

STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

In the matter of

Liberty Utilities (EnergyNorth Natural Gas) Corp.

Docket No. DG 18-140

Petition for Approval of a Renewable Natural Gas Supply and Transportation Contract

DIRECT TESTIMONY

OF

Dr. Pradip K. Chattopadhyay
Assistant Consumer Advocate

February 22, 2018

1 **I. Introduction**

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

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

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

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

15 From March 1998 to October 1999, I was a consultant with the National Council
16 of Applied Economic Research, New Delhi, India. From November 1999 to August
17 2001, I was the Economist at the Uttar Pradesh Electricity Regulatory Commission
18 (UPERC) in India, and advised UPERC on tariff issues. From September 2001 to June
19 2002, I worked at the National Regulatory Research Institute, Columbus, Ohio, as a
20 graduate research associate while pursuing advanced courses in Energy Planning in the

1 City and Regional Planning Program at Ohio State University. From June 2002 to July
2 2002, I worked at the World Bank, Washington D.C. as a short-term consultant/intern
3 with its Energy and Water Division.

4 I worked at the New Hampshire Public Utilities Commission (Commission) from
5 August 2002 to January 2007 in the capacity of a Utility Analyst. My responsibilities at
6 the Commission as an analyst were in electric utility issues including analyzing and
7 advising the Commission on rate design, cost of capital issues, wholesale market issues,
8 and other regional matters. I briefly worked at the Massachusetts Department of
9 Telecommunications and Energy (later reorganized into Department of Public Utilities
10 (MA-DPU)) starting in January 2007 as an Economist. At MA-DPU, I represented the
11 staff and examined gas demand estimation and forecasting, decoupling issues, and
12 environmental remediation matters.

13 I returned to the Commission in June 2007 to join its Telecom Division as its
14 Assistant Director, and continued in that position until December 2010. I was also
15 helping other divisions as an expert witness in economics-related issues as well as
16 advising the Commission on regional electric matters including FERC jurisdictional
17 issues. I joined the Commission's Regional Energy Division in January 2010 as the
18 Regional Energy Analyst, and was advising the Commission in that capacity until I
19 joined the Antitrust and Utilities Division, Office of the Minnesota Attorney General, in
20 August 2013.

1 I came back to New Hampshire in March 2014 and worked as an independent
2 consultant until the end of August, 2014, representing the Minnesota Attorney General.
3 I joined Liberty Utilities in August, 2014 as a Forecasting Analyst for its Energy
4 Procurement Department. I worked with Liberty Utilities for about three months. In
5 December 2014, I joined the OCA as its Rate and Market Policy Director. I was later
6 appointed as the Assistant Consumer Advocate at the OCA.

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

8 A. Yes.

9 **Q. In which dockets did you testify?**

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

- 11 • DE 03-200 – Rate design testimony which was about delivery rates for retail
12 ratepayers of Public Service of New Hampshire (PSNH)
- 13 • DE 06-028 – Cost of capital testimony which was also about PSNH’s delivery
14 rates
- 15 • DT 07-027 – Status of competition in retail telephony under TDS
- 16 • DG 08-009 – Cost of equity testimony related to gas delivery rates of National
17 Grid NH
- 18 • DE 09-035 – Cost of equity testimony in the matter of electric distribution
19 rates (PSNH)

- 1 • DG 14-380 – Petition of Liberty Utilities (EnergyNorth Natural Gas)
2 requesting approval of firm transportation contract (North East Direct (NED))
- 3 • DG 15-155 – Petition of Valley Green, LLC requesting franchise in City of
4 Lebanon and Town of Hanover, New Hampshire
- 5 • DG 15-289 – Petition of Liberty Utilities (EnergyNorth Natural Gas)
6 requesting franchise in City of Lebanon and Town of Hanover, New
7 Hampshire
- 8 • DG 15-494 – Petition of Liberty Utilities (EnergyNorth Natural Gas)
9 requesting approval of firm transportation contract (NED)
- 10 • DE 16-383 – Petition of Liberty Utilities (Granite State Electric) for Permanent
11 Rate Increase
- 12 • DE 16-384 – Petition of Unitil for Permanent Rate Increase
- 13 • DG 16-852 – EnergyNorth’s Petition for Lebanon-Hanover Franchise
14 Approval
- 15 • DG 17-048 – EnergyNorth’s Gas Distribution Service Rate Case
- 16 • DG 17-070 – Northern Utilities’ Gas Distribution Service Rate Case
- 17 • DW 17-165 – Provided oral testimony on Return on Equity (ROE) and Rate
18 Design matters
- 19 • DW 17-118 – Provided oral testimony on ROE issues
- 20 **Q. Have you ever provided testimony and affidavits before other Commissions?**

1 A. Yes. I have testified on cost of capital before the Minnesota Public Utilities
2 Commission in dockets G008/GR-13-316 and GR 13-617. I have also provided an
3 affidavit before the Federal Energy Regulatory Commission in a FERC Docket ER 09-14-
4 000 on NSTAR's petition for ROE incentive adders on behalf of the New England
5 Conference of Public Utilities Commissioners (NECPUC).

