you sponsored exhibits in this case in your previous testimony?

A 5. Yes. The 32 exhibits listed below were filed with my November 15, 2016, December 30, 2016, and March 24, 2017 testimony.

EXHIBITS SPONSORED NOVEMBER 15, 2016:

- Exhibit – 1: Resume
- Exhibit – 2: USPAP 6 & Preamble
- Exhibit – 3: NH State Standards for utility taxation
- Exhibit – 4: Photo of Hydro Quebec Phase 1 and Phase 2
- Exhibit – 5: FERC Form 1 - New England Electric Transmission Corporation, and New England Hydro-Transmission Corporation 2015/Q4
- Exhibit – 6: FCA #10
- Exhibit – 7: Ventyx Documents (CONFIDENTIAL)
- Exhibit – 8: Google Earth Map

EXHIBITS SPONSORED DECEMBER 30, 2016:

- Exhibit – 9: NH Alternative Route Map
- Exhibit – 10: Northeast Energy Link Map
- Exhibit – 11: Qualification in the Forward Capacity Market
- Exhibit – 12: 2016 CELT Report

- Exhibit – 13: Maine Governor's Energy Office I-95 Legislation
- Exhibit – 14: Portland Natural Gas Transmission Map
- Exhibit – 15: Chalmers Professional Studies Table
- Exhibit – 16: Chalmers Subdivision Table
- Exhibit – 17: GES's Rev. Req. Table & FERC Opinion 531-A
- Exhibit – 18: Interconnection Request Queue
- Exhibit – 19: NE Spring 2016 Reference Case Report (CONFIDENTIAL)
- Exhibit – 20: NE Fall 2016 Power Reference Case Base Results (CONFIDENTIAL)
- Exhibit – 21: Forecasted Energy Margin – NPT Table
- Exhibit – 22: Champlain Hudson Power Express Summary
- Exhibit – 23: PPLC Operating Performance 2007-2015 (PPLC FERC 2015)

EXHIBITS SPONSORED MARCH 24, 2017:

- Exhibit – 24: Hydro Quebec Phase 2 Drawing and Photo
- Exhibit – 25: ISO New England – FCA-11
- Exhibit – 26: Maine Power Express
- Exhibit – 27: New England Clean Power Link
- Exhibit – 28: New England Clean Energy RFP
- Exhibit – 29: Proposed & Winning Clean Energy Projects & Transmission Line Maps

- Exhibit – 30: 15-459-2016-10-14 Order – 25953 Granting NP PU Status
- Exhibit – 31: 15-459-2016-06-10 NPT Settlement Agreement
- Exhibit – 32: News Articles

Q. Are you sponsoring new exhibits with this Testimony?

A. Yes. I am sponsoring the following exhibits:

- Exhibit – 33: Transmission Service Agreement and Financial Risk
- Exhibit – 34: Revenue Requirement and Cash Flow Analysis
- Exhibit – 35: Chalmers Reference
- Exhibit – 36: Underwood Analysis
- Exhibit – 37: Tax Card Diminution Table
- Exhibit – 38: Combined BTLA Cases
- Exhibit – 39: Granite State Power Link Information
- Exhibit – 40: New Hampshire RSA Chapter 162-H

Testimony

Q 6. In your supplemental testimony herein, which is supplementing your December 30, 2016 Track 2 testimony, whose testimony are you referring to and rebutting?

A. 6. I am rebutting and supplementing testimony related to the following witnesses and subject matters:

- The Julia Frayer testimony as supplemented and amended, including the amended London Economics Report and the new workpapers provided within the last several weeks. Her updated testimony is dated February 15, 2017 and March 17, 2017;
- James Chalmers pre-filed testimony dated October 16, 2015, report dated June 30, 2015, the data requests and responses from Orderly Development Panel Tech Sessions, including those related to Mr. Chalmers;
- Pre-filed direct testimony of Lisa Shapiro dated October 16, 2015, with Appendix 44 Northern Pass Transmission Project – estimated New Hampshire property tax payment reports; and
- Forward New Hampshire Plan submitted to many of the towns along the route.

Q. 7. What information have you reviewed and what testimony have you reviewed to support your additional supplemental testimony regarding the witnesses mentioned above?

