

STATE OF NEW HAMPSHIRE  
BEFORE THE  
PUBLIC UTILITIES COMMISSION

<b>ORIGINAL</b>	
N.H.P.U.C. Case No.	DG 14-380
Exhibit No.	#16
Witness	Panelli
<b>DO NOT REMOVE FROM FILE</b>	

In the matter of

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities

Docket No. DG 14-380

Petition for Approval of Firm Transportation Agreement

DIRECT TESTIMONY

OF

Dr. Pradip K. Chattopadhyay  
Assistant Consumer Advocate/Rate and Market Policy Director

May 1, 2015

1 **Q. Please state your name, business address and occupation.**

2 A. My name is Pradip K. Chattopadhyay. My business address is 21 South Fruit Street,  
3 Suite 18, Concord, New Hampshire. I am employed as the Assistant Consumer Advocate/Rate  
4 and Market Policy Director with the New Hampshire Office of Consumer Advocate (OCA).

5 **Q. Please describe your formal education and professional experience.**

6 A. I have a Ph.D. in Economics from the University of Washington, Seattle, which I earned  
7 in 1997. I have also taken courses in City and Regional Planning with applications to Energy  
8 Planning from Ohio State University in 2001-02. I have taught several courses in economics at  
9 the University of Washington as an instructor and adjunct faculty at its Business School. I am  
10 also associated with the Southern New Hampshire University (SNHU) as an adjunct faculty,  
11 where I teach several courses in economics.

12 From March 1998 to October 1999, I was a consultant with the National Council of  
13 Applied Economic Research, New Delhi, India. From November 1999 to August 2001, I was  
14 the Economist at the Uttar Pradesh Electricity Regulatory Commission (UPERC) in India, and  
15 advised UPERC on tariff issues. From September 2001 to June 2002, I worked at the National  
16 Regulatory Research Institute, Columbus, Ohio, as a graduate research associate while pursuing  
17 advanced courses in Energy Planning in the City and Regional Planning Program at Ohio State  
18 University. From June 2002 to July 2002, I worked at the World Bank, Washington D.C. as a  
19 short-term consultant/intern with its Energy and Water Division.

20 I worked at the New Hampshire Public Utilities Commission (Commission) from August  
21 2002 to January 2007 in the capacity of a utility analyst. My responsibilities at the Commission  
22 as an analyst were in electric utility issues including analyzing and advising the Commission on

1 rate design, cost of capital issues, wholesale market issues, and other regional matters. I briefly  
2 worked at the Massachusetts Department of Telecommunications and Energy (later reorganized  
3 into Department of Public Utilities (MA-DPU)) starting in January 2007 as an Economist. At  
4 MA-DPU, I represented the staff and examined gas demand estimation and forecasting,  
5 decoupling issues, and environmental remediation matters. I returned to the Commission in June  
6 2007 to join its Telecom Division as its Assistant Director, and continued in that position until  
7 December 2010. I was also helping other divisions as an expert witness in economics-related  
8 issues as well as advising the Commission on regional electric matters including FERC  
9 jurisdictional issues. I joined the Commission's Regional Energy Division in January 2010 as  
10 the Regional Energy Analyst, and was advising the Commission in that capacity until I joined the  
11 Antitrust and Utilities Division, Office of the Minnesota Attorney General, in August 2013. I  
12 came back to New Hampshire in March 2014 and worked as an individual consultant until the  
13 end of August, 2014, representing the Minnesota Attorney General. I joined Liberty Utilities at  
14 the end of August, 2014 as a Forecasting Analyst for its Energy Procurement Department. I  
15 worked with Liberty Utilities for about three months, before starting my own consultancy firm.  
16 In December 2014, I joined the OCA as its Rate and Market Policy Director. I was later  
17 appointed the Assistant Consumer Advocate.

18 **Q. Have you previously provided testimony before this Commission?**

19 A. Yes.

20 **Q. In which dockets did you provide testimonies before this Commission?**

21 A. I provided testimony before the Commission in the following dockets:

- 1 • DE 03-200 – rate design testimony which was about delivery rates for retail
- 2 ratepayers of Public Service of New Hampshire (PSNH);
- 3 • DE 06-028 - cost of capital testimony which was also about PSNH’s delivery rates;
- 4 • DT 07-027 – competition testimony in retail telephony;
- 5 • DG 08-009 - cost of equity testimony which related to gas delivery rates of National
- 6 Grid NH;
- 7 • DE 09-035 - cost of equity testimony in the matter of electric distribution rates.

8 **Q. Have you ever provided testimonies and affidavits before other Commissions?**

9 A. Yes. I have testified on cost of capital before the Minnesota Public Utilities Commission  
10 in dockets G008/GR-13-316 and GR 13-617.. I have also provided an affidavit before the  
11 Federal Energy Regulatory Commission in a FERC Docket ER 09-14-000 on NSTAR’s petition  
12 for ROE incentive adders on behalf of the New England Conference of Public Utilities  
13 Commissioners (NECPUC).