6 **Q. What is the purpose of your testimony?**

7 A. The purpose of my testimony is to analyze EnergyNorth's request for approval
8 of a Renewable Natural Gas (RNG) Supply and Transportation Agreement (RNG
9 Agreement) with RUDARPA, Inc. and provide my recommendations for the
10 Commission's consideration.¹ As the OCA statutorily represents the interests of
11 residential ratepayers at large, its primary focus in this docket is to determine whether
12 the proposed RNG project is in the interest of residential ratepayers, especially existing
13 customers of EnergyNorth. Given that focus, the OCA has primarily conducted an
14 economic analysis of whether the approval of the instant RNG Agreement leads to a
15 cost-effective outcome for EnergyNorth's Sales Customers (who are predominantly
16 residential customers). Of course, extraction of RNG from a landfill and injection into
17 pipelines also raise engineering and gas quality issues. Those issues are however not
18 within the scope of my testimony.

¹ Renewable natural gas is described in the agreement as landfill gas which has been collected via a facility at the North Country Landfill, treated, and compressed so that it is "pipeline ready." Attachment WJC/MES-1, Page 1.

1 **Q. Please discuss how your testimony is organized.**

2 A. Section II summarizes the Company's petition, focusing largely on factors that
3 pertain to the OCA's subsequent analysis. Section III provides OCA's analysis and
4 findings with respect to whether the RNG Agreement between EnergyNorth and
5 RUDARPA is in the interest of ratepayers. While this analysis focuses on a comparison
6 between the expected cost of the RNG supplies and the expected avoided supply costs,
7 it also delves into the contractual terms, in particular, that of Section 2.10, RNG Supply
8 and Transportation Agreement.² The OCA provides its view on the requirement that
9 the Company is bound to purchase RUDARPA's production facility if RUDARPA
10 "meets or exceeds the Minimum Annual Supply Quantities during the first or second
11 years." Finally, Section IV provides the OCA's recommendations.

12

13 **II. Company's Petition**

14 **Q. Please provide brief descriptions of the financial elements associated with the**
15 **construction of the RNG production facility, the delivery logistics, and the burden on**
16 **EnergyNorth's Sales Customers.**

17 A. EnergyNorth's RNG Agreement with RUDARPA requires EnergyNorth to
18 incorporate RNG from a landfill located in Bethlehem, New Hampshire into its supply
19 portfolio. It will be RUDARPA's sole responsibility to design, construct and finance an

² Direct Testimony of William J. Clark and Mark E. Saltsman, Attachment WJC/MES-1, Bates 28.

1 RNG production facility at the North Country Environmental Services (NCES) landfill
2 in Bethlehem. RUDARPA will construct a RNG processing facility to convert raw
3 landfill gas to pipeline-quality RNG. The produced RNG will be subsequently
4 compressed for delivery to compressed natural gas (CNG) receipt points in Concord
5 (Broken Bridge Road), Keene and Lebanon. The RNG Agreement states that
6 RUDARPA is responsible for all costs associated with collection, cleaning, compression
7 and delivery of the RNG to the receipt points indicated above. The Company has
8 agreed to pay a fixed price per dekatherm (Dth) to RUDARPA for the RNG, subject to a
9 consumer price index (CPI) escalator with an annual cap of 2 percent. The Company
10 expects that about 44 percent of the production – and related renewable attributes in
11 the form of thermal renewable energy credits (TRECs) – will be used by two special
12 contract customers that have signed letters of intent (LOIs).³ The Company expects to
13 socialize the costs associated with the excess RNG purchases (i.e., those not required to
14 provide service under the special contracts) across all EnergyNorth’s sales customers.

³Thermal Renewable Energy Credits (TRECs) are a subset of the Class I Renewable Portfolio Standard obligation that the electric distribution utilities must achieve or make an alternative compliance payment of approximately \$25/MWh for any shortfall. They represent utility-procured “useful thermal energy” which is defined at RSA 362-F:2 as “renewable energy delivered from class I sources that can be metered and that is delivered in New Hampshire to an end user in the form of direct heat, steam, hot water, or other thermal form that is used for heating, cooling, humidity control, process use, or other valid thermal end use energy requirements and for which fuel or electricity would otherwise be consumed. In 2019, the electric distribution utilities must procure TRECs equivalent to 1.4% of the MWh load, an obligation which rises by .2 percentage points annually to 2.2% in 2023 and thereafter. Senate Bill 577 of 2018 allows thermal energy generated from renewable methane from landfills to be eligible for Class I-Thermal RECs. *See generally* New Hampshire Public Utilities Commission (PUC) Sustainable Energy Division Website; *see also* New Hampshire PUC 2018 Renewable Portfolio Standard 2018 Review (November 2018) available at: <http://www.puc.state.nh.us/20181101-RPS-Review-2018-FINAL-REPORT-2018-11-01.pdf>