A. 7. I have reviewed the following information provided in this case:

- Original pre-filed direct testimony of Julia Frayer dated October 16, 2015;
- Original report of Julia Frayer and London Economics dated October 16, 2015;
- Updated testimony of Julia Frayer dated February 15, 2017;

- Updated report of Julia Frayer and London Economics dated February 15, 2017;
- Updated testimony of Julia Frayer dated March 17, 2017;
- Un-redacted revised report of London Economics and Julia Frayer dated March 17, 2017;
- Confidential supplemental documents submitted by Julia Frayer dated March 2017;
- 2016 CELT Report with Appendix A-F;
- FCA-11, including the list of power plants that were selected;
- Supplemental pre-filed testimony of Kenneth Bowes dated March 24, 2017 including the Burns & McDonnell Cost Report;
- Summary of the New England Clean Energy RFP bids and awards;
- RFP for long term contracts for clean energy projects dated March 31, 2017 issued by the Massachusetts Department of Energy Resources;
- NPT-DIS Bates #031446 Coos Loop;
- Forward New Hampshire Plan;
- Posting of March 9, 2017 by Northern Pass;
- Actual Line Sheets relative to the lines that traverse the Town of Ashland Wastewater Treatment lagoons;
- BTLA decisions regarding property taxes;
- Docket No. 15-459 PUC Order 25,953 dated October 4, 2016;

- Docket No. 15-464 Order 26,001;
- Revised photo simulations of the Northern Pass rights-of-way;
- Reference RSA Chapter Section 162H:1 New Hampshire RSA's on Energy Facility Siting Council;
- The New Hampshire Department of Transportation's April 3, 2017 documenting anticipated conditions to be issued with the permit;
- Pre-filed testimony of Earl C. Bascom dated December 30, 2016;
- Review of notes and minutes of the 4/7/2017 telephonic tech session of Earl Bascom; and
- Public documents regarding the Granite State Power Link by New England Power Company which utilizes the existing Hydro Quebec Phase I and Phase II line and rights-of-way in New Hampshire.

Q. 8. Before beginning, are there any issues prior to your testimony regarding the witnesses, that you wish to respond to which have developed from the two tech sessions regarding your previous testimony?

A. 8. Yes. First, criticism has been raised regarding my opinion as to the Site Evaluation Committee's responsibilities in this matter specifically as it relates to alternatives and the public interest. I would like to call the Committee's attention to New Hampshire RSA Chapter162-8:7, Application for Certificate, section V(b), which requires the applicant to identify both the applicant's preferred choice and other alternatives that it considers available for the site and the configuration of each major part of the proposed facility, including the reasons for the applicant's preferred choice. As such, it is my opinion

that the applicant is required to present alternatives, not just incidental alternatives of moving the line here or there within the primary choice, but real bonified alternatives, such as those alternatives that I have provided in my testimony. If the applicant fails to identify such alternatives, I believe it is a responsibility of the SEC to request that the applicant provide this information, or seek different alternatives. Otherwise, as we know from the testimony of Northern Pass representatives, Northern Pass has neglected to identify bonified alternatives and/or has essentially given lip service to any potential competing alternatives to its currently proposed transmission line. In the absence of the relevant alternative analysis provided by the applicant, I have identified and provided information to the SEC of bonified alternatives to Northern Pass for their consideration. It is my opinion that the SEC should require the applicant to consider alternatives.

Secondly, committee members of the SEC are from the Public Utilities Commission, the Department of Environmental Services, the Department of Resources and Economic Development, the Department of Cultural Resources, the Division of Historical Resources, the Department of Transportation, and the public. With the exception of the public member, each of these department heads come to the SEC with a public interest standard and responsibility from their respective agency. In addition, the SEC itself has a public interest responsibility. It is clear that, under Chapter 162-H:16, Findings and Certificate Issuance, Item IV(e), that in considering the issuance of a certificate and related terms and conditions thereof, it must serve the public interest. Based on Chapter 162-H:16, I reiterate my testimony that the SEC has a public interest responsibility and, in evaluating the proposal of Northern Pass project it must consider other alternatives and

the needs of the public in the State of New Hampshire. As I have stated previously, I've been doubtful of the applicant's claim that the New Hampshire ratepayers bear no risk in the construction, development, and cost reimbursement of The Northern Pass Project. It is noted that Mr. Quinlan, President and COO of Public Service Company of New Hampshire, in these proceedings has revealed that these scenarios exist whereby New Hampshire ratepayers will be responsible for Northern Pass costs. As such, we renew our belief that the SEC should stop these proceedings at this time and mandate a complete and thorough re-review of Northern Pass's claims, the alternatives, the need, and mandate that Hydro Quebec testify before this body relative to its intentions in this matter. Also, the SEC should re-review the Northern Pass PPA, require clear and definitive facts about how much capacity Hydro Quebec actually has and will dedicate to Northern Pass on a firm basis, and the firm tariffs that it is willing to pay.

