Liberty Utilities


**STATE OF NEW HAMPSHIRE**
**BEFORE THE**
**PUBLIC UTILITIES COMMISSION**

Docket No. DG 17-048

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
Distribution Service Rate Case

# DIRECT TESTIMONY

**OF**

**ROBERT B. HEVERT**

April 28, 2017

THIS PAGE INTENTIONALLY LEFT BLANK

## TABLE OF CONTENTS


**I. Introduction ..... 1**

**II. Purpose and Overview of Testimony ..... 2**

**III. Summary of Conclusions ..... 5**

**IV. Regulatory Guidelines and Financial Considerations ..... 7**

**V. Proxy Group Selection ..... 8**

**VI. Cost of Equity Estimation ..... 13**

A. Constant Growth DCF Model ..... 15

B. Multi-Stage DCF Model ..... 26

C. CAPM Analysis ..... 36

D. Bond Yield Plus Risk Premium Approach ..... 40

**VII. Business Risks and Other Considerations ..... 43**

A. Small Size Premium ..... 43

B. Proposed Decoupling Mechanism ..... 45

C. Flotation Costs ..... 50

**VIII. Capital Market Environment ..... 53**

**IX. Capital Structure ..... 67**

**X. Cost of Debt ..... 69**

**XI. Conclusions and Recommendation ..... 70**

## ATTACHMENTS

| Attachment | Title |
|---|---|
| Attachment RBH-1: | Resume and Testimony Listing of Robert B. Hevert |
| Attachment RBH-2: | Constant Growth DCF Model |
| Attachment RBH-3: | Retention Growth Estimate |
| Attachment RBH-4: | Multi-Stage DCF Model |
| Attachment RBH-5: | Ex-Ante Market Risk Premium Estimate |
| Attachment RBH-6: | Beta Coefficient |
| Attachment RBH-7: | Capital Asset Pricing Model |
| Attachment RBH-8: | Bond Yield Plus Risk Premium |
| Attachment RBH-9: | DuPont Analysis |
| Attachment RBH-10: | Small Size Analysis |
| Attachment RBH-11: | Summary of Adjustment Clauses |
| Attachment RBH-12: | Flotation Cost Adjustment |
| Attachment RBH-13: | Proxy Group Capital Structure |
| Attachment RBH-14: | Embedded Cost of Debt |

## I. INTRODUCTION

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

A. My name is Robert B. Hevert. I am a Partner of ScottMadden, Inc. ("ScottMadden"). My business address is 1900 West Park Drive, Suite 250, Westborough, Massachusetts 01581.

**Q. On whose behalf are you submitting this testimony?**

A. I am submitting this testimony before the New Hampshire Public Utilities Commission ("Commission") on behalf of Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities ("EnergyNorth" or the "Company").

**Q. Please describe your educational background.**

A. I hold a Bachelor's degree in Business and Economics from the University of Delaware, and an MBA with a concentration in Finance from the University of Massachusetts. I also hold the Chartered Financial Analyst designation.

**Q. Please describe your experience in the energy and utility industries.**

A. I have worked in regulated industries for over twenty-five years, having served as an executive and manager with consulting firms, a financial officer of a publicly-traded natural gas utility (at the time, Bay State Gas Company), and an analyst at a telecommunications utility. In my role as a consultant, I have advised numerous energy and utility clients on a wide range of financial and economic issues, including corporate and asset-based transactions, asset and enterprise valuation, transaction due diligence,

and strategic matters. As an expert witness, I have provided testimony in more than 150 proceedings regarding various financial and regulatory matters before numerous state utility regulatory agencies, the Federal Energy Regulatory Commission, and the Province of Alberta, Canada. A summary of my professional and educational background, including a list of my testimony in prior proceedings, is included in Attachment RBH-1 to my testimony.

