REDACTED

STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

Docket No. DG 15-XXX

LIBERTY UTILITIES (ENERGYNORTH NATURAL GAS) CORP.
D/B/A LIBERTY UTILITIES

Petition for Approval of Tennessee Gas Pipeline Company LLC Supply Path Precedent Agreement

PREFILED DIRECT TESTIMONY
OF
FRANCISCO C. DAFONTE

December 8, 2015

I. Introduction and Qualifications

Q. Please state your name and business address.

A. My name is Francisco C. DaFonte. My business address is 15 Buttrick Road, Londonderry, New Hampshire 03053. My current position is Vice President, Energy Procurement for Liberty Utilities Service Corp. In that capacity, I provide energy procurement services to Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities ("EnergyNorth" or the "Company").

Q. Please summarize your educational background, and your business and professional experience.

A. I attended the University of Massachusetts Amherst where I majored in Mathematics with a concentration in Computer Science. In the summer of 1985, I was hired by Commonwealth Gas Company (now NSTAR Gas Company), where I was employed primarily as a supervisor in gas dispatch and gas supply planning for nine years. In 1994, I joined Bay State Gas Company (now Columbia Gas of Massachusetts) where I held various positions including Director of Gas Control and Director of Energy Supply Services. At the end of October 2011, I was hired as the Director of Energy Procurement by Liberty Energy Utilities (New Hampshire) Corp.[1] and promoted to Senior Director in July 2013 and Vice President in July 2014. In this capacity, I provide gas procurement services to EnergyNorth.

[1] On May 17, 2015, all employees of Liberty Energy Utilities (New Hampshire) Corp. became employed by Liberty Utilities Service Corp.

Q. Are you a member of any professional organizations?

A. Yes. I am a member of the Northeast Energy & Commerce Association, the American Gas Association, the National Energy Services Association, and the New England Canada Business Council.

Q. Have you previously testified in regulatory proceedings?

A. Yes, I have testified in a number of proceedings before the New Hampshire Public Utilities Commission (the "Commission"), the Massachusetts Department of Public Utilities, the Maine Public Utilities Commission, the Indiana Utility Regulatory Commission, the Missouri Public Service Commission, the Georgia Public Service Commission, and the Federal Energy Regulatory Commission ("FERC").

II. Purpose and Organization of Testimony

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

A. The purpose of my testimony is to present to the Commission, for its review and approval, a Precedent Agreement between Tennessee Gas Pipeline Company, LLC ("Tennessee") and EnergyNorth, in which EnergyNorth will purchase firm transportation capacity on Tennessee's proposed project from the Marcellus Shale region in Pennsylvania to Wright, New York (the "Supply Path PA"). A map depicting the proposed route from Susquehanna County, Pennsylvania to Wright, New York (the "Supply Path Project") is included as Attachment FCD-1 to my testimony. As shown on FCD-1, the Supply Path Project will connect with Tennessee's natural gas pipeline that is proposed to extend from Wright, New York to the western portion of the Company's system near Nashua, New Hampshire (the

"Market Path Project").[2] The Supply Path PA, included as Attachment FCD-2 to my testimony, will provide the Company with the ability to transport natural gas directly from the Marcellus Shale region to Wright, New York, and in turn to New Hampshire, where it will be received into the Company's system.

My testimony provides the Commission with information about the terms and conditions of the Supply Path PA, why the Supply Path PA is the most cost-effective means of serving the Company's customers, the decision making process undertaken by the Company, which resulted in its decision to procure firm transportation from Tennessee along the Supply Path Project, and the benefits of the Supply Path PA to the Company's customers.

Q. Please summarize how the remainder of your testimony is organized.

A. The remainder of my testimony is organized into the following seven sections:

III. The Supply Path Project, the Supply Path PA, and EnergyNorth's Contracting Process: In this section, I provide an overview of the Supply Path Project, the negotiation process that led to the Supply Path PA, and the contract terms associated with the Supply Path Project.

IV. Timing of the Supply Path Project: In this section, I provide an overview of the timing of Tennessee's construction of the Supply Path Project and relevant regulatory approvals it must receive.

[2] The Commission recently approved the Company's Precedent Agreement with Tennessee to purchase firm transportation capacity for twenty years on the Market Path Project. *See* Order No. 25,822 (October 2, 2015) in DG 14-380.

V. Natural Gas Pipeline Development Considerations: This section contains a brief overview of the challenges of obtaining incremental natural gas transportation capacity via new, greenfield pipelines.

VI. EnergyNorth's Decision Making Process and Associated Results: In this section, I address EnergyNorth's overall resource portfolio goals and objectives, EnergyNorth's process used to acquire resources, and how the Supply Path Project meets those objectives.

VII. EnergyNorth's Demand Forecast: This section contains a discussion of the demand forecast for EnergyNorth and specific trends that are affecting that forecast.

VIII. Need For and Benefits from the Supply Path Project**:** In this section, I address the benefits of the Supply Path Project, including: diversification of natural gas supply sources; access to price signals that reflect the Marcellus/Utica supply basin prices; more liquid, proximate trading points; and the addition of more flexibility into the Company's portfolio. The results of these benefits are lower and more stable supply costs to EnergyNorth's customers.

IX. Conclusions**:** I summarize my conclusions related to the Supply Path Project and why the Supply Path PA is prudent and reasonable.

III. The Supply Path Project, the Supply Path PA, and EnergyNorth's Contracting Process

Q. Please provide a brief description of the Supply Path Project.

A. The Supply Path Project will consist of approximately 177 miles of pipeline traversing northeastern Pennsylvania and southern New York. Of the approximately 177 miles of

pipeline to be constructed, 42 miles consist of looping the existing Tennessee 300 Leg in Pennsylvania, and 135 miles of greenfield pipeline connecting the Tennessee 300 and 200 Legs, which is co-located with the route of the Constitution Pipeline. The looping of the existing Tennessee 300 Leg will consist of 36-inch diameter pipeline, while the new pipeline connecting the Tennessee 300 and 200 Legs will consist of 30-inch diameter pipeline. The facilities will also include modifications at Tennessee's existing compressor station at Station 319, as well as up to three new compressor stations on the greenfield segment of pipeline. The Supply Path Project is expected to enter service in November 2018, and will have an aggregate capacity of up to 1.2 Bcf per day.

Q. Please summarize the principal terms and conditions of the Supply Path PA.

A. On November 18, 2015, the Company entered into the Supply Path PA with Tennessee, which includes the following terms and conditions:

(1) Term: The Supply Path PA has an initial twenty-year term beginning on the later of November 1, 2018 or the date on which Tennessee is able to render service to EnergyNorth using the Supply Path Project facilities ("Commencement Date"). However, the Commencement Date [redacted] The agreement also grants the Company a Right of First Refusal to extend the term for an additional ten years.

(2) Maximum Daily Quantity ("MDQ"): Under the terms of the Supply Path PA, EnergyNorth has the option to reduce the Company's MDQ in the Supply Path PA from the Total Quantity ("TQ") of 115,000 Dth per day (i.e., the Company's MDQ

in the Market Path PA).[3] Based on the Company's SENDOUT® optimization modeling, and its evaluation of non-cost factors, EnergyNorth has elected to contract for an MDQ of 78,000 Dth per day on the Supply Path Project as stipulated in its letter to Tennessee dated November 20, 2015 and provided as Attachment FCD-3 to my testimony. As such, the Supply Path PA will provide EnergyNorth with up to 78,000 Dth per day of firm transportation service from one or more mutually agreeable receipt points on Tennessee's 300 Line in Zone 4 to Tennessee's existing Wright, New York ("Wright") delivery point.[4]

(3) Rate: The Company is required to pay a monthly Negotiated Reservation Rate, which shall be equal to a Base Negotiated Reservation Rate of [redacted] per Dth per month,[5] multiplied by the contracted MDQ.