Q. 9. In general, what are your concerns regarding the company's proposal to construct Northern Pass as proposed, and the analysis (as revised and supplemented) by London Economics?

A. 9. In general, the applicant and London Economics has continuously failed to adequately justify and explain the need to open a new energy corridor in the State of New Hampshire.

Q. 10. What are your general concerns with London Economics' report as to the feasibility and economic benefits of the Northern Pass Project?

A. 10. London Economics and Julia Frayer of London Economics have failed to consider the alternative proposals facing Northern Pass in New England, the effect of competition from these proposals, and the impact that competition may have on the economics of the Northern Pass Project.

Q. 11. What additional areas do you believe London Economics has failed to properly consider and/or evaluate relative to the Northern Pass Project's economic feasibility?

A. 11. London Economics has failed to prepare a correct and detailed revenue requirement to be used in calculating a proper tariff. Had this analysis been properly completed, it would reveal that the Northern Pass tariff will ultimately be too high to be economically feasible. I have conducted an analysis of Northern Pass's revenue requirement, and energy/capacity requirements. This analysis was conducted consistent with the applicant's FERC filing Docket Number ER11-2377, and is represented in several exhibits. The first exhibit is a collection of Northern Pass submittals to the Federal Energy Regulatory Commission, as well as the FERC's decisions in these matters. This exhibit includes the original submission for approval of the Transmission Service Agreement and the approval of a transmission tariff. This filing includes a request for approval rate of a 12.56% return on equity. The return on equity required is made up of a base return plus incentives/collars. The final decision allowed for a capital structure and of a 50% debt/50% equity debt and a return on equity of 12.56%. This decision was immediately

appealed by a number of parties as being excessive, including the Attorney General for the State of Massachusetts which filed an omnibus complaint regarding the excessive transmission tariffs in New England. The omnibus complaint filed in 2014, included herein as an exhibit, noted that NSTAR and other subsidiaries of Northeast Utilities were issued equity rates very near those included in the Northern Pass filings. The testimony between the companies, FERC, and the various States was replete with discussion and demonstration of the risk involved in building market based electric transmission facilities in the United States and New England and was to provide the justification for the high returns on equity and the equity adders. These testimonies, by both Northeast Utilities and its subsidiaries, to the local regulators are in direct contradiction to the applicant's claims and its contention that Hydro Quebec will cover all costs associated with the Project. Julia Frayer also maintains that there is no risk to the applicant or the New Hampshire ratepayers because Hydro Quebec is going to pay for everything. Finally, Mr. Quinlan has testified that he can't envision a scenario where the New Hampshire ratepayers would be at risk. In fact, Mr. Quinlan and other applicant witnesses have repeatedly insisted that their investment in Northern Pass will be recouped from Hydro Quebec regardless of if/when/and to what degree the project is utilized or even operational. Essentially, they insist that there is no risk to themselves, their shareholders, or their ratepayers. This begs the question: why does the applicant argue for a collar to the FERC approved return on equity because of the project's risk, while turning to local regulators and the SEC and claiming no risk? In my view, the facts in this case are simple for the SEC. FERC believes that companies throughout the region have substantially

proven that there is significant risk in the construction and ownership of major importing transmission lines serving the region, and that additional return on equity incentives are required to compensate these utilities for this risk. The ratepayers pay ultimately all costs related to these lines in one fashion or another. It is therefore incumbent on the SEC to move carefully, with a very non-political skepticism of the benefits and true risks of Northern Pass in the face of the significant impacts to the State, the people, land values, aesthetics, etc. It's one thing to feed the State of New Hampshire with a DC spur, and cross the border into our own transmission system for our own needs. It's quite another to be the host of a significant line into New England that may likely become socialized for the benefit of other states, at the cost of New Hampshire ratepayers, taxpayers, and citizens.

Q. 12. in your analysis, have you estimated what you believe to be the minimum transmission tariff that will be necessary to charge for the use of this transmission line?