## II. PURPOSE AND OVERVIEW OF TESTIMONY

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

A. The purpose of my testimony is to present evidence and provide a recommendation regarding the Company's Cost of Equity (sometimes referred to as the "Return on Equity" or "ROE") and to provide an assessment of the capital structure and cost of debt to be used for ratemaking purposes. My analyses and conclusions are supported by the data presented in Attachment RBH-2 through Attachment RBH-14, which have been prepared by me or under my direction.

**Q. What are your conclusions regarding the appropriate Cost of Equity and capital structure for the Company?**

A. My analyses indicate that the Company's Cost of Equity currently is in the range of 10.00 percent to 10.60 percent. Based on the quantitative and qualitative analyses discussed throughout my testimony, I conclude that an ROE of 10.30 percent is reasonable and appropriate. That ROE, together with the Company's proposed capital structure and cost of debt, produces an overall Rate of Return of 7.37 percent. As to its proposed capital

structure, which includes 50.00 percent common equity and 50.00 percent long-term debt, I conclude that the Company's proposal is consistent with the capital structures that have been in place over several fiscal quarters at comparable operating utility companies. Given the consistency of its proposal with similarly-situated utility companies, I conclude that the Company's proposed capital structure is reasonable and appropriate. Regarding the cost of debt, it is my understanding that Company's current weighted average cost of long-term debt is 4.43 percent, which I believe is reasonable and appropriate.

**Q. Please provide a brief overview of the analyses that leads to your ROE recommendation.**

A. Equity analysts and investors use multiple methods to develop their return requirements for investments. In order to develop my ROE recommendation, I relied on three widely-accepted approaches: The Constant Growth and Multi-Stage forms of the Discounted Cash Flow ("DCF") model, the Capital Asset Pricing Model ("CAPM"), and the Bond Yield Plus Risk Premium approach.

My recommendations and conclusions consider the risks associated with (1) the Company's comparatively small size, (2) the Company's proposed decoupling mechanism, and (3) flotation costs associated with equity issuances. My recommendation also considers the changing capital market environment in which companies such as EnergyNorth must compete for capital. For example, Federal monetary policy has begun to move toward a process of "normalization" with the Federal Open Market Committee increasing the target range for the Federal Funds rate three

times since December 2015, and market data indicates investors are expecting continued increases in interest rates during 2017 and into 2018 and 2019. While I did not make any explicit adjustments to my ROE estimates for those factors, I did take them into consideration in determining the range in which the Company's Cost of Equity likely falls.

**Q. How is the remainder of your testimony organized?**

A. The remainder of my testimony is organized as follows:

- Section III – Provides a summary of my conclusions and recommendations;
- Section IV – Discusses the regulatory guidelines and financial considerations pertinent to the development of the cost of capital;
- Section V – Explains my selection of the proxy group used to develop my analytical results;
- Section VI – Explains my analyses and the analytical bases for my ROE recommendation;
- Section VII – Provides a discussion of specific business risks that have a direct bearing on the Company's Cost of Equity;
- Section VIII – Highlights the current capital market conditions and their effect on the Company's Cost of Equity;
- Section IX – Addresses the reasonableness of the Company's proposed capital structure;

- Section X – Addresses the reasonableness of the Company's proposed Cost of Debt; and
- Section XI – Summarizes my conclusions and recommendations.

## III. SUMMARY OF CONCLUSIONS

**Q. What are the key factors considered in your analyses and upon which you base your recommended ROE?**

A. My analyses and recommendations considered the following:

- The *Hope* and *Bluefield* decisions[1] that established the standards for determining a fair and reasonable allowed return on equity including: consistency of the allowed return with other businesses having similar risk; adequacy of the return to provide access to capital and support credit quality; and that the end result must lead to just and reasonable rates.
- The Company's business risks relative to the proxy group of comparable companies and the implications of those risks in arriving at the appropriate ROE.
- The effect of the current capital market conditions on investors' return requirements.