14 **Q. What is the purpose of your testimony in this proceeding?**

15 A. The purpose of my testimony is to report the OCA’s findings and position on Liberty  
16 Utility’s (Liberty or the Company) petition to the Commission requesting approval of  
17 EnergyNorth’s Precedent Agreement (PA) with Tennessee Gas Pipeline Company, LLC  
18 (“TGP”) for firm transportation capacity on TGP’s proposed Northeast Energy Direct (“NED”)  
19 pipeline. Liberty’s proposed PA is for 115,000 Dth per day for twenty years beginning 2018.  
20 Liberty proposes to replace EnergyNorth’s existing Concord Lateral contracts at Dracut with the  
21 new PA proposed in its petition. EnergyNorth seeks the Commission’s review of the PA and  
22 approval of its resource decision in this proceeding.

1 **Q. Please summarize your testimony?**

2 A. The primary focus of my testimony is whether or not the capacity contract under  
3 consideration is reasonably cost-effective. Since ratepayers are responsible for costs associated  
4 with such contracts, it is incumbent upon the company to demonstrate that the capacity contract  
5 in question is reasonably cost-effective from a ratepayer's perspective. My testimony therefore  
6 examines whether or not the Company has adequately demonstrated the cost-effectiveness of the  
7 PA contract. Based on the Company's testimony and responses provided by the Company to  
8 data requests, I find that the Company has not adequately demonstrated that the contract in  
9 question is reasonably cost-effective. I also explain that the reasonable level of capacity for the  
10 proposed PA contract is likely to be well below 115,000 Dth per day. Finally, I discuss what the  
11 Company is required to do to determine the reasonably cost-effective level of NED capacity that  
12 should be placed under contract.

13 **Q. What is the Company's position with respect to its proposal of contracting 115,000**  
14 **Dth per day with NED?**

15 A. The Company's response to data request OCA 1-11 (Attachment PKC-1) states, "the  
16 Company believes that it has demonstrated in its testimony that the 115,000 Dth per day of  
17 capacity contract with NED is appropriate and required to satisfy its firm sales customer  
18 requirements for the 20-year period of the contract".

19 **Q. Do you agree with the Company that it has demonstrated that the 115,000 Dth per**  
20 **day capacity contract with NED is appropriate?**

21 A. No.

22

1 **Q. Please explain why?**

2 A. First, I disagree with the Company's characterization of what is an appropriate contract.

3 The appropriateness of a contract is intrinsically linked to the cost-effectiveness of the contract

4 from a ratepayer's perspective. The analysis behind the Company's analysis is not thorough

5 enough to conclude that 115,000 Dth per day contract with NED is reasonably cost-effective. In

6 its testimony the Company compares the NED project with two other projects, i.e. C2C and the

7 Atlantic Bridge pipeline proposals. For each comparison the Company assumes a contract

8 amount of 115,000 Dth per day. Using this assumption the Company concludes that the NED

9 project is less costly than the other two. Also, the Company's discussion about non-cost factors

10 such as reliability, flexibility and viability is limited to a comparison of the three projects

11 assuming a capacity level of 115000 Dth per day. Such an analysis is insufficient to come to a

12 conclusion that the specific contract with NED is reasonably cost effective.

13 **Q. Why do you believe that just comparing three projects assuming contracted**  
14 **capacity amounts of 115,000 Dth is not sufficient to demonstrate that the contract with**  
15 **NED is reasonably cost effective?**

16 A. There are essentially two reasons. First, there is the issue of existing contracts remaining

17 in place depending on whether or not the NED contract materializes. A proper comparison of

18 the three projects needs to recognize that the existing EnergyNorth Concord Lateral contracts

19 will be supporting significant capacities if the other contracts with C2C and Atlantic Bridge

20 proceed as proposed. The comparative analysis should therefore model the relevant levels of

21 capacities from the alternatives. The levels of capacity from the alternatives may not be 115,000

1 Dth per day necessarily, even when compared to 115,000 Dth per day for NED (with the  
2 elimination of existing contracts).

3 **Q. What is the second reason?**

4 A. The second reason is more important. The crucial threshold question, as to what is the  
5 optimal capacity amount from NED, requires a comparison of contracts with different levels of  
6 capacity for NED. At best, it appears that the Company's position is that a capacity procurement  
7 of 115,000 Dth per day from NED (with adjustment for elimination of existing contracts) is  
8 appropriate because that is the amount needed to ensure that the design-day requirement in 2038  
9 is fully met by the incremental capacity being contracted with NED. I disagree that a capacity  
10 contract should be considered appropriate based on that characterization. What is appropriate is  
11 largely a question about costs to ratepayers. A careful analysis to determine the appropriate level  
12 of capacity to contract from NED, is essentially about determining what would be a reasonable  
13 cost exposure for ratepayers over years into the future (say, twenty years). That analysis  
14 includes weighing all available alternatives, including consideration of a greater real-time market  
15 exposure, determining what level of capacity contract with NED reasonably minimizes the  
16 expected cost of procurement going forward, and reasonably aligning the burden and benefits to  
17 ratepayers across years.