1 **Q. Briefly discuss the pricing terms that EnergyNorth is contractually obligated to**
2 **honor.**

3 A. As mentioned above, EnergyNorth has agreed to pay a fixed price per Dth to
4 RUDARPA, subject to a CPI escalator with an annual cap of 2 percent. In the event
5 EnergyNorth *does not* purchase the RNG Production Facility, the price for RNG per Dth
6 will be \$10.47, \$10.70, \$11.53 and \$12.43 for contract year 1, year 2, year 3, and years 4-
7 17, respectively, subject to the CPI adjustment clause mentioned above.⁴

8 Section 2.10 of the RNG Agreement requires the Company to purchase the RNG
9 production facility if RUDARPA “meets or exceeds the Minimum Annual Supply
10 Quantities during the first or second years.” The agreement sets a not-to-exceed price
11 of \$12.5 million for the purchase of the Production Facility *plus* any financing buyout
12 fees up to \$2 million.⁵

13 In the event EnergyNorth purchases the RNG Production Facility, the per Dth payment
14 to RUDARPA will be reduced to \$6.11, the first year EnergyNorth acquires ownership
15 of the RNG production facility. If EnergyNorth purchases the production facility, the
16 purchase price (plus financing buy-out fees) will be subsumed in EnergyNorth’s Cost of

⁴ Direct Testimony of William J. Clark and Mark E. Saltsman, Attachment WJC/MES-1, Bates 34.

⁵ As described in Section 2.10 of the RNG Agreement, EnergyNorth’s purchase of the facility “shall be subject to the terms of any financing contract executed by [RUDARPA] and a third party financing entity necessitated by [RUDARPA’s] requirement to provide initial ‘interim’ or ‘bridge’ financing for the construction, commissioning, and operation of the Production Facility,” and EnergyNorth is “responsible for any Financing Buy-Out Fees that are part of the financing contract in an amount not to exceed two million dollars (\$2,000,000). Direct Testimony of William J. Clark and Mark E. Saltsman, Attachment WJC/MES-1, Bates 28.

1 Gas (COG) related “rate base,” which consequently will increase the price per Dth
2 beyond the per Dth payments provided to RUDARPA. The prices, per the Company’s
3 levelized estimates, will be \$9.86 per Dth for the first five years, \$10.77 per Dth for the
4 middle five years, and \$11.89 per Dth for the last seven years.⁶

5 **Q. Please provide the RNG production details, based on both the contract as well**
6 **EnergyNorth’s expectation.**

7 A. The RNG Agreement requires RUDARPA to deliver minimum annual supply
8 quantities (“MASQ”) to EnergyNorth on an annual basis over the term of the contract.
9 For contract years 1-5, 6-10, and 11-17, the MASQ are 490,000 Dths annually, 375,000
10 Dths annually, and 270,000 Dths annually, respectively. Contractually, the maximum
11 daily amount of RNG delivery to all of the receipt points (Concord, Keene and
12 Lebanon) is 2400 Dths per day.⁷ In response to a data request from OCA, the Company
13 has however asserted that it does not expect that the RNG deliveries will ever hit the
14 contracted maximum daily amount.⁸

15 As for estimates of landfill gas production levels, the Company projects a range
16 between 1027 Dths per day to 1567 Dths per day over the next ten years or so. The 1567
17 Dths per day estimate is for 2020-21 and the 1027 Dths per day estimate is for 2027-28.⁹
18 For the initial years of the contract, per Company’s responses to OCA data requests, the

⁶ Direct Testimony of William J. Clark and Mark E. Saltsman, Attachment WJC/MES-4, Bates 72.

⁷ Direct Testimony of William J. Clark and Mark E. Saltsman, Attachment WJC/MES-1, Bates 32-33.

⁸ Company Response to OCA 2-5(a).

⁹ Company Response to OCA 1-4.

1 RNG production appears to be roughly 1500 Dths per day with little variation day to
2 day throughout.

3 **Q. Please briefly discuss how the Company expects the Thermal Renewable Energy**
4 **Credits (TRECs) resulting from the RNG to benefit the ratepayers.**

5 A. EnergyNorth also plans to monetize the TRECs associated with the RNG Dths and
6 reduce the COG for customers. The Company proposes using all TREC proceeds except
7 those that will be owned by the special contract customers to proportionally credit
8 customers in each division based on the RNG deliveries at each of the designated receipt
9 points.¹⁰

10 **Q. Has the Company estimated the per Dth TREC credit that customers can expect to**
11 **receive?**

12 A. Yes. The Company has “calculated the TREC value to be between approximately
13 \$3.92-\$4.65 per Dth.”¹¹ The range is the result of relying on efficiency factors between 80
14 percent and 95 percent for end-use heating systems. The value is also based on an ad hoc
15 35 percent discounting of the 2018 Alternative Compliance Payment of \$25.69 per Mwh.
16 Ultimately, the trend in the future value of TRECs would depend on how the TREC
17 market evolves over time. A better understanding of the TREC market realities, both

¹⁰ Special contract customers will directly own the TRECs associated with their consumption of the RNG Dths. It will be their responsibility to sell those TRECs.