[1] *Bluefield Waterworks & Improvement Co. v. Public Service Comm'n of West Virginia*, 262 U.S. 679 (1923); *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

**Q. What are the results of your analyses?**

A. The results of my analyses are summarized in Table 1.

**Table 1: Summary of Analytical Result**

| **Discounted Cash Flow** | ***Mean Low*** | ***Mean*** | ***Mean High*** |
|---|---|---|---|
| 30-Day Constant Growth DCF | 6.81% | 8.72% | 11.49% |
| 90-Day Constant Growth DCF | 6.89% | 8.80% | 11.57% |
| 180-Day Constant Growth DCF | 6.95% | 8.87% | 11.64% |
| **Multi-Stage DCF (Gordon Method)** | | | |
| 30-Day Multi-Stage DCF | 8.12% | 8.53% | 9.23% |
| 90-Day Multi-Stage DCF | 8.20% | 8.62% | 9.34% |
| 180-Day Multi-Stage DCF | 8.27% | 8.70% | 9.44% |
| **Multi-Stage DCF (Terminal P/E)** | | | |
| 30-Day Multi-Stage DCF | 7.52% | 8.74% | 10.50% |
| 90-Day Multi-Stage DCF | 7.77% | 8.99% | 10.76% |
| 180-Day Multi-Stage DCF | 7.98% | 9.21% | 10.99% |
| **Supporting Methodologies** | | | |
| **CAPM Results** | | ***Bloomberg Derived Market Risk Premium*** | ***Value Line Derived Market Risk Premium*** |
| *Average Bloomberg Beta Coefficient* | | | |
| Current 30-Year Treasury (3.06%) | | 9.70% | 10.19% |
| Near-Term Projected 30-Year Treasury (3.52%) | | 10.15% | 10.65% |
| *Average Value Line Beta Coefficient* | | | |
| Current 30-Year Treasury (3.06%) | | 10.55% | 11.11% |
| Near-Term Projected 30-Year Treasury (3.52%) | | 11.01% | 11.56% |
| | | | |
| | ***Low*** | ***Mid*** | ***High*** |
| **Bond Yield Risk Premium** | 9.94% | 10.01% | 10.25% |
| | | | |
| Flotation Costs | | 0.11% | |

Based on the analytical results presented in Table 1, and in light of the considerations discussed throughout the balance of my testimony regarding the Company's business and regulatory risks relative to the proxy group, it is my view that an ROE of 10.30 percent is reasonable and appropriate.

## IV. REGULATORY GUIDELINES AND FINANCIAL CONSIDERATIONS

**Q. Please provide a brief summary of the guidelines established by the United States Supreme Court (the "Court") for the purpose of determining a utility's ROE.**

A. The Court established the guiding principles for establishing a fair return for capital in two cases: (1) Bluefield Water Works and Improvement Co. v. Public Service Comm'n of West Virginia ("*Bluefield*"); and (2) Federal Power Comm'n v. Hope Natural Gas Co. ("*Hope*").[2] In those cases, the Court recognized that the fair rate of return on equity should be (1) comparable to returns investors expect to earn on other investments of similar risk, (2) sufficient to assure confidence in the company's financial integrity, and (3) adequate to maintain and support the company's credit and to attract capital.

**Q. Does New Hampshire precedent provide similar guidance?**

A. Yes. In its decision in Order No. 24,972 the Commission indicated that it adheres to the capital attraction standard expressed in the *Hope* and *Bluefield* decisions.[3] That Order also states that the Commission is:

---

[2] *Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923); *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

[3] *EnergyNorth Natural Gas, Inc. d/b/a National Grid NH,* Docket DG 08-009, Order No. 24,972 at 54-55 (May 29, 2009).

> [B]ound to set a rate of return that falls within a zone of reasonableness, neither so low to result in a confiscation of company property, nor so high as to result in extortionate charges to customers. A rate falling within the zone should, at a minimum, be sufficient to yield the cost of debt and equity capital necessary to provide the assets required for the discharge of the company's responsibility.[4]

Based on those standards, the authorized ROE should provide the Company with the opportunity to earn a fair and reasonable return, and should enable efficient access to external capital under a variety of market conditions.