(4) Path: The Supply Path Project consists of certain facilities including: (i) installation of up to 42 miles of 36-inch pipeline adjacent to Tennessee's 300 Line right of way in Pennsylvania; (ii) approximately 135 miles of greenfield 30-inch pipeline from Susquehanna County, Pennsylvania to Wright, New York; (iii) certain modifications to Tennessee's existing compressor station at Station 319 in Bradford County, Pennsylvania; and (iv) new compression facilities at up to three locations on the greenfield segment of the pipeline between mainline valve 320 and the existing Wright, New York point.

[3] The Company's MDQ in the Supply Path PA is subject to a maximum reduction of 40% of the TQ.
[4] Please note that the Wright, New York point is the receipt point for the Company's Market Path PA.
[5] If the monthly demand charge is expressed as a daily rate it equates to approximately $0.85 per day.

(5) One or Two Service Agreement Option: Under the terms of the Supply Path PA, EnergyNorth has the option to consolidate the Supply Path and Market Path agreements into a single service agreement to facilitate the nomination of natural gas deliveries and to simplify the administration of the contract. This option is consistent with Section 1(b) of the Market Path PA, which was approved by the Commission in Order No. 25,822 (October 2, 2015) in Docket DG 14-380.

(6) Enhanced Primary Receipt Point: The Supply Path PA provides EnergyNorth with the option of adding incremental primary receipt points at the interconnection between (i) Tennessee's Northern Storage facility where the Company would be able to access its full storage withdrawal capacity,[6] (ii) the Dominion Transmission system at Ellisburg, Pennsylvania and (iii) the National Fuel Gas Supply system at Rose Lake, Pennsylvania. These additional primary receipt points will provide access to the Company's existing natural gas storage service providers, as well as other natural gas storage facilities, and enhance the flexibility of the Supply Path Project.

(7) [redacted] on the Supply Path Project.

(8) [redacted]

[6] The Company currently has 21,844 Dth per day of withdrawal capacity but only 19,076 Dth per day of transportation capacity.

(9) [redacted]

Q. How was the Supply Path PA negotiated?

A. Similar to the Market Path PA process, EnergyNorth participated in a consortium consisting of natural gas local distribution companies ("LDCs"), all located in New England (the "LDC Consortium"). The LDC Consortium was able to negotiate as a group to obtain the best overall deal for the participating LDCs.

The benefits of this approach include pooling the collective needs of the participating LDCs to present a large block of committed, firm capacity that would underwrite construction of the Supply Path Project. Since this LDC Consortium represented the primary source of demand for the project, it was possible to gain more favorable benefits and lower negotiated rates than could have been obtained by each LDC negotiating individually. Those benefits can best be seen by the negotiated rates agreed to by EnergyNorth and Tennessee. That negotiated rate is [redacted] per Dth per month, or approximately [redacted] per Dth per day. The negotiated rate represents an approximately [redacted] discount to the expected recourse

[7] Project TQ refers to the total transportation quantity contracted for in gas transportation agreements on or before May 1, 2018 between Tennessee and all project shippers, including the LDC Consortium, for transportation service on the Supply Path facilities with a primary term of ten years or more and a Commencement Date of no later than November 1, 2018.

rate of [redacted] Dth per day. Stated differently, the expected recourse rate on the Supply Path Project would have increased the demand charge by more than [redacted] (*see* Table 1 below).

Table 1: Comparison of Negotiated & Recourse Rates

[redacted]

As illustrated by Table 1, the discount negotiated by the LDC Consortium, as part of the overall package, results in an annual savings to EnergyNorth customers of approximately $14 million. That discount in the demand charge is expected to save EnergyNorth's customers approximately $280 million over the twenty-year term of the Supply Path PA.

In addition to the discounted rate benefits, the LDC Consortium was able to negotiate other valuable benefits including:

[redacted]

(2) One or two service agreement option;

(3) an enhanced primary receipt point option;

(4) [redacted] and

(5) [redacted]

Q. Please describe the [redacted] identified above.

A. The [redacted] on the Supply Path Project. This [redacted] on the Supply Path Project should [redacted][8]

Q. What is meant by the one or two service agreement option identified above?

A. Subject to certain terms and conditions, the one or two service agreement option will permit EnergyNorth to effectively combine the Market Path PA and Supply Path PA into a single agreement, or to maintain the agreements as two separate agreements.[9] By combining the agreements into a single agreement, EnergyNorth will benefit from simpler administration and nomination of deliveries across the pipeline. However, by maintaining two separate agreements, EnergyNorth could benefit from the additional optionality and flexibility offered by separate nomination processes.

Q. What is the enhanced primary receipt point option?

A. The enhanced primary receipt point option would permit the shippers to receive natural gas from Tennessee's Northern Storage facility, the Dominion Transmission system at Ellisburg, Pennsylvania, and the National Fuel Gas Supply system at Rose Lake,

[8] Attachment FCD-2 at Pages C-1 – C-3. Subject to satisfaction of certain terms and conditions that ensure [redacted]

[9] *Id*. at Section 1(b)).

Pennsylvania.[10] These receipt points will provide additional natural gas procurement flexibility, as well as the ability to better optimize the resource portfolio.

Q. Why is it important to consider that EnergyNorth is not [redacted]

A. Similar to the Market Path PA, many pipelines under development include [redacted] For the Supply Path PA, EnergyNorth and the LDC consortium have effectively negotiated to [redacted]. As a result, EnergyNorth and its customers will not be subject to [redacted]

Q. Please describe the [redacted]

A. The [redacted] provides for a [redacted] and the total LDC Consortium [redacted][11] The Supply Path PA also provides subsequent [redacted][12]

[10] *Id*. at Section 5.

[11] *Id*. at Pages C-4 – C-5. In addition, the [redacted] of Tennessee's FERC Certificate Application.

[12] *Id*., at Page B-9. The [redacted]

Q. Can you explain why the MDQ on the Supply Path Project is lower than the MDQ on the Market Path Project?

A. Yes. EnergyNorth elected to contract for less firm capacity on the Supply Path Project to provide additional flexibility in its supply portfolio. By electing a lower capacity level, EnergyNorth will preserve the option to supply its customers from the Marcellus/Utica supply basins through released capacity from others, purchases at Wright, or via points upstream of Wright on Iroquois.

The decision to reduce the capacity on the Supply Path Project to less than the capacity on the Market Path Project was based on the Company's SENDOUT® optimization modeling, and its evaluation of non-cost factors, which suggested that the best cost option for its customers was a contract volume of 78,000 Dth per day.

Q. Did EnergyNorth conduct any analysis of available capacity and purchase options prior to entering into the Supply Path PA?

A. Yes. Prior to entering into the Supply Path PA, EnergyNorth conducted a comprehensive analysis of available capacity and purchase options. That analysis is described in Section VI of my testimony. The results of those analyses support the following conclusions that the Supply Path Project will:

(1) Provide cost effective natural gas supply for EnergyNorth's customers;

(2) Provide direct access to the Marcellus/Utica supply basins;

(3) Provide an option to access numerous production area storage facilities and storage optimization-related benefits;

(4) Enhance the diversity of the EnergyNorth resource portfolio;

(5) Lead to greater price stability; and

(6) Enable other supply options within the EnergyNorth resource portfolio.