18 **Q. Has the Company demonstratively conducted any analysis to determine what**  
19 **amount of NED pipeline capacity minimizes ratepayer costs?**

20 A. No. The Company conducted an analysis of a capacity level of 115,000 Dth per day  
21 (while eliminating some existing contracts) for NED, C2C and Atlantic Bridge, and an  
22 evaluation of non-cost factors to compare these projects. Such an analysis is not adequate to

1 determine whether a particular level of capacity is appropriate for a contract with a particular  
2 project like NED. As a preliminary matter, it is important to look at different levels of capacities  
3 for NED and the implication for expected costs in conjunction with a reasonable assessment of  
4 the non-cost factors. Such an analysis is crucially needed to determine the appropriate level of  
5 capacity (or a range of capacities) to contract.

6 **Q. You discuss how the question of whether or not existing contracts should remain in**  
7 **place depending on whether or not the NED contract materializes requires modeling**  
8 **capacity levels for C2C and Atlantic Bridge that are different from 115,000 Dth per day.**  
9 **Did you request the Company to conduct such an analysis?**

10 A. Yes. In data requests OCA 2-1, OCA 2-2 and OCA 2-3, (collectively Attachment PKC-  
11 2) the Company was requested to conduct the SENDOUT® runs assuming contracts with C2C  
12 and Atlantic Bridge for 65,000 Dth per day while existing Concord Lateral contracts with  
13 Tennessee Gas Pipeline (TGP) remain in place, and provide cost comparisons with the PA's  
14 NED contract. The Company shows that the NED project as proposed under the PA has lower  
15 net costs in net present value (NPV) term compared to the other contracts to the tune of  
16 approximately 200 million dollars over the period 2018-2038. Two points are worth noting here.  
17 First, a significant part of the net-cost savings is on account of greater mitigation revenues  
18 assumed by the Company with the NED contract relative to the other contracts (deltas of \$100  
19 million for C2C and \$80 million for Atlantic Bridge). We believe that the deltas need greater  
20 explanation than what has been provided. Second, the choice of 65,000 Dth per day as the  
21 capacity level for either C2C or Atlantic Bridge in our request to the Company should not be  
22 construed to indicate that the OCA identifies the 65,000 Dth per day as optimal. The choice of

1 that level is purely derived from the PA's NED capacity level by subtracting the total capacity  
2 associated with the existing Concord Lateral contracts.

3 **Q. Please summarize the findings from these two cost comparisons, i.e. PA's NED**  
4 **versus C2C with 65,000 Dth per day and PA's NED versus Atlantic Bridge 65,000 Dth per**  
5 **day.**

6 A. When one compares the PA's 115,000 Dth per day NED contract with 65,000 Dth per  
7 day C2C and Atlantic Bridge contracts, the PA's NED contract is less costly than the C2C and  
8 Atlantic Bridge contracts, even if one ignores the differences in mitigation revenues as assumed  
9 by the Company in its SENDOUT® runs. On its face the PA's NED contract is more cost-  
10 effective than the other contracts. However, this does not mean that the PA's NED contract is  
11 necessarily optimal or appropriate. That can be determined only after alternative levels of  
12 capacity for the NED contract are carefully analyzed.

13 **Q. In considering the optimal capacity level for NED, did you request the Company**  
14 **analyze capacity levels other than 115,000 Dth per day for NED?**

15 A. Yes. Data request OCA 2-5 (Attachment PKC-3) requested the Company provide  
16 analysis of capacity amounts of 105,000 Dth per day, 95,000 Dth per day, 85,000 Dth per day,  
17 75,000 Dth per day, and 65,000 Dth per day using SENDOUT®. The data request asked the  
18 Company to report different measures of cost and state the assumptions behind these runs.