## V. PROXY GROUP SELECTION

**Q. As a preliminary matter, why is it necessary to select a group of proxy companies to determine the Cost of Equity for EnergyNorth?**

A. Since the ROE is a market-based concept, and EnergyNorth is not a publicly traded entity, it is necessary to establish a group of comparable publicly traded companies to serve as its "proxy." Even if EnergyNorth were a publicly traded entity, short-term events could bias its market value during a given period of time. A significant benefit of using a proxy group is that it serves to moderate the effects of anomalous, temporary events associated with any one company.

**Q. Does the selection of a proxy group suggest that analytical results will be tightly clustered around average (*i.e.*, mean) results?**

A. No. The DCF approach, for example, defines the Cost of Equity as the sum of the expected dividend yield and projected long-term growth. Despite the care taken to ensure

[4] *Ibid.*, at 54. *See also, Appeal of Conservation Law Foundation*, 127 N.H. 606, 635 (1986).

risk comparability, market expectations with respect to future risks and growth opportunities will vary from company to company. Therefore, even within a group of similarly situated companies, it is common for analytical results to reflect a seemingly wide range. At issue, then, is how to estimate the Cost of Equity from within that range. That determination necessarily must consider a wide range of both empirical and qualitative information.

**Q. Please provide a summary profile of EnergyNorth.**

A. EnergyNorth provides gas distribution service to approximately 94,000 residential, commercial, and industrial customers in 30 municipalities in New Hampshire.[5]

**Q. How did you select the companies included in your proxy group?**

A. I began with the group of 10 companies that Value Line classifies as Natural Gas Utilities: Atmos Energy, Chesapeake Utilities Corporation, New Jersey Resources, NiSource Inc., Northwest Natural Gas, South Jersey Industries, Southwest Gas, Spire Inc., UGI Corp., and WGL Holdings. I then applied the following screening criteria:

- Because certain of the models used in my analyses assumes that earnings and dividends grow over time, I excluded companies that do not consistently pay quarterly cash dividends;

[5] Annual Report of Liberty Utilities (EnergyNorth Natural Gas) Corp. to the Public Utilities Commission of the State of New Hampshire for the Year Ended December 31, 2016, at 2.

- To ensure that the growth rates used in my analyses are not biased by a single analyst, all of the companies in my proxy group have been covered by at least two utility industry equity analysts;
- All the companies in my proxy group have investment grade senior unsecured bond and/or corporate credit ratings from S&P;
- To incorporate companies that are primarily regulated gas distribution utilities, I have only included companies with at least 60 percent of operating income derived from regulated natural gas utility operations; and
- I eliminated companies that are currently known to be party to a merger, or other significant transaction.

**Q. Based on those criteria, what is the composition of your proxy group?**

A. The criteria discussed above results in a proxy group of the following seven companies provided in Table 2 below.

**Table 2: Proxy Group**

| Company | Ticker |
|---|---|
| Atmos Energy Corporation | ATO |
| Chesapeake Utilities Corporation[6] | CPK |
| New Jersey Resources Corporation | NJR |
| Northwest Natural Gas Company | NWN |
| South Jersey Industries, Inc. | SJI |
| Southwest Gas Corporation | SWX |
| Spire Inc. | SR |

**Q. Do you believe your proxy group appropriately represents EnergyNorth's risk profile?**

A. Yes, I do. In Docket No. DE 16-383, the distribution rate proceeding for EnergyNorth's electric utility affiliate, Liberty Utilities (Granite State Electric) Corp., I began with a universe of 44 electric utilities, many of which had both natural gas and electric utility operations. One important difference in this proceeding is that the universe of potential proxies includes only ten companies, all of which Value Line considers to be primarily natural gas utilities. By applying the screening criteria discussed above, I ensured that the proxy group excludes companies with regulated electric operations, or significant unregulated activities. Consequently, the proxy group contained in Table 2 contains companies that, like EnergyNorth, are focused on the regulated distribution of natural gas. Because all seven proxy companies are primarily natural gas distribution utilities they are reasonable proxies for EnergyNorth.