¹¹ Direct Testimony of William J. Clark and Mark E. Saltsman, Bates 012, Lines 5-6.

1 current and future, is therefore imperative in judging whether the estimated range
2 derived by the Company is reasonable or not.

3 **Q. What is the Company's position on how the RNG Agreement will impact the COG**
4 **for customers of EnergyNorth on the traditional pipeline system?**

5 A. In its original testimony, the Company did not conduct a sufficiently detailed
6 analysis as to how the accommodation of the RNG Dths will impact the COG for the its
7 existing customers (on the traditional pipeline system). While the Company conceded
8 that in summer the RNG will be displacing less expensive pipeline-only supplies, it
9 asserted that in winter RNG as a base load supply will displace more expensive
10 purchases, i.e. propane, LNG and spot gas. It concluded that the impact on existing Sales
11 Customers will be *de minimus*.¹²

12 **Q. Does the Company believe that the approval of the RNG Agreement is in the public**
13 **good?**

14 A. Yes. In reaching that conclusion, the Company touts the environmental and
15 sustainability benefits of the RNG Agreement, asserts that the RNG purchases "will have
16 a *de minimus* impact on customer bills even without TRECs," and concludes that "the
17 RNG purchase will be the lowest cost option for incremental supply on an annual basis
18 when revenue from TRECs is credited back to customers through COG." The Company

¹² Direct Testimony of William J. Clark and Mark E. Saltsman, Bates 12, Line 18 to Bates 13, Line 4.

1 also stresses the importance of sending a message to its customers that RNG is
2 economically viable.¹³

3

4 **III. OCA's Critique of EnergyNorth's Petition**

5 **Q. Briefly describe how this section is organized.**

6 A. The OCA's focus is largely financial. The OCA does not have a position on the
7 engineering and technical aspects of the Company's petition. We certainly expect that
8 Staff will carefully examine whether RNG, co-mingled with natural gas, can present gas
9 quality issues, which could have an effect on the financial viability of the proposed
10 arrangement. The gas-quality aspect may become an important part of this docket, but
11 the following financial analysis focused on ratepayers' interest is an equally if not more
12 important aspect of the docket. In providing this analysis, we intend to provide the
13 Commission a better understanding of the economic impact on the Company's
14 ratepayers if the Commission were to approve the petition. To answer that question, the
15 OCA relies on both (1) a detailed look at the impact on the traditional pipeline customers,
16 and (2) the implication of EnergyNorth being required to purchase the production facility
17 two years into the contractual period, if RUDARPA meets the MASQs in the first two
18 years. Subsection III.a focuses on the rate impact on traditional pipeline customers, and
19 Subsection III.b provides the OCA's position on the Production Facility Purchase clause
20 of the RNG Agreement.

¹³ Direct Testimony of William J. Clark and Mark E. Saltsman, Bates 18, Lines 2-6.

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III.a Impact on EnergyNorth's Existing Sales Customers

Q. Do you agree with the Company's contentions that the impact of the RNG procurement on customers' COG will be *de minimus* without TRECs, and that the procurement will be the lowest cost option for incremental supply on an annual basis with the TRECs?

A. While I agree that the impact of the RNG Agreement on customers' COG should be expected to be *de minimus*, I do not agree that the RNG procurement will be the lowest cost option for incremental supply on annual basis with the TRECs. Also, not trivially, even with respect to the point about *de minimus* impact on COG, that focus is, in the OCA's view, completely misplaced. Such a focus appears to rely on the premise that the supply cost associated with the RNG Dths (with or without adjustment for the expected TREC value) ought to be judged based on how it impacts the COG per Dth rate. The OCA does not agree with that premise. The focus should instead solely be on comparing: (1) the supply cost associated with the RNG Dths (adjusted for expected TREC value); and (2) the supply cost associated with the most expensive Dths those RNG supplies will replace on a daily, and then an annual basis. If the difference between the former and the latter is positive, the conclusion would be that the RNG procurement is not cost-effective or in the best interest of the Company's ratepayers. The issue of whether the impact on the COG is *de minimus* should not inform the reasonability of the RNG Agreement at all.

Q. Did the Company acknowledge the importance of comparing the RNG supply cost with the displaced highest-cost Dths in its testimony?