A. 12. Yes. We have calculated in Exhibit 34 a minimum transmission tariff based on the applicant's revenue requirement worksheets submitted to the FERC in docket ER11-2377. We have input current cost of the project, $1.6 billion, the approved returns on equity, established debt rate, etc. We have then prepared a table which presents an estimate of the breakeven (gross margin per kWH) transmission tariff that will be required based on the capacity factor of the Northern Pass Project. Northern Pass cannot and will not possibly operate at a 100% capacity factor. The lowest possible transmission tariff will be to spread the entire annual revenue requirement over all hours at full capacity. That is

an impossible situation to achieve. As it is, our existing power plants very often are light loaded at night, and our nuclear plants must operate at full capacity 24 hours a day. The best possible scenario, considering our existing fleet of electric generation plants, hydroelectric plants, renewable energy, and nuclear plants, is that Northern Pass would transmit at its full capacity during the peak hours of the day, during the peak months of the year. For purposes of this exhibit and analysis, I believe that Northern Pass would operate, at best, in the 5 by 16 block (5 days a week, 16 hours per day) of 5 days, 16 hours per day less holidays, classified as the peak period of time by the New England ISO for peak summer and peak winter months and not the shoulder months. Peak months will be June, July, August, and September with shoulder months of October and November, and again peaking months in December, January, February, March and shoulder months being April and May. Mathematically, the realistic capacity factor would include the transmission of power over the proposed Northern Pass transmission line for 16 hours a day, five days per week, or 80 hours per week (16 hours X 5 days = 80 hours/week) during the peak months. As noted, peak months include 8 of the 12 months of the year, or 66% (8 months ÷ 12 months) of the year. The resulting capacity factor is 31% (((80 hours per week X 52 weeks = 4,160 hours per year) ÷ 8,760 total hours in a year = 47% of the year) X 66% of the year = 31% capacity factor). For purposes of our analysis, and considering that no plant or transmission line will operate at its full capacity all of the time, I believe that the highest operating recurring capacity factor, under normal conditions, is likely to be only 30%. As such, the Sansoucy revenue requirement analysis presented on Page 4 of Exhibit 34, columns H through M, assumes a capacity factor 30%.

Q. 13. What capacity factor did Julia Frayer include in her analysis?

A. 13. Julia Frayer's testimony and the London Economics report relied upon nearly an 83% capacity factor. This level of capacity factor defies all economics of the New England Grid System. It would require the plant to run essentially 365 days per year, for all months, for all hours, and provide 17% time for shut down and appropriate responsible maintenance of the transmission system and converters, as well as the hydro turbines in Canada and substations. It is my opinion that this level of generation is simply not going to happen in New England based on the current fleet of generation, and the demand profiles of our New England system.

It is important to note that this revenue requirement, i.e., capacity costs, are required before any additional revenue is available in the marketplace to pay for electricity.

Q. 14. Have you prepared a projection of the price of electricity and compared that to a projection of the fixed costs and potential available revenue for the energy being delivered by Hydro Quebec on the Northern Pass line, and if so, what is your opinion from this analysis?

A. 14. Yes. I have prepared a projection from Ventyx of the market price of electricity and capacity to support this line over the next 20 years. This is provided in Exhibit 34. My conclusions from this analysis and projection are that the seller (Hydro Quebec) of electricity flowing via Northern Pass would have to pay a firm capacity commitment of $81.84 per kW-year in its actual first year of operation (2020) for the tariff necessary to support Northern Pass and only achieve market sales, based on a

30% capacity factor, of $240,147,647, $81,877,153 less than the annual revenue requirement.

Q. 15. On the economic liability of Northern Pass, have you prepared an exhibit of the total revenue to be received by Northeast Utilities for the ownership of Northern Pass over the next 40 years, the proposed depreciable life of the plant?

A. 15. Yes. I have prepared a regulatory capitalization discounted cash flow model which models and simulates the total revenue requirement and cash flow generated under the regulatory compact and federal tariffs that will be allowed to be supported for Northern Pass. Put a different way, the total amount of cash flow the applicant will receive through rates for Northern Pass at the proposed cost of $1.6 billion.

Q. 16. What is the summation of your findings in the regulatory capitalization model that you have prepared as Exhibit 34 Page 1?

A. 16. My findings reveal that the applicant will realize total cash flows of approximately $6.4 billion. When adjusted for time, the present value of cash flows over the 40 year life of the project is $2,474,514,496, or a ratio of 1.55 of the cost of the project.