[6] Even though Chesapeake Utilities Corp is not publicly rated by S&P, its Value Line Financial Strength Rating of B++ is comparable to the rest of the proxy group.

**Q. Do you believe that seven companies constitute a sufficiently large proxy group for the purpose of determining the Cost of Equity for a utility?**

A. Yes, I do. Because all analysts use some form of screening process to develop proxy groups, those groups, by definition, are not randomly drawn from a larger population. Consequently, there is no reason to place more reliance on the range of results derived from a larger, but potentially less comparable proxy group simply by virtue of the larger number of observations. Moreover, because I am using market-based data, my analytical results will not necessarily be tightly clustered around a central point. Results that may be somewhat dispersed, however, do not suggest that the screening approach is inappropriate or the results less meaningful. Including companies whose fundamental comparability to the subject company is tenuous, simply for the purpose of expanding the number of observations, does not add relevant information to the analysis. To that point, in 2004, the Commission recognized that comparability is more important than the size of the proxy group:

> [T]he DCF is an economic theory for which a more comparable sample, rather than a larger sample, produces results that are more likely to be representative of the subject utility. The size of the sample is irrelevant when, as here, the sample is not random.[7]

[7] *Verizon New Hampshire*, Order No. 24,265 at 61 (Jan. 16, 2004).

## VI. COST OF EQUITY ESTIMATION

**Q. Please briefly discuss the ROE in the context of the regulated rate of return.**

A. Regulated utilities primarily use common stock and long-term debt to finance their capital investments. The overall rate of return ("ROR") weighs the costs of the individual sources of capital by their respective book values. Whereas the costs of debt and preferred stock can be directly observed, the Cost of Equity cannot; rather, it must be estimated from market-based information.

**Q. How is the required ROE determined?**

A. The ROE is estimated by applying various financial models to market-based data. By their very nature, those models produce a range of results, from which the market-required ROE must be determined. As discussed throughout my testimony, that determination must be based on a comprehensive review of relevant data and information, and does not necessarily lend itself to a strict mathematical solution. The key consideration in determining the ROE is to ensure that the overall analysis reasonably reflects investors' view of the financial markets in general, and the subject company (in the context of the proxy companies) in particular.

Although several models have been developed for that purpose, all are subject to limiting assumptions or other constraints. Consequently, many finance texts recommend using multiple approaches to estimate the Cost of Equity.[8] When faced with the task of

[8] *See*, for example, Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed., 1994, at 341; and Tom Copeland, Tim Koller and Jack Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd ed., 2000, at 214.

estimating the Cost of Equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed and, therefore, rely on multiple analytical approaches.

Lastly, as a practical matter no individual model is more reliable than all others under all market conditions. Therefore, it is both prudent and appropriate to use multiple methods to mitigate the effects of assumptions and inputs associated with any single approach. As such, I have considered the Constant Growth and Multi-Stage forms of the DCF model, the Capital Asset Pricing Model, and the Bond Yield Plus Risk Premium approach.

**Q. Are you aware that the New Hampshire Commission has relied primarily on the DCF approach in establishing the ROE for regulated utilities?**

A. Yes, I am aware that the Commission has expressed its preference for the DCF approach as the primary method in determining the ROE. However, the Commission also has encouraged the use of other methods as a test of the reasonableness of the DCF results. In prior proceedings, for example, both Staff and the Commission supported the use of a three-stage DCF model. As the Commission noted:

> Staff testimony supports the view that a three-stage version of the DCF represents a valuable refinement to the DCF model of estimating the cost of capital looking forward over the long term. We agree. Given the computing power available to analysts today, it is possible to more closely match growth rate estimates to varying growth expectations over longer time horizons.[9]

[9] *Verizon New Hampshire*, Order No. 24,265 at 65 (Jan. 16, 2004).