1 A. Yes, at least indirectly. The Company in discussing the cost implications for winter
2 stated that “[d]uring the summer COG period, the RNG will be displacing pipeline-only
3 supplies and will be an incrementally more expensive option. However, in the winter
4 COG period, as a baseload supply, the RNG will reduce purchases of propane, LNG, and
5 spot gas commodities which are more expensive than the RNG supply.”¹⁴ However, in
6 its analysis to determine whether the RNG Agreement is reasonable for its sales
7 customers, the Company compared the RNG supply cost with COG cost that not only
8 would include the supply cost of displaced Dths but also includes demand cost and
9 indirect cost. For a proper record on the cost-effectiveness of RNG supplies, it is
10 important that RNG supply cost be compared only with the supply cost associated with
11 the most expensive displaced Dths.

12 **Q. Did the OCA conduct any analysis comparing the RNG supply cost with only**
13 **the expected supply cost associated with the highest cost displaced Dths? If so, please**
14 **first discuss how that analysis is organized.**

15 A. Yes. The OCA recognizes that the comparison ideally ought to be based on
16 reasonably informed future expectations. To come up with such a comparison, the OCA
17 has relied on a hybrid estimate derived from a “historical” look at how RNG supplies
18 under the contractual pricing term would have fared over 2016-2018, *and* how it would
19 fare in the future based on natural gas futures associated with the Dracut pricing point
20 for 2019-2023. The analysis is largely informed by the Company’s response to OCA data

¹⁴ Direct Testimony of William J. Clark and Mark E. Saltsman, Bates 12, Line 20 to Bates 13, Line 2.

1 requests 1-3 and 1-4. For ease of exposition, what follows first is the “historical” look.
2 Subsequently, we discuss the “Dracut futures” oriented approach. Finally, both the
3 “historical” look and the “Dracut futures” oriented approach are combined to reasonably
4 estimate how the RNG supply cost is expected to compare with the displaced highest cost
5 supplies otherwise being relied on given EnergyNorth’s current portfolio.

6 **Q. Please discuss the “historical” look at how the contractual RNG supplies would**
7 **have fared over 2016-2018.**

8 A. In response to OCA data requests 1-4, the Company provided the daily RNG
9 production levels for 2016-2018. Since the Company expects little volatility in the daily
10 production level, it estimated the daily production for each and every day in a year by
11 dividing the annual production amount by the number of days in the year. The same
12 data requests also required the Company to provide the daily per Dth supply cost
13 associated with the most expensive Dths that displace the RNG Dths. Using the 2016-18
14 data provided by the Company it can be determined that annually the supply costs
15 associated with the most expensive displaced Dths for 2016, 2017 and 2018 were \$1.7
16 million, \$2.3 million, and \$2.7 million, respectively. Assuming that the RNG cost to be
17 \$9.93 per Dth and the realized TREC value is \$4.50 per Dth (consistent with what
18 essentially the Company projected), the RNG supply costs for 2016, 2017, and 2018 would
19 be \$2.68 million, \$2.95 million and \$2.89 million, respectively (See Schedule PKC-1), with

1 an adjustment for macroeconomic inflation over 2016 to 2018.¹⁵ Therefore, the annual
2 overpayment associated with the RNG procurement for years 2016, 2017, and 2018 would
3 have been approximately \$989,000, \$685,000 and \$208,000, respectively. Based on this
4 “historic” look, even with generous accounting for the credits for TRECs, the RNG
5 procurement would not be cost-effective. As a rough estimate, over three years,
6 EnergyNorth’s Sales Customers would have been worse off by 56 percent of
7 approximately \$1.9 million, i.e., \$1.05 million.¹⁶ The additional costs associated with
8 using RNG Dths, even after availing healthy TREC credits, would be approximately 28
9 percent higher than the cost associated with the most expensive Dths from 2016-2018.

10 **Q. Does the OCA have any further comments on the estimates discussed above?**

11 A. Yes. The Company’s limited analysis of the impacts of the RNG supply are a major
12 shortcoming of its proposal, and the more robust analysis provided above shows that—
13 even when utilizing conservative inputs meant to provide the project with the benefit of
14 the doubt—the RNG agreement is not a cost-effective supply strategy for EnergyNorth’s
15 ratepayers.

16 **Q. Please explain why the OCA believes that the inputs to the analyses above are**
17 **conservative.**

¹⁵ Given that the RNG per Dth pricing is estimated in 2018, one could reasonably assume that the RNG per Dth rate should be adjusted downwards 2 percent per annum for 2016, and 2017, relative to 2018, to properly derive the downside for the Sales Customers.

¹⁶ This estimate is predicated on the assumption that the break-up between special contract customers and Sales Customers will be the same every day. As discussed later, this provides a very conservative look at the burden faced by the EnergyNorth’s Sales Customers.

1 be the same every day. If [REDACTED] is unable to receive RNG Dths even beyond
2 the first year of the contract, the downside for EnergyNorth's Sales Customers will be
3 even more.