Q. 17. Are you sponsoring exhibits related to the revenue requirement and likely tariffs for Northern Pass under the proposed construction scenario?

A. 17. Yes. Exhibit 34 Pages 2 and 3 are a revised revenue requirement for Northern Pass. This Exhibit is prepared in accordance with the original revenue requirement proposed by the Company in FERC Docket ER11-2377, when the cost

was $1.1 billion. The next part of the Exhibit shows the inputs and the current revenue requirement that will be necessary for $1.6 billion cost. The revenue requirement is, in general, the capital structure, the return on equity, the return on debt, the federal income taxes, state income taxes, the total return, all fixed operating costs, and, in the case of Northern Pass, variable operating costs. The revenue requirement sum total is provided as part of Exhibit 34 Page 3, Line 18, which reveals a revenue requirement of $322 million for the year for the 1,090 MW proposed line. This is up from the original revenue requirement for Northern Pass of $219 million proposed by the Company in 2010 with an in service date of January 1, 2016.

Q. 18. In year one, what is the cost per kilowatt to support the revenue requirement of $322 million?

A. 18. In year one, 2020, under the Frayer proposal of an 83% capacity factor, Frayer and London Economics is suggesting the plant will operate and transmit 7.958 billion kilowatt hours of electricity per year. The fixed tariff alone supporting the revenue requirement, with the earnings rate of 12.56% on equity, requires $4.05/kWH at an 83% capacity factor as the hurdle rate just to buy transmission capacity via Northern Pass. If the real capacity factor, under the Frayer proposal, is half of the 83%, then the actual hurdle rate required per kilowatt will rise to $8.10 /kWH before any payment for energy.

Q. 19. Previously you have testified that you believe the realistic capacity factor and utilization of the Northern Pass line will be on peak during the peak months of the year, and not full time on an off peak during all months of the year. What capacity factor do you believe is likely, based on the generation mix in New England and the economic dispatch of the transmission line by the New England ISO?

A. 19. As stated previously, I believe that the realistic capacity factor will be 30%, at best, if this line were to be built, under the current economic conditions. The problem with a 30% capacity factor is that it raises the delivery price to $11.20/kWH just to cover the hurdle rate for the capacity in the line in year one of operation. This amount of fixed capacity price per kilowatt is equal to the construction of a new coal plant - it is that expensive. The cost per kilowatt year is $295 to support the Northern Pass proposal at $1.6 billion to construct, and a reduced capacity to 1,090,000 kW (1,090 MW). This hurdle rate must be achieved for the price of energy and capacity before any additional price can be paid towards the price of electric energy from Hydro Quebec. Absent legislative intervention, we believe the market cannot support Northern Pass at $11.20/kWH, nor can it support $7.49/kWH, and it is highly unlikely that it can support $3.75/kWH.

Q. 20. FCA 11 was bid in February of 2017. What was the price per kilowatt month for FCA 11?

A. 20. FCA 11 was approximately $5/kW month, $60/kW year as the market price of capacity that will be paid to the line.

Q. 21. What is the price per kilowatt month of Northern Pass with your capacity factor?

A. 21. The price is $25/kW month, or 5 times higher than FCA 11. FCA 11 is less than FCA 10.

Q. 22. Have you prepared, using Ventyx, a forecast of the capacity prices going forward that would be paid to Northern Pass, and the energy prices going forward that would be realized in the marketplace for New England East?

A. 22. Yes, I have, and have provided them as Exhibit 34 Page 4.

Q. 23. Please explain Exhibit 34 Page 4 and the conclusion drawn from this analysis.

A. 23. Exhibit 34 Page 4 shows the capacity price forecast by Ventyx for the estimated first year of operation, 2020, through 2041. The Ventyx prices are issued in real dollars and have been converted to nominal dollars with an inflation rate of 2.5%. The Frayer 83% capacity factor and the Sansoucy 30% capacity factor actual realized capacity prices per kilowatt hour delivered are shown in Columns N-S and Columns H-M, respectively. The next step in the Exhibit is to add the projected energy price in the marketplace which is anticipated to be the market clearing place for the purchase of electric energy. In the case of Frayer's electric energy, it would be forecast as all hours, both on and off peak, to achieve her 83% capacity factor. In the case of Sansoucy's, it is the on peak pricing at a 30% capacity factor. These two are also inflated by 2.5% to convert from real dollars presented by Ventyx to nominal dollars for this analysis. In Exhibit 34 Page 4, the Sansoucy projection is in green and the