As such, I have relied on two forms of the DCF model (the Constant Growth and Multi-Stage forms) along with the CAPM and Risk Premium approaches.

## A. Constant Growth DCF Model

**Q. Are DCF models widely used in regulatory proceedings?**

A. Yes. In my experience, the Constant Growth DCF model is widely recognized in regulatory proceedings, as well as in financial literature. Nonetheless, neither the DCF nor any other model should be applied without considerable judgment in the selection of data and the interpretation of results.

**Q. Please describe the DCF approach.**

A. The DCF approach is based on the theory that a stock's current price represents the present value of all expected future cash flows. In its simplest form, the DCF model expresses the Cost of Equity as the sum of the expected dividend yield and long-term growth rate, and is expressed as follows:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_\infty}{(1+k)^\infty} \quad \text{Equation [1]}$$

where $P$ represents the current stock price, $D_1 \ldots D_\infty$ represent expected future dividends, and $k$ is the discount rate, or required ROE. Equation [1] is a standard present value calculation that can be simplified and rearranged into the familiar form:

$$k = \frac{D_0\,(1+g)}{P} + g \quad \text{Equation [2]}$$

Equation [2] often is referred to as the "Constant Growth DCF" model, in which the first term is the expected dividend yield and the second term is the expected long-term annual growth rate.

In essence, the Constant Growth DCF model assumes that the total return received by investors includes the dividend yield, and the rate of growth. As explained below, under the model's assumptions, the rate of growth equals the rate of capital appreciation. That is, the model assumes that the investor's return is the sum of the dividend yield and the increase in the stock price.

**Q. What assumptions are required for the Constant Growth DCF model?**

A. The Constant Growth DCF model assumes: (1) a constant average annual growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a constant price-to-earnings ("P/E") multiple; and (4) a discount rate greater than the expected growth rate. Under those assumptions, dividends, earnings, book value, and the stock price all grow at the same, constant rate.

**Q. What market data did you use to calculate the dividend yield component of your DCF model?**

A. The dividend yield is based on the proxy companies' current annualized dividend, and average closing stock prices over the 30-, 90-, and 180-trading day periods as of March 31, 2017.

**Q. Why did you use three averaging periods to calculate an average stock price?**

A. I did so to ensure that the model's results are not skewed by anomalous events that may affect stock prices on any given trading day. At the same time, the averaging period should be reasonably representative of expected capital market conditions over the long term. In my view, using 30-, 90-, and 180-day averaging periods reasonably balances those concerns.

**Q. Did you make any adjustments to the dividend yield to account for periodic growth in dividends?**

A. Yes. Because utilities increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is appropriate to calculate the expected dividend yield by applying one-half of the long-term growth rate to the current dividend yield. See Attachment RBH-2. That adjustment ensures that the expected dividend yield is representative of the coming twelve-month period, and does not overstate the dividends to be paid during that time.

**Q. Is it important to select appropriate measures of long-term growth in applying the DCF model?**

A. Yes. In its Constant Growth form, the DCF model (*i.e.*, as presented in Equation [2] above) assumes a single growth estimate in perpetuity. This assumption requires a fixed payout ratio, and the same constant growth rate for earnings per share ("EPS"), dividends per share, and book value per share. Because dividends are sustained by earnings, the

model should incorporate a variety of measures of long-term earnings growth. That can be accomplished by averaging those measures of long-term growth that tend to be least influenced by capital allocation decisions that companies may make in response to near-term changes in the business environment. Because such decisions may directly affect near-term dividend payout ratios, estimates of earnings growth are more indicative of long-term investor expectations than are dividend growth estimates. Therefore, for the purposes of the Constant Growth DCF model, growth in EPS represents the appropriate measure of long-term growth.