19

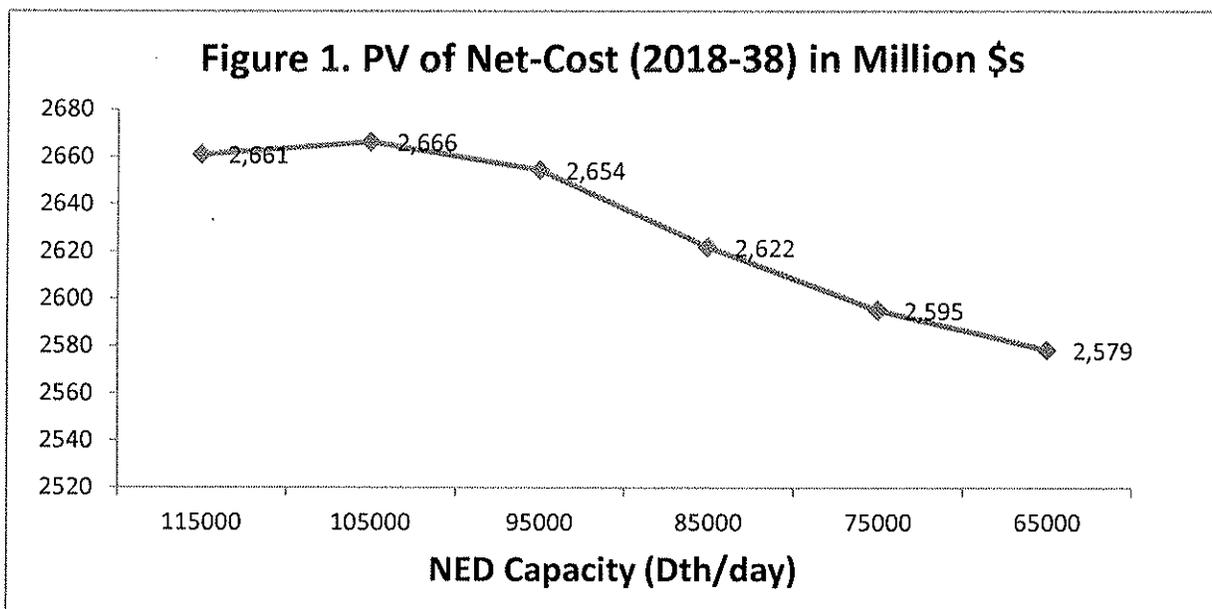
20

1 **Q. Please state what assumptions were made by the Company in conducting the**  
2 **SENDOUT® runs for the different levels as requested by the OCA?**

3 A. For all of those runs, the Company effectively modeled 115,000 Dth per day. Any  
4 reduction in the NED capacity was exactly replaced by an equal capacity level from the existing  
5 Concord Lateral contracts (see Company's response to OCA 2-5, pages 2&3, Attachment PKC-  
6 3). It is, therefore, important to recognize that even when I discuss the capacity levels ranging  
7 from 115,000 Dth per day to 65,000 Dth per day below, the scenarios as modeled by the  
8 Company are all effectively modeling 115,000 Dth per day assuming apposite levels of usage  
9 from existing Concord Lateral contracts.

10 **Q. What does the look at the six scenarios reveal about net-costs?**

11 A. The net costs associated with the six scenarios analyzed are depicted in Figure 1 below.  
12 It is evident from the Company's response to OCA 2-5, that of those six scenarios, the least cost  
13 capacity level is 65,000 Dth per day (while continuing to use the entire existing contracts that  
14 otherwise would be discontinued under the company's contract associated with the PA).



15

1 Compared to a NED capacity level of 115,000 Dth per day, the cost is estimated to be about \$83  
2 million dollars lower (in NPV terms). As is discussed later, the Company's response indicates  
3 that a NED capacity amount that is optimal is very likely less than 65,000 Dth per day, when the  
4 goal is strictly to minimize the net costs. Indeed, if the intention is to be more precise on what  
5 minimizes net costs the Company can determine that by modeling capacity levels below 65,000  
6 Dth per day, say in increments of 5,000 Dth per day, using SENDOUT®, by strictly assuming  
7 that the existing Concord Lateral contracts continue. This would provide information about how  
8 much lower the effective capacity level should be relative to 115,000 Dth per day to reach the  
9 least cost option.

10 **Q. Since the Company did not model capacity levels less than 115,000 Dth per day, can**  
11 **you conclude that a NED capacity level of 65,000 Dth per day along with 50,000 Dth of**  
12 **capacity from existing contracts attains the most cost-effective level of capacity for NED?**

13 A. No. To determine the most cost effective level of capacity for NED it is incumbent on  
14 the Company to carefully conduct SENDOUT® runs for NED capacities below 65,000 Dth per  
15 day (while retaining existing Concord lateral capacity of 50,000 Dth per day). It is my  
16 recommendation that the Commission direct the Company to conduct SENDOUT® runs for  
17 NED capacities in decrements of 5,000 Dth per day relative to the 65,000 Dth per day scenario  
18 (with the existing Concord Lateral contracts in place) to adequately inform where the cost-  
19 effective level of capacity for NED lies. A careful examination of the Company's response to  
20 data request OCA 2-5 I undertake below suggests that the reasonably optimal level of NED  
21 capacity contract is tangibly below 65,000 Dth per day (assuming continuation of the existing  
22 Concord Lateral contracts).

1 **Q. Please discuss your analysis.**

2 A. In Figure 1, the curve representing the NPV of options will likely continue to drop as the  
3 NED capacity is reduced (assuming that existing Concord Lateral contracts remain in place).  
4 That conclusion can be confirmed through other observations. Table 1 below is a look at cost  
5 data both with and without mitigation revenue as assumed by the Company. (I rely on the  
6 information in Attachment PKC-3). Table 1 shows the average per Dth portfolio costs (without  
7 mitigation cost) associated with all of the scenarios analyzed by the Company from 2018-19 to  
8 2037-38. Table 1 shows the per Dth costs in NPV terms in the table below.