London Economics projection is in orange. In the Sansoucy projection, the gross margins are negative from 2020 to 2026, or a period of 7 years. They then go marginally positive until approximately 2035, and then continue to escalate from 2035 to 2041. On the other hand, using the London Economics proposed criteria, the gross electric margin is positive in the first year and remains positive, and grows, all the way to 2041. In the case of the Sansoucy projections, it is unimaginable that Hydro Quebec will ship electricity into the United States at the rate of 2.8 billion kilowatt hours per year, at a financial loss for 10 years. Under my realistic capacity factor and dispatch scenario for Northern Pass, Northern Pass is economically not feasible to construct, and not feasible for Hydro Quebec to participate in. The Sansoucy forecast, even when the gross margin per kilowatt turns positive in 2027, only rises to 6.6 cents per kilowatt hour by 2041. It remains in the 1-, 2-, and 3-cent range for gross margin available to Hydro Quebec. This demonstrates, using realistic forecasting and capacity factors, that Northern Pass is not feasible without government subsidies. I don't believe the Site Evaluation Committee is charged with the responsibility to recommend government subsidies as part of its finding of the public interest and the approval of a project. The 83% capacity factor projected by London Economics and used in Ms. Frayer's analysis, is unrealistic especially with the nuclear plants operating in the region. The gross margin per kilowatt based on the 83% capacity factor is 1.67 cents per kWh to start and escalates slightly over 10 years to 3.50 cents per kWh by 2027. By 2041 the gross margin per kWh reaches only 8.50 cents per kWh. The return on investment for Hydro Quebec, considering that it has to fund $600 million worth of

improvements to get the electricity to the New Hampshire border, makes no sense in these price ranges, and I believe that Hydro Quebec, at best, would only dump excess off peak electricity if it had it to dump.

Q. 24. In your previous testimony, you included a discussion of FCA 10, the Forward Capacity Auction for New England ISO. At this time FCA 11 is available. Have you considered FCA 11 for this supplemental testimony?

A. 24. Yes, I have. FCA 11 is provided herein as Exhibit 25. The capacity payments under FCA 11 have dropped to $5.30 per kW month from FCA 10's $7.03, or from $84.36 kW year to $63.60 kW year to 2021. This reduction has an impact on the feasibility of Northern Pass and represents a 24.6% reduction in potential capacity revenue. The very conditions of providing additional capacity into New England from Northern Pass that are intended to save ratepayers money by reducing capacity rates throughout the region in and of itself hurts Northern Pass by reducing revenue to Northern Pass. Where Eversource has always claimed that Northern Pass will be a merchant transmission line, they have also claimed it will reduce capacity prices in New England. These claims are internally inconsistent in regards to the feasibility of Northern Pass.

Q. 25. Do you have additional concerns regarding the Chalmers report and subsequent Underwood report included in the Chalmers report regarding the impact on the property value of the proposed Northern Pass line?

A. 25. Yes. I am sponsoring three (3) additional exhibits and supporting documents outlining my continued concerns regarding the Chalmers report, as well as the Underwood report which Mr. Chalmers has relied upon. These exhibits are:

- Exhibit 35 is the Chalmers analysis
- Exhibit 36 is the Underwood analysis
- Exhibit 37 is the Tax card diminution table

The impact of Northern Pass on surrounding property values occur based on the activity of Northern Pass, the market, and market perceptions at the time that it's occurring. The Chalmers report is dated, irrelevant, and duplicative. I have prepared Exhibit 35 which is an analysis of all of the reports that have been referenced by Chalmers and that he ultimately summarizes to indicate that there is no impact. It appears to be a substantial amount of public information and data regarding the issue of property value. It is a regurgitation of a bibliography of articles that are extremely old, and are in and of themselves used by the writers of the articles that Chalmers himself is then referring to. Put another way, Chalmers refers to articles that refer to the same articles within the articles. In order to demonstrate this, I have prepared a list of all of Chalmers' reports and our research on each and every article that we were able to find referenced in Chalmers' work. For example, report number 1 referenced in the Chalmers' report is the tower lines and residential property values. In Column B, the author, Kinnard, and the voltage are not indicated. That report references 15 articles. Those articles are dated and the oldest goes back to 1953, or is 64 years old as of today. The market has substantially changed in 64 years. Nearly all of the articles