4 Third, the assumed value for TRECs is too generous. EnergyNorth does not currently
5 have the ability to sell TRECs. While they suggest a rule change (see response to Staff 3-
6 12) that would allow them to do so on behalf of its Sales Customers, it seems uncertain
7 that such a rule change will be in place in time per the Company's projected timeline.
8 Additionally, even if the rules are changed relatively quickly to enable EnergyNorth's
9 sale of TRECs on behalf of its Sales Customers, we contend that the TREC eligible RNG
10 production, at least in the early years, will significantly affect the supply of TRECs in the
11 TREC market.¹⁸ There is a distinct possibility that the TREC prices in the future will be
12 significantly lower than what is assumed in the analysis above. If the TRECs prices drop
13 significantly, the downside for EnergyNorth's Sales Customers will be significantly more
14 than what has been estimated above.

¹⁸ It is helpful to derive a back-of-the-envelope estimate of how the proposed RNG production backed incremental supply of TRECs compares with the total Class 1 Thermal RPS requirement in NH in 2020. It can be estimated that the annual Dths eligible for TRECs in 2020 – approximately commensurate with 1.6 percent of expected non-exempt 10.5 million MWh annual electricity sales in NH (rough estimate based on 2017 data) – is around 570,000 Dths. Based on EnergyNorth's estimates, the expected RNG production from the Bethlehem landfill in 2020 is 494,219 Dths (Company's Response to OCA 1-4, Attachment OCA 1-4). This analysis shows that the expected incremental TREC Dths from the Bethlehem landfill is a large proportion of the yearly TREC eligible Dths for 2020. The Dths from eligible TRECs will go up in the future as the RPS requirement for TRECs will increase to 2.2 percent in 2023. Even under that scenario, the expected incremental TREC-eligible Dths from the Bethlehem landfill will produce a significant downward pressure on TREC prices. The Company's assumption of a TREC credit of \$4.50 per Dth appears to be overly optimistic even under the 2.2 percent RPS requirement scenario.

1 **Q. Please discuss the basic elements of the forward-looking approach that relies on**
2 **Dracut's monthly futures to project future spot prices as a proxy for per Dth cost of the**
3 **most expensive Dths being replaced by the RNG Dths.**

4 A. The forward-looking approach relies on the Company's response to OCA's data
5 request 1-3.a. The Company provided monthly Forward NYMEX prices and Dracut
6 bases for January 2019 to December 2023. The sum of the NYMEX price and the Dracut
7 basis was used as a proxy for the daily per Dth cost of the most expensive Dths being
8 replaced by the RNG Dths for the months. As under the previous approach, the RNG
9 price is assumed to be \$9.93 per Dth, and the TREC value is assumed to be \$4.50 per Dth
10 for all years, 2019-2023.

11 **Q. Is your approach in projecting spot prices different from that relied on by the**
12 **Company? If so, please discuss how and why.**

13 A. Yes. While the Company has also projected spot prices for January 2019 to
14 December 2023, it basically scaled up the Dracut basis for winter months by 65 percent to
15 derive spot prices that were consistently significantly higher than what the market based
16 Forward prices would suggest for those winter months. The OCA disagrees with such
17 an ad hoc upward adjustment to the projected prices. Any expectation about the prices
18 rising during the days over a future winter month is already reflected in Dracut's
19 Forward monthly pricing. Particularly, in the context of the expectation that the RNG
20 production will be same every day in a year, it suffices to rely on the market-based
21 monthly Forward prices as average daily prices for the future months.

1 **Q. Are there issues with relying on this forward-looking approach that the OCA**
2 **would like to highlight? If yes, please discuss those issues.**

3 A. Yes. First, the forward-looking approach relying on the Dracut pricing point to
4 gauge expected pricing for the highest-cost Dths being replaced by the RNG Dths is
5 predicated on the expectation that highest-cost Dths are dictated by the monthly
6 demand/supply situation at the Dracut pricing point. The “historical” analysis indicates
7 that such an expectation is an oversimplification because the Company does not always
8 rely on the Dracut pricing point for its highest cost Dths.
9 Second, since the forward-looking approach uses data on Gas Forwards and Futures that
10 are sold monthly (not daily), the approach cannot have the same “daily” granularity as
11 was relied on under the “historical” approach, unless we develop a Monte Carlo
12 simulation to capture daily variations based on historical experience with weather.¹⁹ In
13 the absence of any modeling of expected weather pattern across days in a month
14 (especially winter months), the analytical findings that follow are less precise than those
15 obtained under the “historical” approach discussed previously. Nevertheless, it is
16 helpful to rely on the approach as it provides a glimpse into future market expectations,
17 as being borne by the Forwards and Futures market, and its implications for the viability
18 of the RNG purchases. Certainly, when weighed alongside the findings derived from the
19 “historical” approach, the forward-looking approach helps to provide a reasonable

¹⁹ In Docket DG 17-198, the Company relied on Monte Carlo simulation to model the pricing volatility over winter months using monthly Forwards and Futures data as well as an historical weather data.

1 insight into how the RNG Dths are expected to perform relative to current supplies, cost-
2 wise.