IV. Timing of the Supply Path Project

Q. What assurances does EnergyNorth have that the Supply Path Project will be constructed?

A. Tennessee, the sponsor of the Supply Path Project, is an indirect subsidiary of Kinder Morgan, Inc. ("Kinder Morgan"). Kinder Morgan is not only the largest natural gas pipeline operator in the U.S., it is also the largest energy infrastructure company in the U.S.[13] As a result, EnergyNorth is confident that Kinder Morgan and Tennessee have the wherewithal to complete the Supply Path Project. [redacted].[14]

[13] SNL Financial, LLC. Kinder Morgan, Inc. has a market capitalization of approximately $67 billion and a total enterprise value of approximately $112 billion. The company is rated Baa3 by Moody's Investor Service, BBB- by Standard & Poor's Ratings Service, and BBB- by Fitch Ratings.

[14] Attachment FCD-2 at Section 13(c). EnergyNorth is required to provide [redacted]

Q. What primary regulatory protection exists in the Supply Path PA to ensure EnergyNorth and its customers are protected in the event that the Supply Path Project is not constructed as expected?

A. EnergyNorth has the right to terminate the Supply Path PA at no cost to its customers if EnergyNorth has not received the requisite approvals from the Commission by May 2, 2016.[15]

Q. What is the proposed schedule for the Supply Path Project?

A. Tennessee submitted a FERC Pre-Filing Application on September 15, 2014. In the 4th quarter 2015, Tennessee expects to file a Certificate Application with the FERC, with the expected approval of that application anticipated in the 4th quarter 2016. Tennessee will commence construction activities in January 2017, or upon receipt of the approval of the FERC Certificate Application. Finally, the Supply Path Project is expected to enter service in November 2018.

V. Natural Gas Pipeline Development Considerations

Q. What considerations impact the development of new natural gas pipelines and should be considered by the Commission?

A. The development and construction of large-scale natural gas pipeline projects requires the investment of hundreds of millions or billions of dollars. Given the significant investment associated with a new project, and the long useful life of the facilities, natural gas transmission owners and operators seek to establish long-term contracts with shippers that

[15] *Id*. at Section 7(b).

assure recovery of the construction, financing, and operating costs of the new pipeline. These customers, often referred to as anchor shippers, receive substantial benefits, which may include:

(1) Negotiated rates that are below the recourse (i.e., cost of service) rate;

(2) Most Favored Nation status, such that, if similarly situated parties negotiate benefits or pricing better than the anchor shipper, the anchor shipper will receive the same benefit or pricing; and

(3) First rights of refusal on expansion or renewal capacity.[16]

In exchange for providing these benefits and rights to anchor shippers, the natural gas pipeline developer receives the necessary volume commitments to support the project. Natural gas transmission owners and operators seldom undertake new construction without this sufficient volume commitments, which are vital to the overall cost recovery of the project.

Additionally, the interstate natural gas transportation system lacks a reliability planning body, similar to the regional Independent System Operators for the electric transmission system, that determines when power generation capacity is permitted to retire and when new transmission lines are required. Therefore, it is incumbent on each LDC to adequately subscribe to natural gas transmission projects to support construction of sufficient capacity to serve their customers. Absent commitments from potential shippers, pipeline developers

[16] As discussed in Section III, all of the benefits noted above are included in EnergyNorth's Supply Path PA as a result of the approach employed by EnergyNorth in negotiating the Supply Path PA with Tennessee.

generally do not move forward with projects. As a result, it is crucial for firm shippers, such as EnergyNorth, to subscribe to new projects that meet the needs of its customers.

VI. EnergyNorth's Decision Making Process and Associated Results

Q. Please explain EnergyNorth's resource planning objectives.

A. As detailed in the 2013 EnergyNorth Integrated Resource Plan ("IRP"), which was approved by the Commission in Order No. 25,762 (February 9, 2015) in Docket DG 13-313, EnergyNorth pursues a best-cost resource portfolio that considers the reliability of the supply and transportation resources while seeking to achieve the lowest possible customer cost.[17] EnergyNorth's resource planning objectives are summarized as follows:

- Maintain portfolio reliability (which includes enhancing diversity across pipelines and supply basins);
- Reduce supply costs;
- Increase or maintain portfolio flexibility; and
- Acquire viable resources.[18]

These objectives are informed by the pipeline development process and recognize that long-term incremental capacity often cannot be acquired in the short-term or in the exact quantity desired.

[17] EnergyNorth Natural Gas, Inc. Integrated Resource Plan (November 1, 2013 - October 31, 2018), Docket DG 13-313, at 12.

[18] *See* DaFonte Direct Testimony, Docket DG 14-380, at 27.

Q. Is the Supply Path PA consistent with those objectives?

A. Yes, it is. Similar to the Market Path PA, the Supply Path PA is a package of benefits and obligations negotiated by the LDC Consortium that are more advantageous than those that could have been negotiated on a stand-alone basis.

The Supply Path PA will enhance the reliability of EnergyNorth's gas supply portfolio, while increasing overall price stability by allowing EnergyNorth to purchase up to 78,000 Dth per day of natural gas supply directly in the Marcellus and Utica supply basins. As such, EnergyNorth will further diversify the supply feeding the Market Path Project capacity. As described in Section VIII, the Appalachian supply basin, including the Marcellus and Utica shales, is quickly growing to become the largest production basin in North America.

The proposed Supply Path PA would provide additional benefits to EnergyNorth because it will give the Company direct access to Marcellus and Utica natural gas supplies and pricing points (e.g., the Leidy price index, which is a proxy for Tennessee Zone 4 300 Leg supply). Specifically, the Supply Path PA would allow the Company to benefit from the potential cost savings associated with production area purchases on the Tennessee 300 Leg, instead of purchases at Wright, New York (e.g., Iroquois Zone 2 ("IROZ2") as a proxy for natural gas supplies at Wright).

Q. Why was IROZ2 chosen as a proxy for natural gas supplies at Wright?

A. The IROZ2 price index is defined by SNL Financial[19] as: "The segment of Iroquois Gas Transmission that begins at Wright, New York, crosses the southwestern portion of Connecticut, and then crosses under Long Island Sound to terminate on Long Island." In addition, the IROZ2 price index is used by the New York Independent System Operator's Market Monitor as a proxy for natural gas prices in the Capital Zone, which covers the load zone in the eastern part of the state and includes Wright, New York in Schoharie County.

Q. Please describe the process that was used to identify the Supply Path Project as a preferred option to access natural gas supplies from the Marcellus/Utica supply basins.

A. Following the decision to acquire capacity on the Market Path Project, EnergyNorth began an evaluation of potential cost savings that could be obtained for EnergyNorth's customers by procuring transportation capacity upstream of the Market Path Project (i.e., between the Marcellus/Utica natural gas basins and the interconnection with the Market Path Project at Wright, New York). Based on the results of that analysis, EnergyNorth determined that it was in the interest of its customers to explore the firm transportation options available to access natural gas supplies in the Appalachian supply basin (i.e., Marcellus/Utica shales). EnergyNorth identified two potential options to procure firm transportation capacity to Wright, New York: (i) the Constitution Pipeline and (ii) the Supply Path Project.