**Q. Please summarize your inputs to the Constant Growth DCF model.**

A. I used the following inputs for the price and dividend terms:

1. The average daily closing prices for the 30-, 90-, and 180-trading days ended March 31, 2017, for the term $P_0$; and
2. The annualized dividend per share as of March 31, 2017, for the term $D_0$.

I then calculated my DCF results using each of the following growth terms:

1. The Zack's consensus long-term earnings growth estimates;
2. The First Call consensus long-term earnings growth estimates;
3. The Value Line long-term earnings growth estimates; and
4. An estimate of Retention Growth.

**Q. How did you calculate the high and low DCF results?**

A. I calculated the proxy group mean high DCF results by using the maximum EPS growth rate as reported by Value Line, Zack's, First Call, and the Retention Growth estimate for each proxy group company in combination with the dividend yield for each of the proxy group companies. The proxy group mean high results then reflect the average of the maximum DCF results for the proxy group as a whole. I used a similar approach to calculate the proxy group mean low results using instead the minimum of the Value Line, Zack's, First Call, and Retention Growth estimate for each proxy group company.

**Q. Are you aware that the Commission has indicated that it favors use of growth forecasts aside from expected earnings per share growth?**

A. Yes, I am aware that the Commission has accepted the use of different estimates of growth, including dividends per share, and book value per share. In support of that approach, the Commission observed that stock price appreciation is not the sole determinant of investors' returns, and that dividends represent an important element of the return from utility stocks. The Commission further stated that sole reliance on earnings growth is not appropriate since the Constant Growth DCF model assumes a constant P/E ratio.[10]

[10] *Energy North Natural Gas, Inc. d/b/a National Grid NH,* Order No. 24,972 at 63 (May 29, 2009).

**Q. In light of the Commission's concerns, have you included measures of expected growth aside from earnings growth projections?**

A. Yes, I have included a measure of Retention Growth in my DCF analysis. As discussed in more detail below, the Retention Growth estimate models expected growth as a function of the proportion of earnings that are reinvested back into the firm, the returns earned on invested equity (that is, internally funded growth) and the expected issuance of common stock (externally funded growth).

**Q. Please describe the Retention Growth model.**

A. The Retention Growth model, which is a generally recognized and widely taught method of estimating long-term growth, is an alternative approach to the use of analysts' earnings growth estimates. In essence, the model is premised on the proposition that a firm's growth is a function of its expected earnings, and the extent to which it retains earnings to invest in the enterprise. In its simplest form, the model represents long-term growth as the product of the retention ratio (*i.e.,* the percentage of earnings not paid out as dividends, referred to below as ("b") and the expected return on book equity (referred to below as ("r")). Thus, the simple "b x r" form of the model projects growth as a function of internally generated funds. That form of the model is limiting, however, in that it does not provide for growth funded from external equity.

The "br + sv" form of the Retention Growth estimate used in my DCF analysis is meant to reflect growth from both internally generated funds *(i.e.,* the "br" term) and from issuances of equity *(i.e.,* the "sv" term). The first term, which is the product of the

retention ratio *(i.e.,* "b", or the portion of net income not paid in dividends) and the expected Return on Equity *(i.e.,* "r") represents the portion of net income that is "plowed back" into the Company as a means of funding growth. The "sv" term is represented as:

$$\left(\frac{m}{b} - 1\right) \; x \; Growth\; rate\; in\; Common\; Shares \qquad \text{Equation [3]}$$

where $\frac{m}{b}$ is the Market-to-Book ratio.

In this form, the "sv" term reflects an element of growth as the product of (a) the growth in shares outstanding, and (b) that portion of the market-to-book ratio that exceeds unity. As shown in Attachment RBH-3, all of the components of the Retention Growth Model can be derived from data provided by Value Line.