3 **Q. Please discuss how the contractual RNG supplies are expected to fare in 2019-2023**
4 **based on the forward-looking approach.**

5 A. Based on the assumptions that (1) the highest-cost Dths that the RNG Dths will
6 displace will be priced daily at the relevant monthly forwards' price for Dracut, (2) that
7 the RNG rate and the TREC value will pan out to be \$9.93 per Dth and \$4.50 per Dth,
8 respectively, and (3) assuming a daily RNG production level of 1500 Dths, the total cost
9 of the displaced Dths over the five years is \$13.6 million approximately (See Schedule
10 PKC-2). To purchase the same daily quantity as RNG supply would cost \$14.9 million
11 approximately (adjusted for assumed TREC values). The RNG Agreement, even
12 assuming an optimistic scenario for TREC credits, would cost sales customers 9.5 percent
13 more than what they currently pay for the commensurate highest-cost Dths.

14 **Q. Based on the "historical" and the "forward-looking" approaches, please summarize**
15 **the OCA's finding on the comparison between the RNG supply cost and the expected**
16 **cost of Dths being most economically displaced by the RNG Dths.**

17 A. The two analyses indicate that the RNG Agreement before the Commission for
18 approval is not cost-effective for EnergyNorth's Sales Customers, even under a fairly
19 optimistic scenario with respect to expectations about TRECs. While under the
20 "historical" approach the Sales Customers are worse off by \$1.05 million over three years,
21 under the "forward-looking" approach they are worse off by approximately \$724,000

1 over five years.²⁰ Given the limitations of the forward-looking approach, it is the OCA's
2 contention that the method provides an upwardly biased estimate of the cost associated
3 with the displaced Dths. The OCA contends that the "historical" approach provides a
4 better estimate of what EnergyNorth's ratepayers should expect with the RNG
5 Agreement being approved. Therefore, the OCA, based on its analyses above and an
6 expectation that the winter load will exceed the summer load for one of the special
7 contract customers, contends that the RNG Agreement will be to the detriment of Sales
8 Customers by at least a million dollars over the initial five years, even after optimistically
9 accounting for credits received from selling TRECs.

10

11 IIIb. EnergyNorth's Purchase of the RNG Production Facility

12 **Q. Please summarize your understanding of what the Company has agreed to with**
13 **respect to the trigger requiring its mandatory purchase of the RNG production facility**
14 **from RUDARPA.**

15 A. In response to data request OCA 1-1a., the Company confirmed that in the event
16 the RUDARPA exceeds or meets the MASQs for the first two years, EnergyNorth would
17 be bound to purchase the Production Facility under the terms described in Section 2.10
18 of the RNG Supply and Transportation Agreement. It is my understanding that the terms

²⁰ We again assume that uniformly 56 percent of the RNG Dths will be Sales Customers' burden every day. As noted previously, this simplifying assumption underestimates the disadvantage for EnergyNorth's Sales Customers. If we recognize [REDACTED] being predominantly a heating customer, with [REDACTED] percent and [REDACTED] percent of the RNG Dths being the Sales Customers' burden in summer and winter, respectively, we find that, with the "historical" approach, the Sales Customers will be worse-off by about \$1.2 million over 2016-2018, and with the "forward-looking" approach, they will be worse-off by \$1.2 million over five years.

1 described in Section 2.10 realistically provides the ability to *not* purchase the Production
2 Facility *only* if the MASQ clause mentioned above is not satisfied.

3 **Q. Does the OCA believe that the purchase clause that the Company is bound to**
4 **adhere to is reasonable? Please provide the reasons for the OCA's position.**

5 A. No. There are several reasons why the OCA contends that Production Facility
6 purchase clause is not in the best interest of ratepayers and the Commission should not
7 accept it.

8 First, there are significant uncertainties with respect to how the TREC value would trend
9 in the future as well as how the natural gas market would evolve in the future. Indeed,
10 given the current 2500 PUC rules, there is also the threshold question of whether
11 EnergyNorth can sell TRECs on behalf of its end users.

12 Second, there is also a degree of uncertainty regarding future RNG production levels
13 from the Bethlehem landfill, as well as any quality considerations that emerge from the
14 initial accommodation of RNG Dths into the Company's distribution system. Whether
15 the RNG purchases will be cost-effective well beyond the first two years of the transaction
16 between RUDARPA and EnergyNorth has not been demonstrated adequately by the
17 Company.

18 Third, even under fairly optimistic expectations about TREC values, the OCA's analysis
19 shows that the RNG Agreement would be detrimental to EnergyNorth's Sales Customers.
20 To properly determine the cost-effectiveness of the RNG Agreement, at the minimum,

1 data from the initial years (3-5 years) need to be properly analyzed. That analysis would
2 also require data on quality and safety attributes going forward.