[19] The Company relied on SNL Financial, LLC for all historical and forward pricing data referenced throughout its testimony.

Q. Please provide a brief description of the Constitution Pipeline project.

A. The Constitution Pipeline is sponsored by the Williams Companies, Cabot Oil & Gas, Piedmont Natural Gas, and WGL Holdings. The project consists of approximately 124 miles of new, greenfield pipeline between Susquehanna County, Pennsylvania and the Iroquois Gas Transmission ("Iroquois") and Tennessee systems in Schoharie County, New York. Once completed in 2016, the Constitution Pipeline will be capable of transporting 650,000 Dth per day.[20] All 650,000 Dth per day of capacity on the Constitution Pipeline is currently subscribed by a combination of Cabot Oil & Gas (500,000 Dth per day) and Southwestern Energy Company (150,000 Dth per day). Since Cabot Oil & Gas and Southwestern Energy Company have contracted for all the capacity on the Constitution Pipeline, EnergyNorth did not consider this alternative as a viable alternative for the Supply Path Project.

Q. Please describe the SENDOUT® analyses performed by EnergyNorth to evaluate the Supply Path Project.

A. EnergyNorth evaluated three scenarios for the Supply Path PA, including the following: (i) zero transportation capacity between the Marcellus/Utica supply basins and Wright, New York (e.g., effectively purchasing 100% of the supply for the Market Path Project from shippers on Iroquois, Constitution Pipeline, and the Supply Path Project at Wright), (ii) 115,000 Dth per day of capacity between the Marcellus/Utica supply basins and Wright (e.g., effectively contracting for the maximum TQ under the Supply Path PA and

[20] http://constitutionpipeline.com/, accessed September 29, 2015.

purchasing 100% of the supply in Marcellus/Utica), and (iii) a Resource Mix optimization run in which SENDOUT® solves for the optimum (i.e., least cost) capacity level between the Marcellus/Utica supply basins and Wright, New York. In addition, the Company developed a volume scenario using the output of the SENDOUT® Resource Mix scenario (rounded to 78,000 Dth per day) to confirm the results. The results of each of these scenarios can be found in Attachments FCD-4, FCD-5, FCD-6, and FCD-7, respectively.

For each Supply Path PA volume scenario, EnergyNorth performed detailed cost simulations using SENDOUT® over a twenty-four year period beginning November 1, 2014. This period was utilized as it is similar to the time period used to assess the Market Path PA and reflects the duration of the initial term of the Supply Path PA. Due to the assumed in-service date of November 1, 2018, SENDOUT® was used to calculate the total portfolio cost over the twenty-year period from November 1, 2018 through October 31, 2038 for each Supply Path PA volume scenario analyzed.

Q. **What key assumptions were made regarding the volume and pricing inputs for the SENDOUT® analyses?**

A. As discussed, the objective of the SENDOUT® analysis for the Supply Path Project was to address two questions: (i) identify if contracting on the Supply Path Project would benefit EnergyNorth customers; and (ii) determine a reasonable volume level for the Supply Path PA. Therefore, the focus of the SENDOUT® analysis is the price benefit of purchasing natural gas supplies in the supply area (i.e., the Leidy index) as compared to

purchases at Wright, New York (i.e., the origination point of the Market Path Project capacity).

The Company used two key assumptions regarding the pricing inputs for the SENDOUT® analysis. First, given the daily price/basis volatility observed in the historical natural gas price/basis analysis discussed in Section VIII, the Company developed daily pricing for the supplies in the Marcellus and Utica production area (i.e., Leidy) and at the origination point of the Market Path Project at Wright, New York (i.e., IROZ2).

In addition, the Company developed a price multiplier to model the impact of weather on the pricing inputs. As discussed in Section VIII, over the November 1, 2011 to June 30, 2015 time period, the production area price indices (e.g., Leidy) were relatively flat compared to Henry Hub regardless of weather; however, weather impacted the natural gas price and basis levels in certain downstream indices (e.g., IROZ2).

Q. Please elaborate on the price multiplier that was developed.

A. Given the objective of the analysis (i.e., Supply Path PA volume level), the price differences between IROZ2 and Leidy needed to be analyzed and modeled. In addition, the influence of winter weather on the price spreads needed to be included in the analysis. The daily price multiplier developed by the Company addressed the price differences between IROZ2 and Leidy over various HDD levels. First, the Company compiled daily weather (i.e., HDD) data for the EnergyNorth service territory (i.e., KMHT)[21] and daily

[21] KMHT is the Manchester Regional Airport.

IROZ2 and Leidy spot prices over the November 1, 2011 to June 30, 2015 period. In addition, the Company developed a daily structured Wright price.[22] Next, the Company determined the daily price multiplier by dividing the daily IROZ2 spot price by the daily structured price at the Wright, New York point. Finally, the Company developed HDD level ranges, and determined the price multiplier for each HDD level range as the simple average of the daily price multipliers. Table 2 summarizes the average prices and price multiplier for each grouping of HDDs used in the SENDOUT® analysis.

Table 2: Price Multiplier

KMHT HDDs	Avg. IROZ2 Spot Price	Avg. Structured Wright Price	Avg. IROZ2/Wright Price Multiplier
60 - 64	$ 20.52	$ 4.03	5.1
50 - 59	$ 19.10	$ 4.62	4.0
40 - 49	$ 12.39	$ 4.69	2.6
30 - 39	$ 5.64	$ 4.49	1.3
20 - 29	$ 4.58	$ 4.18	1.1

As shown in Table 2 above, at HDD levels between 60 and 64, the average IROZ2 price is approximately 5.1 times higher than the structured price at the Wright, New York point; at HDD levels between 50 and 59, the price multiplier is approximately 4.0; at HDD levels between 40 and 49, the price multiplier is approximately 2.6 times; at HDD levels between

[22] The structured Wright price was calculated as the Leidy price index plus the calculated demand charges associated with the transportation path from Marcellus to Wright (i.e., Constitution Pipeline). For example, the structured Wright price in December was the daily Leidy spot price plus $1.68/MMBtu. This approach is the same methodology utilized by the Company to calculate the structured Wright price in Docket DG 14-380 (i.e., in the evaluation of the Market Path Project).

30 and 39, the price multiplier is approximately 1.3 times; and finally, at HDD levels between 20 and 29, the price multiplier is approximately 1.1 times.

Q. What are the results of the SENDOUT® analyses performed by EnergyNorth?

A. Table 3 below summarizes the results of the SENDOUT® analyses for the four volume scenarios with the inclusion of the price multiplier.