referenced, and therefore then used by Chalmers in report number 1, are dated from 1953 at the earliest to 1964 at the latest. Furthermore, the voltage is not indicated. It is very important to note that the Chalmers report provides impacts based on voltages that are not comparable to Northern Pass. This lack of comparability in the Chalmers report is so significant and important in the analysis as to rise to the level of being disingenuous. The overwhelming majority of the articles referenced in the Chalmers report, and shown in our research in Column D, as to what voltages were in each of these articles indicates that the vast majority of the voltages are less than the 300,000 volt DC line which is being proposed for Northern Pass. A number of articles are unavailable and cannot be located or verified that they exist. Of the 25 reports referenced, research indicates that more than half of them are at voltages lower than the Northern Pass voltage, and nearly three quarters only have portions as high as Northern Pass. In Column E of Exhibit 35, all of the articles that are the source of the information used by the author of the article and referenced by Chalmers are listed. For the first time that an article is used by one of the authors, it is listed in black. The year of the article is provided and is marked in yellow so the SEC can very quickly look at the dates, and determine for itself the relevance of these older articles on the marketplace in New Hampshire at this time for lower voltages predominantly. Every article that is referenced a second time by a subsequent article reference and considered by Chalmers, is reported in red. If the article is duplicated, the report number that Chalmers uses to reference his information is shown in Column F. A number of articles were unavailable and could not be located and researched and,

therefore, could not be corroborated as fact, based on Chalmers representation. These are shown in gold, and include articles 4, 5, 6, 7, 11, 13, 14, 15, 16, 19, and 24. Eleven out of 25 articles in Chalmers' report, or 44% of his source documentation cannot be located, verified, or corroborated. Each of the articles that cannot be independently verified should be ignored by the SEC. That leaves only 14 remaining articles. Of those 14, one can see by scrolling through the pages of my Exhibit 35, that as the reader gets deeper into the articles, more and more red titled articles, used by the author of the article and chosen by Chalmers, gets greater and greater, i.e., the duplication of the same article being used by a different author continues to grow. By the time one gets to article 12 by Hamilton and Schwan, referenced by Chalmers, it is a literature search and report of 13 articles of which are now red and duplicated in previous articles. Some are duplicated as many as 6 times in Chalmers' report. For the SEC trying to make a decision, this is fundamentally bad reporting and demonstrates bias. As one gets further in my Exhibit, to Page 5 and Page 6, nearly all of the articles are duplicative. The report title for each of the articles is enclosed, and in the case of articles 20, 23, and 24, Chalmers is citing to his own articles as an additional article. I believe this is inappropriate reporting which misleads the reader. The last portion of the Chalmers Exhibit is a flow chart of the Chalmers report. The flow chart shows the primary report dated June 30, 2015 in green, which was provided by Northern Pass to the SEC. The inputs to this report that Chalmers wants the SEC to rely upon, are themselves reports authored by Chalmers in 2012, and the detail of those is provided in the previous charts that show the duplication of much older articles

used by Chalmers. It is essentially a regurgitation of something that was regurgitated in the first instance. Referenced reports that Chalmers wrote, that he has brought in and used, referenced herein as 20, 23, and 24 on the previous pages of this Exhibit, show substantial duplication, in red, of the articles within those reports. Report 23, for example, is a literature search in the western United States of 7 articles, of which 5 have been regurgitated and reused by others already referenced by Chalmers, and only 2 are new. One is nothing more than a newspaper clipping. Report 24 cannot be independently verified, although referenced by Chalmers, and 20, predominantly from the 1980's and the 1990's, is stale dated. The square boxes show citations from other reports, authored by others, and duplicated in the Chalmers' reports which are brought into the green circle, namely the primary Chalmers report. The gray boxes are two reports used by Chalmers, report 21 and 22, authored by Jackson, that itself uses Chalmers report, number 20, as well as 21 citations authored by others, and then used in the Chalmers original report. It's a duplication and reduplication of the same information, all of which is stale dated, very hard to substantiate, and irrelevant. Mr. Chalmers' report includes and appears to consider or rely upon the Underwood study report referenced in and included in the Chalmers report.