	<b>PA</b>	<b>105K</b>	<b>95K</b>	<b>85K</b>	<b>75K</b>	<b>65K</b>
<b>2018-19</b>	8.86	8.69	<b>8.72</b>	8.44	8.16	7.88
<b>2019-20</b>	8.62	8.47	<b>8.49</b>	8.24	7.98	7.72
<b>2020-21</b>	8.46	8.31	8.28	8.04	7.82	7.59
<b>2021-22</b>	8.28	8.13	8.11	7.88	7.67	7.46
<b>2022-23</b>	8.09	7.94	7.92	7.71	7.50	7.30
<b>2023-24</b>	7.86	7.72	7.71	7.51	7.31	7.12
<b>2024-25</b>	7.66	7.53	7.51	7.32	7.14	6.95
<b>2025-26</b>	7.44	7.31	7.29	7.12	6.94	6.76
<b>2026-27</b>	7.23	7.10	7.08	6.92	6.75	6.58
<b>2027-28</b>	7.01	6.88	6.86	6.72	6.56	6.39
<b>2028-29</b>	6.82	6.70	6.68	6.54	6.39	6.23
<b>2029-30</b>	6.63	6.51	6.44	6.36	6.21	6.08
<b>2030-31</b>	6.44	6.33	6.26	6.19	6.05	5.93
<b>2031-32</b>	6.25	6.14	6.07	6.00	5.87	5.79
<b>2032-33</b>	6.08	5.98	5.91	5.85	5.72	5.65
<b>2033-34</b>	5.91	5.81	5.74	5.69	5.57	5.53
<b>2034-35</b>	5.74	5.64	5.58	5.52	5.42	5.40
<b>2035-36</b>	5.58	5.48	5.41	5.34	5.29	<b>5.30</b>
<b>2036-37</b>	5.43	5.34	5.27	5.21	5.16	<b>5.20</b>
<b>2037-38</b>	5.28	5.19	5.14	5.08	5.04	<b>5.10</b>

9

1 Two points are worth making here. First, as we move across a row, the per unit costs are  
2 predominantly decreasing. As we move from the 105,000 scenario to the 65,000 scenario the per  
3 unit costs decrease, except for the couple of small upward ticks shown in the cells with numbers  
4 that are italicized and bold. These upward ticks are for 2018-19 and 2019-20 when moving from  
5 105,000 to 95,000, and for 2035-36, 2036-37 and 2037-38 when moving from 75,000 to 65,000.<sup>1</sup>  
6 The table shows that the downward trends in the average procurement costs dominate the upward  
7 trends that seem to kick in for the last three years for the analyzed years. This indicates that cost  
8 savings have most likely not been adequately extracted yet, and lower capacity procurement with  
9 NED can lead to further reduction in rate payers' costs overall. At the least, there is a need to  
10 conduct scenario analysis assuming lower levels of NED capacity, even when the existing  
11 Concord Lateral contracts are assumed to stay effective.

12 Secondly, and very importantly, average procurement costs in later years are significantly lower  
13 than the average procurement costs borne by ratepayers over the early years even with the 65,000  
14 scenario (this is also true and more pronounced for the other scenarios analyzed). Ironically,  
15 while the supply needs for ratepayers are more urgent well in the future, ratepayers from current  
16 years will pay substantially more than the ratepayers who are actually driving the needs, even  
17 with the 65,000 scenario. Greater parity in the burdens faced by ratepayers across time as well  
18 as the need to better align costs with benefits, indicates that a lower capacity level is more  
19 appropriate. This only further emphasizes the need to conduct scenario analysis assuming lower  
20 levels of NED capacity, even when the existing Concord Lateral contracts are assumed to stay  
21 effective.

22

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<sup>1</sup> The downward movements in the average costs are quite substantial in absolute terms for years up to early 2030.

1 **Q. What do you mean by better alignment between costs and benefits?**

2 A. When a utility procures additional capacity discretely through a contract, ratepayer  
3 supply needs in later years of the contract drive the need for the contracted capacity. It is those  
4 ratepayers that significantly benefit more from the contract than ratepayers facing the burden of  
5 costs in the early years of the contract. Economic efficiency requires that it is the ratepayers in  
6 the later years of the contract that should be paying reasonably more than ratepayers in the near  
7 term, than what the Company's proposal envisions. A unit cost of \$5.10 per Dth for a customer  
8 in 2037-38, compared to a unit cost of \$7.88 per Dth for a customer in 2018-19 (using the 65,000  
9 scenario) is inherently inefficient economically because the benefits are larger for the typical  
10 customer in 2037-38 compared to 2018-19. A contract for a capacity significantly lower than  
11 65,000 for NED (while existing contracts for 50,000 continue) is appropriate because of  
12 economic efficiency reasons (and of course for fairness across ratepayers over different years).  
13 Interestingly, even with the optimization of the capacity where the goal is cost-minimization  
14 without a reasonable recognition of the alignment of costs with benefits across years, the burden  
15 on current ratepayers may be economically inefficient. Nevertheless, such an optimization  
16 *relative* to what the company has proposed would still produce significant improvement in  
17 economic efficiency. As a threshold, it is therefore vital that a determination of what is an  
18 appropriate capacity level should at least be based on the goal of minimizing the ratepayers'  
19 burden. The Company has not conducted such an analysis and the OCA urges that the  
20 Commission require Liberty to conduct a reasonably rigorous cost-minimization exercise to  
21 analyze the appropriate capacity level to contract.

22

1 **Q. Please discuss the cost data assuming the existence of mitigation revenue.**

2 A. I again rely on Attachment PKC-3, the Company's response to data request OCA 2-5 for  
3 this analysis. In Table 2, I review the average per Dth net costs associated with all of the  
4 scenarios analyzed by years from 2018-19 to 2037-38. Table 2 reports these per Dth costs in  
5 NPV terms (rounded to the second decimal).