Table 3: Summary of SENDOUT® Results

Volume Scenario	Supply Path Volume (Dth/day)	Total Costs ($000)	Capacity Release ($000)	Net Costs ($000)
(1) Supply Path = 0K (All Purchases at Wright)	0	$4,228,254	$130,513	$4,097,742
(2) Supply Path = 115K	115,000	$3,933,818	$250,087	$3,683,731
(3) Resource Mix	78,080	$3,764,439	$165,223	$3,599,216
(4) Resource Mix (Rounded Volume Level)	78,000	$3,764,153	$164,771	$3,599,382

As illustrated in Table 3 above, the option to purchase all of the Market Path PA supplies at Wright, New York (i.e., Volume Scenario 1) is the most expensive option, with a net cost of approximately $4.1 billion over the analysis period. However, if the Supply Path PA capacity is equal to the Market Path PA capacity (i.e., Volume Scenario 2), the net cost is reduced to approximately $3.7 billion (i.e., a savings of approximately $400 million) over the analysis period. Finally, if the Resource Mix module in SENDOUT® is utilized, the optimal Supply Path volume is 78,080 Dth per day (i.e., Volume Scenario 3), resulting in a net cost of $3.6 billion over the analysis period. Stated differently, Volume Scenario

3 (i.e., the Resource Mix volume) represents a savings of approximately $500 million, compared to Volume Scenario 1 (i.e., no capacity on the Supply Path project), and a savings of approximately $85 million compared to Volume Scenario 2 (i.e., the Supply Path volume equal the Market Path volume). In Volume Scenario 4, the Company rounded the Resource Mix volume level of 78,080 Dth per day to 78,000 Dth per day. Similar to Volume Scenario 3, the rounded Resource Mix volume (i.e., Volume Scenario 4) results in a net cost of approximately $3.6 billion over the analysis period. Therefore, based on the results of the SENDOUT® analysis, a Supply Path PA volume of 78,000 Dth per day is the optimal rounded volume level.

VII. EnergyNorth's Demand Forecast

Q. Why did EnergyNorth begin its evaluation with an analysis of the cost-effectiveness of natural gas purchases within the Appalachian supply basin rather than a discussion of the demand forecast?

A. The Supply Path PA is distinct from most firm transportation agreements considered by EnergyNorth. While most pipeline projects would be premised on the supply of incremental transportation capacity to the EnergyNorth system to meet demand, the Supply Path PA is, instead, focused on providing the lowest cost natural gas supplies to EnergyNorth's customers. This was one of the options that was enabled by entering into the Market Path PA.

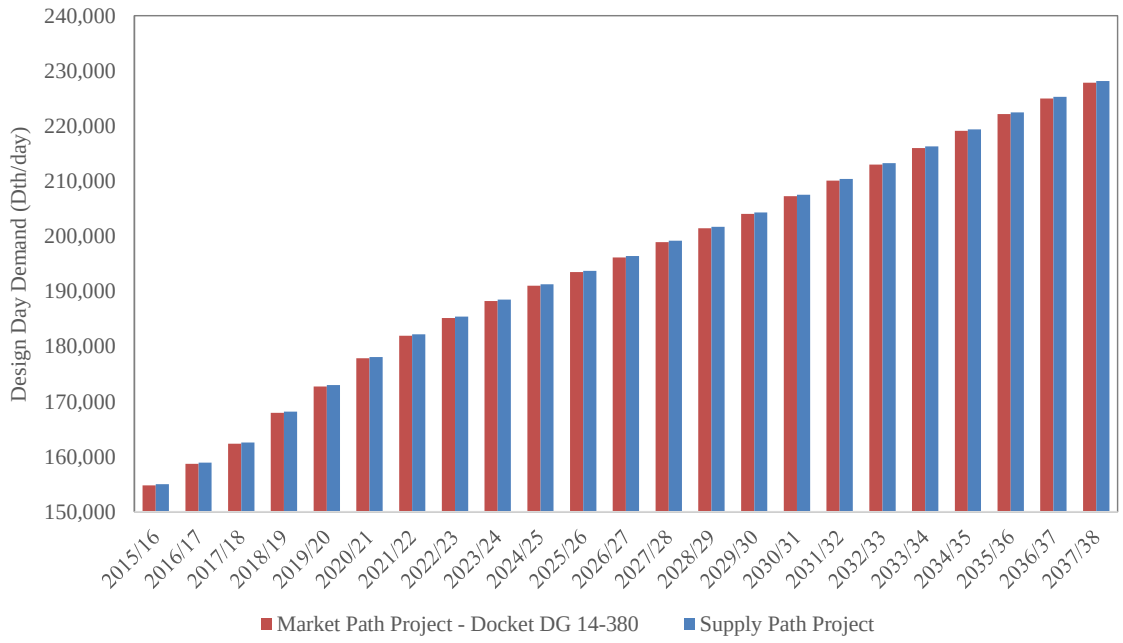
More specifically, the Supply Path PA will provide EnergyNorth with access to more liquid, proximate trading points that can lower the cost of natural gas supplied to

EnergyNorth's customers. As a result, the benefits from the Supply Path PA are derived from lower cost natural gas purchases, rather than the need to provide additional capacity to satisfy EnergyNorth's firm customer requirements. Stated differently, the Supply Path PA does not increase the deliverability to EnergyNorth's service area; rather, it more efficiently utilizes and optimizes resources already in the portfolio.

Q. Did EnergyNorth conduct a demand forecast for this application?

A. Yes. Because the demand forecast is a primary input into the SENDOUT® model, EnergyNorth examined the demand forecast previously provided in the Market Path PA filing in Docket DG 14-380 in response to Staff Tech – 23 (Revised). In doing so, EnergyNorth developed a demand forecast in which the out-of-model adjustments from the Market Path PA filing are now captured as part of the demand model and associated forecast. As illustrated by Figure 1, other than the consolidation of these out-of-model adjustments, there is no difference between the Design Day demand forecast in the response to Staff Tech – 23 (Revised) in Docket DG 14-380 and the Design Day demand forecast used in this application.

Figure 1: EnergyNorth Demand Forecasts



It is important to note that EnergyNorth did not enter into the Supply Path PA primarily to meet incremental demand, but, instead, to lower costs to our customers by displacing higher cost supplies.

Q. Please describe the demand forecast process used to determine the firm gas requirements for EnergyNorth's customers.

A. To develop the present demand forecast, EnergyNorth relied on the same forecast methodology that was approved in the Company's most recently approved IRP (i.e., Docket DG 13-313) and the Market Path PA filing (i.e., Docket DG 14-380).

Q. What factors, if any, are influencing EnergyNorth's demand forecast?

A. Consistent with EnergyNorth's filings in Dockets DG 13-313 and DG 14-380, the Company's demand forecast continues to be influenced by three primary factors including:

(i) continued customer growth, including the potential to convert the Keene Division propane system to natural gas service and expansion into unserved communities, (ii) the continued reverse migration of capacity-exempt customers to sales service, and (iii) a special contract with a new, large industrial customer known as iNATGAS that will be selling compressed natural gas ("CNG").

VIII. Need For and Benefits from the Supply Path Project

Q. Please provide the context for why purchasing firm transportation capacity from the Appalachian supply basin is cost effective for EnergyNorth's customers.

A. The Appalachian supply basin, and its two largest natural gas plays (i.e., the Marcellus and Utica shales), are fundamentally reshaping the North American natural gas industry. As a result of increasing production in this region and limited takeaway capacity, the price of natural gas in the Appalachian supply basin is the lowest in North America. Thus, despite incremental pipeline capacity charges to transport Marcellus and Utica supplies to the Market Path PA capacity, it is still a lower cost than alternative natural gas price points.

Q. Please discuss the historical basis trends between IROZ2 and Leidy.

A. In Table 4 below, the average daily IROZ2 (as a proxy for Wright, New York) and Leidy (as a proxy for Marcellus/Utica gas supplies) price indices are compared to the average daily prices at the benchmark Henry Hub price index over the 2011/2012 to 2014/2015 winter periods. The Leidy winter price index was relatively flat to Henry Hub in the winters of 2011/2012 and 2012/2013; however, the basis differential between Leidy and Henry Hub has increased over the past two winters (i.e., 2013/2014 and 2014/2015), and

the Leidy price index is now at a discount of approximately $1.50/MMBtu to Henry Hub. In contrast, over the past three winters (i.e., 2012/2013 through 2014/2015), the IROZ2 to Henry Hub basis differential has ranged from a premium of approximately $3.60/MMBtu to as high as $7.80/MMBtu.