3 Fourth, not trivially, one threshold question is why should a distribution utility like
4 Liberty Utilities (with no expertise in RNG operations) be allowed to increase its rate base
5 through a purchase of a RNG production facility, particularly when there are other
6 entities, that are potentially better able to manage the risks involved with such production
7 facilities, given their expertise. It is the OCA's position that Liberty Utilities, as a
8 distribution utility, should not have ownership interest in any gas production facility.

9 In short, given the record up to now, the OCA submits that the Company has not made
10 a compelling case for the conditionally mandatory purchase of the production facility.

11 The evidence, based on the OCA's analysis, suggests that not only is the purchase not
12 cost-effective even under fairly optimistic scenarios, it is also fraught with significant
13 uncertainties which may unnecessarily burden future ratepayers with stranded costs.

14 Even if the Commission were to look past the economic impacts and uncertainties and
15 approve a more limited contract for supply from this facility, we respectfully urge the
16 Commission to reject the RNG Agreement's Production Facility Purchase clause.

17

18 **IV. Concluding Remarks and OCA's Recommendations**

19 **Q. Before providing the OCA's recommendation, please summarize the findings**
20 **from the analyses above.**

1 A. The OCA finds that under the proposed terms the RNG Agreement is not cost-
2 effective for EnergyNorth's Sales Customers (that are predominantly residential) and
3 conservatively estimates it will be to the detriment of those customers by over a million
4 dollars over the next three years. The OCA also finds that the Company has not
5 adequately demonstrated why it's reasonable for Sales Customers to bear the burden of
6 an additional rate base well into the future through the purchase of the proposed RNG
7 Generation Facility.

8 **Q. What are the considerations that inform your recommendation below?**

9 A. First, the OCA disagrees that the standard for approving the RNG Agreement
10 should be whether the impact on the COG is *de minimus* or not. Given the scale of the
11 project relative to the Company's existing customer base, it is not a surprise that the
12 impact on the COG is expected to be *de minimus*. The standard for approving the RNG
13 Agreement should strictly be whether or not it is cost-effective for Sales Customers.
14 Second, the OCA believes that the sole reliance on MASQ requirements over the first
15 two years to trigger a mandatory \$12.5 million (plus buy-out fees) purchase of a RNG
16 generation facility, without a significantly more detailed cost-benefit analysis of the
17 future burden for ratepayers, is cavalier.

18 Third, to come to an informed recommendation, while the OCA commends the
19 Company for exploring non-traditional avenues for alternative supply, technical and
20 quality considerations with respect to how RNG supplies are integrated into the
21 distribution system and how that impacts Sales Customers, cannot be ignored. This

1 concern is not simply related to what would transpire in the first two years of the
2 contract, but also, what it means for Sales Customers well beyond the first two years,
3 especially, if EnergyNorth assumes the ownership of the RNG Production Facility.
4 Without a comprehensive record on how the technical and quality considerations
5 impact the economics of the project, it would be premature for the Commission to
6 approve the RNG Agreement.

7 **Q. Please provide the OCA's recommendation.**

8 A. At this time, without any evidence that the proposed purchase of RNG can be a
9 part of the optimal supply mix for EnergyNorth's Sales Customers, we recommend that
10 the Commission reject the RNG Agreement between EnergyNorth and RUDARPA. The
11 OCA agrees that encouraging reliance on *cost-effective* RNG is certainly a commendable
12 goal. Unfortunately, the evidence in this docket, in the nature of financial analysis, does
13 not show that accommodating RNG into the supply mix for EnergyNorth's Sales
14 Customers is cost-effective.

15 Three additional points are worth noting. First, in the event the Commission approves
16 the RNG Agreement, the OCA strongly urges the Commission to disallow EnergyNorth
17 from expanding its rate base through a purchase of the proposed RNG Generation
18 Facility. The OCA strongly believes that Liberty Utilities, NH, should stay solely
19 focused on its distribution business, and should not foray into gas generation business.
20 The later function is better handled by entities who specialize in the business of
21 renewable gas production (like RUDARPA).

1 Second, based strictly on the OCA's financial analysis (which does not purport to
2 capture gas quality and engineering aspects), it seems possible that Liberty Utilities' off-
3 pipeline franchises - provided there is considerable interest from special contract
4 customers for the RNG offering (including customers on the EnergyNorth's existing
5 pipeline system) - may provide reasonable opportunities to integrate cost-effective
6 RNG supplies into Liberty Utilities' supply portfolio. This docket, which is focused
7 mainly on EnergyNorth's existing pipeline-dependent Sales Customers, obviously lacks
8 the necessary details to definitively conclude to that effect.

9 Finally, it is worth pointing out that to the extent EnergyNorth can elicit interest from
10 specific special contract customers like the ones who have already signed LOIs with it,
11 the OCA does not object to the Company's selling of RNG to such customers at
12 mutually agreed upon terms as long as EnergyNorth's existing Sales Customers are not
13 required to cross subsidize them.

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

15 A. It does.