	<b>PA</b>	<b>105K</b>	<b>95K</b>	<b>85K</b>	<b>75K</b>	<b>65K</b>
<b>2018-19</b>	7.94	7.79	<b>7.87</b>	7.74	7.62	7.49
<b>2019-20</b>	7.81	7.66	<b>7.73</b>	7.61	7.50	7.39
<b>2020-21</b>	7.71	7.57	7.57	7.46	7.38	7.30
<b>2021-22</b>	7.60	7.47	7.46	7.35	7.27	7.19
<b>2022-23</b>	7.47	7.34	7.33	7.22	7.15	7.07
<b>2023-24</b>	7.30	7.18	7.17	7.07	7.00	6.93
<b>2024-25</b>	7.16	7.03	7.01	6.92	6.85	6.78
<b>2025-26</b>	6.98	6.86	6.84	6.74	6.68	6.61
<b>2026-27</b>	6.81	6.69	6.67	6.57	6.51	6.45
<b>2027-28</b>	6.63	6.52	6.49	6.40	6.34	6.28
<b>2028-29</b>	6.48	6.37	6.34	6.25	6.19	6.13
<b>2029-30</b>	6.32	6.21	6.14	6.10	6.04	5.98
<b>2030-31</b>	6.17	6.07	6.00	5.95	5.89	5.85
<b>2031-32</b>	6.01	5.91	5.84	5.79	5.74	5.71
<b>2032-33</b>	5.88	5.78	5.71	5.66	5.61	5.58
<b>2033-34</b>	5.74	5.64	5.57	5.52	5.47	5.46
<b>2034-35</b>	5.60	5.51	5.45	5.39	5.34	5.34
<b>2035-36</b>	5.45	5.37	5.33	5.27	5.21	<b>5.25</b>
<b>2036-37</b>	5.33	5.25	5.20	5.14	5.09	<b>5.14</b>
<b>2037-38</b>	5.21	5.13	5.07	5.01	4.98	<b>5.05</b>

\* For the PA scenario, I have used the Total Cost figures from the Company's response to Staff 1-12 (see PKC-4), that uses Transport Costs rather than Demand Costs.

6

7 Moving across a row in Table 2, from the 105,000 scenario to the 65,000 scenario the per unit  
8 costs are generally decreasing. There are a couple of small upward ticks (figures shown italicized  
9 and bold) for 2018-19 and 2019-20 when moving from 105,000 to 95,000, and upward ticks

1 between 75,000 and 65,000 scenarios for the years 2035-36, 2036-37 and 2037-38. The table  
2 shows that the downward trends in the average net costs dominate the upward trends that seem to  
3 kick in for the last four years for the analyzed years. This indicates that cost savings have not  
4 been adequately extracted yet, and lower capacity procurement with NED relative to the 65,000  
5 scenario is necessary to reduce rate payers' costs overall.

6 The points discussed above about economic efficiency in the context of analyzing procurement  
7 costs (absent mitigation revenues) remain valid even when one focuses on just net costs.

8 **Q. Is there any other observation that speaks to the point about the PA's NED contract  
9 not being appropriate? If so, please elaborate.**

10 A. Yes. It is very important to understand that the Company has conducted only one  
11 SENDOUT® run under the assumption that specific existing Concord Lateral contracts are  
12 eliminated. That run assumes a NED capacity of 115,000 Dth per day (the PA's contract).  
13 Under the assumption that the existing Concord Lateral contracts are eliminated, whether or not  
14 115,000 Dth per day is the optimal capacity level for ratepayers, cannot be determined unless  
15 other capacity levels are also investigated in additional SENDOUT® runs under the same  
16 assumption. Even before weighing the non-cost attributes, it is important that the Company  
17 conduct SENDOUT® runs for capacity levels other than 115,000 Dth per day assuming that  
18 Concord Lateral contracts are eliminated. Without the benefit of such analysis, it is not possible  
19 to determine definitively the appropriate capacity level to contract with NED. Given the benefit  
20 of the solitary SENDOUT® run for 115,000 Dth per day, however, a closer look at cost data  
21 comparing NED with non-NED procurements indicates that at least, at the margin, the PA's  
22 115,000 Dth per day contract is not optimal, and lower costs would potentially require a lower

1 capacity level. I would also urge here that given the analysis above of the Company’s response  
 2 to data request OCA 2-5 coupled with what follows, the Commission should direct the Company  
 3 to conduct scenario analysis for other levels in decrements of 5,000 Dth per day relative to  
 4 115,000 Dth per day, say up to 80,000 Dth per day.

5 Table 3 below reports the average procurement cost for PA’s NED contract relative to the  
 6 average procurement cost of non-NED resources, along with the yearly takes. I have also  
 7 reported a similar comparison of net costs. While it is unrealistic to assume that mitigation  
 8 revenues only accrue due to the presence of the NED project, in reporting the net costs I have  
 9 assumed that. That provides a comparison of the net costs between NED and non-NED  
 10 procurements, which conservatively favors the NED project. In reality, even if we assume the  
 11 same mitigation revenues overall, some of the mitigating revenues will almost certainly accrue to  
 12 non-NED resources. That will lower the net costs associated with non-NED resources.  
 13 Consequently, the NED net cost will be higher than what is assumed in the conservative scenario  
 14 discussed below.