Table 4: Historical Regional Basis Differentials

Split-Yr (Nov-Oct)	Winter (Nov-Mar) IROZ2-Henry Hub	Leidy-Henry Hub	Leidy-IROZ2
2011/2012	$ 1.01	$ 0.17	$ (0.84)
2012/2013	$ 3.67	$ (0.03)	$ (3.70)
2013/2014	$ 7.80	$ (1.00)	$ (8.80)
2014/2015	$ 3.80	$ (1.48)	$ (5.27)
Historical Avg. (2011/12-2014/15)	**$ 4.07**	**$ (0.58)**	**$ (4.65)**

Since the IROZ2 winter price is a positive basis differential (i.e., premium) to Henry Hub and the Leidy winter price is a negative basis differential (i.e., discount) to Henry Hub, the price benefits of purchasing natural gas at the Leidy price index can be illustrated by subtracting the Leidy basis from the IROZ2 basis. For example, as shown in Table 4, in 2014/2015 the winter price spread between IROZ2 and Leidy was $5.27/MMBtu. In other words, natural gas purchases at the Leidy price index during the winter of 2014/2015 were $5.27/MMBtu cheaper than buying natural gas at the IROZ2 price index.

Q. What are the forecasted price and basis trends for Leidy and IROZ2?

A. Forward prices indicate that the Leidy price index will remain at a discount to Henry Hub. Specifically, as shown in Table 5, the average winter basis between Leidy and Henry Hub is approximately -$1.14/MMBtu over the 2015/2016 to 2017/2018 time period. In contrast,

the forward prices indicate that supplies at Wright (e.g., IROZ2) remain at a premium of almost $3.50/MMBtu in the winter. Therefore, production area supplies (e.g., Leidy) will continue to be cost effective. Specifically, by comparing the forward price basis differential for IROZ2 and Leidy, winter purchases of natural gas at the Leidy price index are expected to be $4.62/MMBtu lower than winter purchases at the IROZ2 price index.

Table 5: Historical and Forecasted Regional Basis Differentials

Split-Yr (Nov-Oct)	Winter (Nov-Mar)		
	IROZ2-Henry Hub	Leidy-Henry Hub	Leidy-IROZ2
2011/2012	$ 1.01	$ 0.17	$ (0.84)
2012/2013	$ 3.67	$ (0.03)	$ (3.70)
2013/2014	$ 7.80	$ (1.00)	$ (8.80)
2014/2015	$ 3.80	$ (1.48)	$ (5.27)
Historical Avg. (2011/12-2014/15)	**$ 4.07**	**$ (0.58)**	**$ (4.65)**
2015/2016	$ 3.69	$ (1.31)	$ (4.99)
2016/2017	$ 3.43	$ (1.11)	$ (4.54)
2017/2018	$ 3.34	$ (1.00)	$ (4.34)
Forward Avg. (2015/16-2017/18)	**$ 3.48**	**$ (1.14)**	**$ (4.62)**

To place the basis differentials in perspective, EnergyNorth calculated the potential gas supply cost savings from the Supply Path PA. As shown in Table 6 below, at an estimated capacity cost of [redacted] per Dth per day, the Supply Path PA is expected to have an annual cost of capacity of approximately [redacted] million. These capacity costs are more than offset by the potential savings from using the average winter forward basis differential between Leidy and IROZ2.

Table 6: Supply Path PA Savings

Specifically, by applying the average winter forward basis differential to the Supply Path PA capacity over the winter period results in a savings of approximately $54.4 million, or a net savings relative to the total annual cost of the Supply Path PA of approximately [redacted] million. This calculation does not include capacity mitigation activities or portfolio optimization amounts.

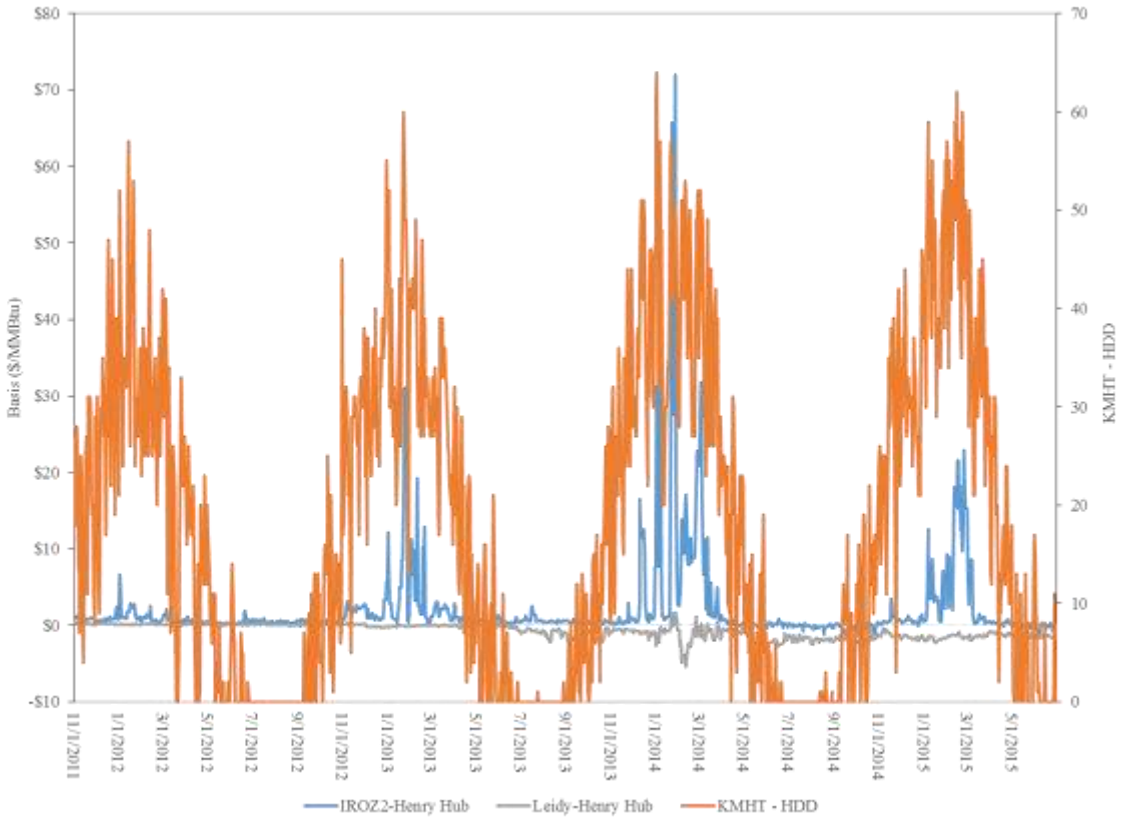
Q. How has weather affected the prices and basis differentials at Leidy and IROZ2?

A. To analyze the impact of weather on natural gas prices, the Company reviewed the daily weather (i.e., HDD) data for the EnergyNorth service territory (i.e., KMHT)[23] and the daily basis differentials for Leidy and IROZ2 relative to Henry Hub over the November 1, 2011 to June 30, 2015 time period. Specifically, as shown in Figure 2, for each day in the time

[23] KMHT is the Manchester Regional Airport.

period reviewed, the HDD at KMHT is compared to the basis between: (i) IROZ2 and Henry Hub; and (ii) Leidy and Henry Hub.