Q. 26. Do you have additional concerns of the Underwood Report?

A. 26. Yes. The Underwood study, referenced by Chalmers and included in his report, is a study of 50 sales and the impact of those sales, and their view on the proximity to a transmission line. The sales used included transmission lines throughout the state. Exhibit 36 is a table which actually summarizes the individual

sales and the information in each of those sales. The sales in the Underwood report are provided only in a narrative analysis per sale, but they are not summarized so that the reader can visually see the impact of each of them in a concise configuration. You can see the difference in price is Underwood's representation of the impact on the difference between the listing price and the sales price for that sale. Underwood then goes on to offer his own opinion as to whether or not the sale was affected or unaffected by high voltage transmission lines. In Column T of my table I used a red amount in parentheses, wherever, in the sales selected by Underwood, the price paid was less than the relisting sales price. We have included the various notes and summary from Underwood for the reader to see to observe the entire study in one table. As one can see in Column T, the overwhelming majority of the sales are at less than the relisting price, and averaged approximately a $31,000 reduction per sale. The most recent listing prices vs. the sale price spread of $31,262, found on Line 54, on Page 2, represented a diminution of approximately 13.2% of those sales which were less. The Underwood study more correctly corroborates the findings of the Sansoucy analysis related to the assessment impact by the Towns and Cities notated on the tax assessment cards for the impact of high voltage transmission easements.

Q. 27. Are there Board of Tax and Land Appeals cases in New Hampshire which have considered the impact of high-voltage transmission lines on the value of property?

A. 27.Yes. A sample of cases are the following and are provided as Exhibit 38:

- William G. York, Carl R. York, and Paul W. York v. Town of Charlestown (Docket No. 5459-88)
- William Lepsevich & Bernadette Lepsevich v. Town of Goffstown (Docket No. 5466-88)
- David E. Corbit & Judith M. Corbit v. Town of Goffstown (Docket No. 5556-88)
- Alice C. True v. Town of Alton (Docket No. 6249-89)
- Robert & Barbara Smith v. Town of Wentworth (Docket No. 6291-89 & 9269-90)
- Richard & Joan Bossart v. Town of Merrimack (Docket No. 7693-89)
- Thomas & Jean Story v. Town of Merrimack (Docket No. 7771-89)
- James & Joanne Rogers v. Town of Cornish (Docket No. 10828-90 & 10987-91)
- Shirley & Rudolphe Daigle v. Town of Candia (Docket No. 11371-91PT)
- Estate of Robert J. Bonin v. Town of Rye (Docket No. 111651-91PT)
- Margaret & James Farrenkopf, Sr. v. Town of Campton (Docket No. 12736-91PT)
- Phillip & Elsie Traxler v. Town of Antrim (Docket No. 15030-94PT)
- Lockheed Sanders, Inc. v. Town of Hudson (Docket No. 15346-94PT & 17233-96PT)
- Anne Krantz v. Town of Amherst (Docket No. 15830-94PT)

- James & Margaret Smith v. Town of Windham (Docket No. 16544-95PT)
- Charles & Diane Interbartolo v. Town of Piermont (Docket No. 17834-98PT)
- Bruce Connell v. Town of Londonderry (Docket No. 24811-09PT)

Q. 28. What new alternative proposals have already been announced since your last testimony?

A. 28. In addition to all of the proposals in process listed in my previous testimony, a new proposal, called the Granite State Link, has been proposed by National Grid and New England Power Company which is intended to utilize and upgrade their existing high-voltage DC line from Canada to Massachusetts and offer a competing proposal to Northern Pass. Exhibit 39 provided herein is an overview of this new line. Exhibit 39 also includes a map of the new line and this line follows the same corridor and is the same line proposed in our initial testimony of 11/15/2016 as Hydro Quebec Phase I and Phase II and found on the map in Exhibit 8 as the green and yellow line. National Grid is proposing to update and modify this line to carry an additional 1,200 MW of power from the Canadian border to Massachusetts through the existing Hydro Quebec Phase I and Phase II line and energy corridor. We reiterated again in our testimony of 12/30/2016 with updated information our concern that Northern Pass had not proposed to use the existing corridor with National Grid and instead is seeking to go it alone and open a new energy corridor in New Hampshire. Our continued concern is a new energy corridor in New Hampshire is not needed, at this time, and the company has not demonstrated that it is needed.

Q. 29. Do you have additional testimony on underground impacts?

A. 29. I'd like to draw your attention to the draft approval issued by the New Hampshire Department of Transportation addressing and corroborating our original testimony and indicating the likelihood of additional underground construction impacts and requirements, including those outlined in my previous testimony.

Q. 30. Does that conclude your testimony?

A. 30. At this time, yes.