**Table 3. Average Portfolio and Net Costs per Dth: NED versus Non-NED**

	Take (MDT)		Portfolio Cost		Net Cost	
	NED	Non-NED	NED	Non-NED	NED	Non-NED
<b>2018-19</b>	10,659	6,824				
<b>2019-20</b>	11,254	6,848				
<b>2020-21</b>	11,493	6,816				
<b>2021-22</b>	11,785	6,813				
<b>2022-23</b>	12,081	6,814				
<b>2023-24</b>	12,488	6,839				
<b>2024-25</b>	12,655	6,807				
<b>2025-26</b>	12,919	6,805				
<b>2026-27</b>	13,186	6,802				
<b>2027-28</b>	13,562	6,827				
<b>2028-29</b>	13,739	6,796				
<b>2029-30</b>	14,007	6,794				

<b>2030-31</b>	14,297	6,790	
<b>2031-32</b>	14,694	6,816	
<b>2032-33</b>	14,885	6,784	
<b>2033-34</b>	15,194	6,780	
<b>2034-35</b>	15,507	6,777	
<b>2035-36</b>	15,922	6,804	
<b>2036-37</b>	16,096	6,774	
<b>2037-38</b>	16,390	6,772	

1

2 It is evident from Table 3 that the average procurement cost of NED capacity is higher than that  
 3 of non-NED capacity (in NPV term) for all years from 2018-19 to 2037-38. The difference is as  
 4 high as <<<BEGIN CONFIDENTIAL>>>

5 <<<ENDS CONFIDENTIAL>>> for 2037-38. Given fixed load requirements (based on the  
 6 Company’s forecast), a lower capacity level for the NED contract, would potentially lead to a  
 7 lower annual Dth consumption and average cost of procurement for NED, while resulting in a  
 8 higher annual Dth consumption and higher average procurement cost for non-NED. At least at  
 9 the margin around 115,000 Dth per day scenario, when the capacity level is reduced for NED,  
 10 given that (1) the NED take is significantly higher than that of the non-NED take, and that (2) the  
 11 NED average procurement costs are well higher than that of procurement costs for non-NED for  
 12 many of the years as shown in Table 3, the ratepayers’ costs will very likely diminish with the  
 13 decrease in the capacity level for NED below 115,000 Dth per day. The findings from my  
 14 analysis of Attachment PKC-3 further underscores my belief. Of course, one can readily confirm  
 15 whether that is indeed the case if SENDOUT® runs are conducted for different levels of NED  
 16 capacity. For example SENDOUT® runs of, 110,000 Dth per day, 105,000 Dth per day, 100,000  
 17 Dth per day and so on (assuming that the existing Concord Lateral contracts are eliminated)  
 18 would be very helpful. I therefore strongly recommend the Commission direct the Company to

1 conduct the runs mentioned above. Such an analysis is not burdensome, and is important in  
2 determining the appropriate level of the EnergyNorth capacity contract with NED.

3 **Q. Please briefly summarize your findings on the net costs.**

4 A. The same conclusion as discussed above is also supported when one compares the net  
5 costs for NED with non-NED procurements. The recommended SENDOUT® runs for NED  
6 capacities in decrements of 5,000 Dth per day starting from 110,000 Dth per day (assuming that  
7 the existing Concord Lateral contracts are eliminated) will provide the data needed to more  
8 precisely determine the capacity level that reasonably minimizes net costs.

9 **Q. Do you have any additional observations?**

10 A. Yes. I want to highlight two important points. First, it is clear that current ratepayers are  
11 burdened with a significantly higher average price per Dth than future ratepayers, even with  
12 Liberty's PA proposal. It is fundamentally unreasonable to require ratepayers now to  
13 unnecessarily bear significantly greater burden compared to ratepayers in the future, when the  
14 supply and reliability needs are predominantly being caused by ratepayers in the future. Given  
15 the facts that are already available in this case, greater economic efficiency alone requires a  
16 contract for a lower capacity level than that proposed by the Company.

17 Second, it is important to understand the difference between contract period and planning  
18 horizon. The Company's proposal targets the design day for planning purposes to be the same as  
19 the last year of the contract period. That approach is misplaced. Regardless of the length of a  
20 proposed long-term contract, the planning horizon should be endogenously determined by a goal  
21 of cost minimization with respect to the level of contract, given pricing and cost data. To  
22 reasonably obtain the least cost option for ratepayers, and to properly address the cost disparity

1 between current ratepayers and future ratepayers, the contract level associated with the long-term  
2 NED contract would be very likely lower than what the design day requirement in 2037-38 (the  
3 last year of the proposed PA contract) would require. In other words, the analysis shows that the  
4 optimal contract level will likely target a design day that is significantly less than twenty years  
5 (the contract period) into the future.

6 **Q. Do you have any other observation on the issue of planning horizon?**

7 A. Yes. Given the information set on demand and a new long-term contract, one could  
8 determine the planning horizon endogenously (that aligns with the optimal capacity level) by  
9 conducting a cost-minimization exercise assuming, that the contract length is the period over  
10 which the NPV is evaluated. One could also conduct a variant cost-minimization analysis that  
11 better aligns benefits with cost-incidences over years, by attaching greater weights to current  
12 ratepayers than future ratepayers. Another alternative would be to plan for a design day that is  
13 not too far into the future, say 5 to 10 years into the future. Such an approach is reasonable  
14 because it appropriately focuses on the interests of current ratepayers, produces a more  
15 economically efficient outcome than the cost-minimization model mentioned above. Such an  
16 approach is also analytically less demanding.