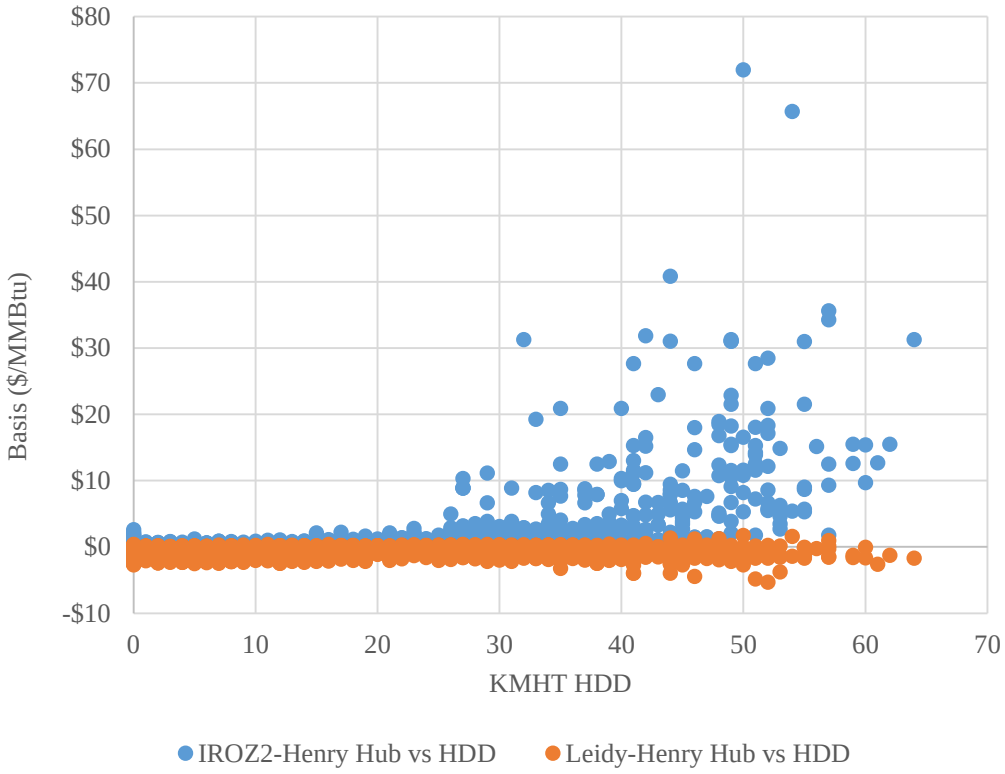
Figure 2: Regional Basis Differential Relative to Manchester Weather



As illustrated in Figure 2, the Leidy basis to Henry Hub has been relatively flat to Henry Hub regardless of HDD level; while, the IROZ2 to Henry Hub basis has exhibited more volatility with prices spiking during high HDD levels.

To better illustrate the relationship between the price volatility at the IROZ2 and Leidy price indices and weather, Figure 3 is a scatterplot of the daily weather (i.e., KMHT HDDs) and basis differentials for Leidy and IROZ2 relative to Henry Hub.

Figure 3: Regional Basis Differentials Relative to Manchester Weather



As illustrated in Figure 3, higher levels of HDDs increases the utilization of the pipeline grid which results in a higher probability of significant basis premiums in the downstream indices (e.g., IROZ2); however, the production area indices (e.g., Leidy) show less basis volatility.

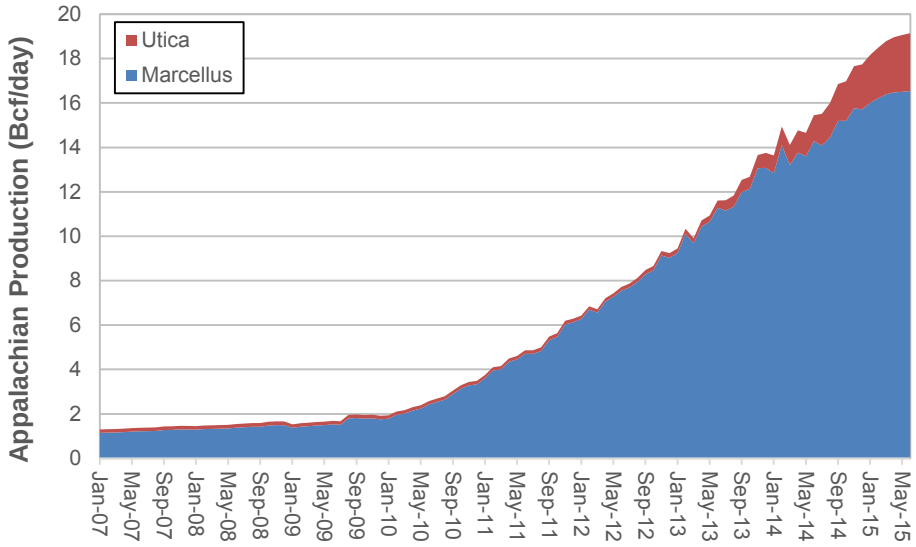
Specifically, as HDDs reach a level greater than 25 HDDs, there is a higher likelihood of price spikes and sustained basis premiums at the IROZ2 price index as compared to the Leidy price index. Given the higher basis values at the IROZ2 index compared to the stability of the Leidy index, particularly during the winter season, EnergyNorth's

customers would benefit from natural gas purchases at the Leidy index relative to purchases at the IROZ2 index.

Q. Is the increased production that has supported the lower basis differentials in the Appalachian supply basin expected to continue?

A. Yes, it is. Figure 4 below depicts the increase in production from the Marcellus and Utica shales from 2007 through May 2015.

Figure 4: Marcellus/Utica Production (2007 – May 2015)[24]

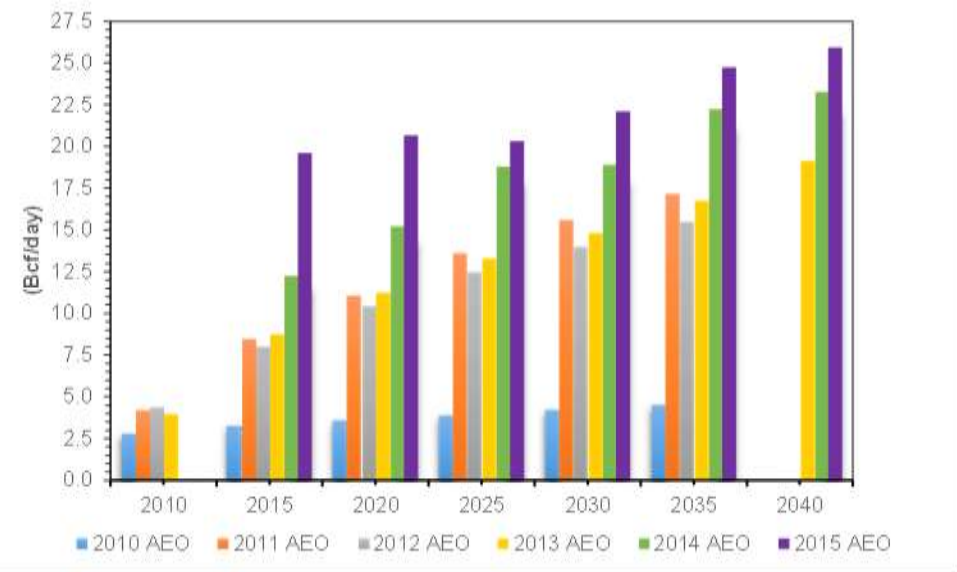


As illustrated in Figure 4 above, aggregate production in the Marcellus and Utica regions was approximately 1.5-1.75 Bcf per day in 2007. By May 2015, the aggregate production reached approximately 19 Bcf per day, with approximately 16 Bcf per day from the Marcellus basin.

[24] U.S. Energy Information Administration, Drilling Productivity Report, July 2015.

Going forward, expectations are for sustained or increased production from the Marcellus and Utica shales. In fact, and as shown in Figure 5 below, the projections of production from this region have increased significantly since 2010.

Figure 5: EIA Marcellus/Utica Production Forecast (2010-2040)[25]



As shown in Figure 5 above, in 2010 the U.S. Energy Information Administration ("EIA") was projecting sustained production between approximately 2.5 and 4.5 Bcf per day between 2015 and 2035. By 2015, the EIA expectations had increased substantially to approximately 20 Bcf per day in 2015 to more than 25 Bcf per day by 2035, or increase of approximate 700% and more than 450%, respectively from EIA's expectations in 2010.

[25] U.S. Energy Information Administration, Annual Energy Outlooks (2010-2015).

Q. Are there other signals that suggest the production from the Marcellus and Utica basins will continue?

A. Yes, there are several, including a recent estimate from the Potential Gas Committee ("PGC") regarding the potential resources available in the Appalachian region, as well as the fact that natural gas pricing services are creating new price indices to capture the price dynamics of the Marcellus region.

Q. Please describe the estimates of potential resources in the Marcellus and Utica regions.

A. With regard to the estimates of the potential resources from the Marcellus and Utica regions, the PGC, a research institute affiliated with the Colorado School of Mines, provides an estimate of potential resources in the Atlantic region, which includes the Marcellus and Utica shales, that fall within three categories of resources:[26]

(1) Probable resources are discovered but unconfirmed resources associated with known fields and field extensions, and undiscovered resources in new pools in both productive and nonproductive areas of known fields;

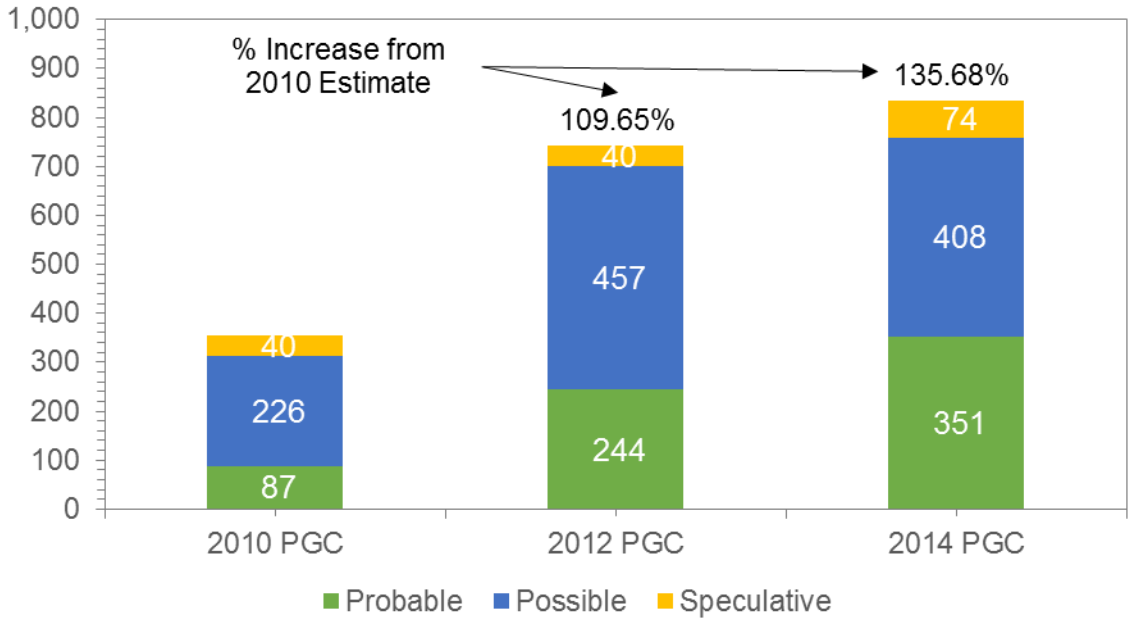
(2) Possible resources are undiscovered resources associated with new field and pool discoveries in known productive formations and productive areas; and

(3) Speculative resources are undiscovered resources associated with new field and pool discoveries in as-yet nonproductive areas.[27]

[26] *See*, Potential Gas Committee, *What We Do*, http://potentialgas.org/what-we-do-2, accessed May 2015.
[27] Ibid.

Figure 6 below illustrates the most recent estimates from the PGC.

Figure 6: Atlantic Region Shale Gas Resources (2010 – 2014)[28]



As illustrated in Figure 6 above, the PGC has increased its estimate of potential resources since 2010 in all three categories. In aggregate, the PGC estimates of total potential resources has increased by more than 135% since 2010.

Q. Please describe the new pricing points that are being created to track the pricing dynamics associated with Marcellus and Utica production, and how the creation of those pricing points support continued production from those regions.

A. Due to the growth in production from the Marcellus and Utica shales, certain natural gas pricing services have unveiled new pricing indices to better capture the price of natural gas

[28] Potential Gas Agency, *Potential Supply of Natural Gas in the United States, Report of the Potential Gas Committee (December 31, 2014)*, April 2015.

in those regions. An example of this is the Tennessee Zone 4 Marcellus index which encompasses transactions along the Tennessee Gas Pipeline's Zone 4 300 Leg between Compressor Station 315 in Tioga County, Pennsylvania and Compressor Station 321 in Susquehanna, Pennsylvania. This new pricing index was split off from the original Tennessee Zone 4 Line 300 in April 2012 to better reflect the increased market activity and production in the Marcellus region.[29]

IX. Conclusions

Q. In your opinion, is the Supply Path PA prudent and reasonable?

A. Yes. As demonstrated by the foregoing analysis, EnergyNorth engaged in a rigorous resource portfolio evaluation that identified an opportunity to lower natural gas supply cost through additional capacity to connect to Appalachian supply basin, which includes the prolific Marcellus and Utica shales. Over the past five years, the Appalachian Supply basin has seen exceptional production growth, resulting in the lowest and perhaps least volatile pricing points in the country. The Supply Path PA will provide access to the Marcellus/Utica price points and will allow EnergyNorth to cost effectively serve its customers. The Supply Path PA will also enable several options that may allow EnergyNorth to further reduce customer cost by accessing natural gas storage facilities and better optimizing its existing natural gas storage contracts. For all of these reasons, the Supply Path PA reflects prudent decision making by EnergyNorth to plan for the long term

[29] http://www.naturalgasintel.com/data/data_products/weekly?region_id=northeast&location_id=NEATENN4MAR?region_id=northeast&location_id=NEATENN4MAR, accessed September 15, 2015.

needs of its customers, and is reasonable since it results in a more reliable and cost effective supply for its customers.

Q. Does this conclude your testimony?

A. Yes, it does.