17 **Q. You have indicated before that non-cost factors matter. Please explain.**

18 A. Non-cost factors like flexibility, viability and reliability matter in determining the  
19 reasonable capacity to contract, once tangible cost implications are properly understood by  
20 analyzing different contract levels. In determining the appropriate capacity level to contract with  
21 NED, the Company should analyze the non-cost factors in conjunction with the analysis the  
22 OCA has urged the Commission to direct Liberty Utilities to provide. The cost analysis being

1 urged by the OCA is critically necessary in determining the appropriate level to contract with  
2 NED.

3 **Q. Briefly discuss your findings on the optimal capacity level for the NED contract.**

4 A. The Company has not conducted an appropriate analysis to determine the optimal  
5 capacity level under the PA terms. The Company's responses to the OCA's data requests and  
6 the analysis of the PA's contract provide sufficient information to indicate that the cost-effective  
7 level of NED capacity is smaller than 115,000 Dth per day. The points that follow need to be  
8 underscored.

9 First, it appears that the Company's position is that a capacity procurement of 115,000 Dth per  
10 day from NED (with adjustment for elimination of existing contracts) is appropriate because that  
11 is the amount needed to ensure that the design-day requirement for the last year of the  
12 contractual term is fully met by the incremental capacity being contracted with NED. I disagree  
13 with this conclusion. Appropriateness of a contract must be based on determining the cost-  
14 effectiveness of such a contract, as ultimately whether or not such a contract leads to just and  
15 reasonable rates for ratepayers is greatly informed by the cost-effectiveness of a contract. For a  
16 reasonable assessment of the cost-effectiveness of a long-term contract, it is imperative that not  
17 only contracts with alternative new projects are examined, it is also crucial that different levels of  
18 pipeline capacities are examined with and without existing contracts remaining in place (as  
19 relevant). Importantly, my analysis indicates that the optimal contract level would likely target a  
20 design day that is significantly less than twenty years into the future.

21 Second, by the Company's own analysis, a capacity level of 65,000 Dth per day (with the  
22 existing contracts remaining in place) is better than 115,000 Dth per day when the goal is to

1 minimize the burden on ratepayers. If the Commission approves a capacity level of 115,000 Dth  
2 per day, it will make the utility's ratepayers pay unnecessary costs estimated at about \$83 million  
3 in NPV terms over twenty years. If such overpayment is justified because of non-cost factors, it  
4 is important that the Company provides persuasive explanation to that effect. It has not provided  
5 such an analysis. In such an analysis it is incumbent upon the Company to explain why meeting  
6 reliability needs that are more future-driven should put significantly greater burden on current  
7 ratepayers relative to future ratepayers. When one compares a NED contract of 115,000 Dth per  
8 day with that of 65,000 Dth per day (as analyzed by the Company in its response to OCA 2-5),  
9 one can see that the net-costs are more front-loaded. For example, the net cost is higher in year  
10 2018-19 for 115,000 Dth per day relative to that with 65,000 Dth per day by about 5 million  
11 dollars. The same comparison for year 2037-38 yields about 2.5 million dollars. This shows that  
12 a subsidy that is inherently part and parcel of current ratepayers' burden when a new pipeline  
13 capacity is contracted long-term, is particularly unfair when a capacity level is approved that is  
14 demonstratively not cost-effective.

15 **Q. Please summarize your position with respect to the Company's petition requesting**  
16 **the approval of the PA agreement.**

17 A. Contrary to what the Company has stated, I do not believe it has met the burden of proof  
18 in determining that 115,000 Dth per day (while eliminating existing Concord Lateral contracts) is  
19 an appropriate capacity level to contract with NED. Given my analysis above, it is extremely  
20 important that Liberty Utilities is directed by the Commission to analyze different levels of  
21 capacities, in decrements of 5,000 Dth/day, relative to the PA's proposed level of 115,000  
22 Dth/day. It is my recommendation that capacity levels as low as 80,000 Dth per day should be  
23 examined. I also urge the Commission to properly account for economic efficiency

1 considerations in analyzing the appropriateness of a contract to ensure that current ratepayers are  
2 not unfairly burdened. Any consideration of non-cost factors should be properly explained and  
3 viewed in conjunction with the cost analysis that the OCA is urging the Commission to direct  
4 Liberty Utilities to conduct.

5 **Q. Do you want to bring to attention any other point?**

6 A. I am cognizant, based on Attachment PKC-3, that "...the Precedent Agreement filed for  
7 approval in this docket does not contemplate any volumes below 100,000 Dth and would require  
8 renegotiated terms and conditions to address any lower volume." Dafonte, page 3 of 3. Whether  
9 or not the appropriate contract level requires renegotiated terms should not drive the  
10 Commission's decision. I strongly urge the Commission to require the Company to properly  
11 meet the burden of proof in determining the appropriate level of contract by providing additional  
12 analysis requested above.

13 **Q. Does this conclude your testimony?**

14 A. Yes.