**Q. Are you aware that Staff has rejected the "Retention Growth" model in prior proceedings?**

A. Yes, I am aware that Staff elected not to use the Retention Growth model in Docket No. DE 13-063. I note, however, that in Docket No. DE 16-383, Staff's witness included a form of the Retention Growth in his testimony. Direct testimony of J. Randall Woolridge, Exhibit 11, at 49-50.

**Q. Do you believe that the "Retention Growth" model is appropriate in this proceeding?**

A. Yes, I do. I recognize that I did not agree with the use of the Retention Growth model in Docket No. DE 13-063. In that proceeding, I noted that the "fundamental elements of the 'r' component of the retention growth model are likely to be unstable over the near term,"

and therefore, "the 'retention growth' model should be viewed with caution."[11] My position in that case, as in this proceeding, is that if the Retention Growth model is used, the determinants of the expected earned Return on Common Equity, including the projected level of sales efficiency, profitability, and capitalization ratios, should remain reasonably constant over the projection period, and that changes from historical levels should be consistent with other observable data.

As noted earlier, the Retention Growth model fundamentally reflects the subject company's expected Return on Common Equity, and the extent to which that return is retained, rather than paid out in dividends. That is, expected growth is positively related to the retention ratio: The greater the rate of earnings retention, the greater the expected growth rate. One method of examining whether that assumption holds is to analyze the historical relationship between retention ratios and subsequent earnings growth rates. Given the relatively small number of proxy companies, I considered the other fundamental variable in the Retention Growth equation (that is, the projected return on common equity, or "r") to determine whether it is likely to remain constant over the forecast period. In particular, I considered the Retention Growth model's assumption that the components of "r" remain reasonably stable over time.

[11] *Granite State Electric Company d/b/a Liberty Utilities,* Docket No. DE 13-063, Direct Testimony of Robert B. Hevert, March 29, 2013, at 21.

To perform that analysis, I used the "DuPont" formula, which decomposes the Return on Common Equity into three components: the Profit Margin (net income/revenues), Asset Turnover (revenues/net plant), and the Equity Multiplier (net plant/equity).

$$ROCE = Net\ Profit\ Margin \times Asset\ Turnover \times Equity\ Multiplier \quad \text{Equation [4]}$$

$$ROCE = \frac{Net\ Profit}{Revenue} \times \frac{Revenue}{Assets} \times \frac{Assets}{Equity} \quad \text{Equation [5]}$$

As demonstrated in Attachment RBH-9, the product of those three measures is approximately equal (but for rounding) to Value Line's reported return on common equity, on both a historical and projected basis. And, as shown in Table 3 (below), the three components of the "r" are expected to remain relatively stable over time. That is, the earnings are not expected to be materially affected by either the method of capitalization (the ratio of assets to equity), or the projected asset efficiency (that is, the revenue produced per dollar of assets), although profit margins do reflect somewhat of an improvement over recent levels.

**Table 3: DuPont Analysis of Proxy Group Return on Common Equity**

| Year | Profit Margin | Asset Turnover | Equity Multiplier | Return on Equity |
|---|---|---|---|---|
| 2012 | 7.41% | 76.65% | 219.12% | 10.66% |
| 2013 | 7.25% | 74.11% | 223.02% | 9.81% |
| 2014 | 7.03% | 76.89% | 225.29% | 10.52% |
| 2015 | 7.47% | 62.97% | 230.01% | 9.82% |
| 2016 | 8.78% | 49.48% | 225.00% | 9.24% |
| 5-Year Projection | 9.38% | 57.31% | 216.04% | 10.66% |

**Q. Why have you not relied on projected dividend growth and book value growth rates in your Constant Growth DCF analysis?**

A. I disagree with the use of dividend and book value growth rates for several reasons. First, as noted earlier, earnings are the fundamental determinant of the ability to pay dividends. Management decisions to conserve cash for capital investments, to manage the dividend payout for the purpose of minimizing future dividend reductions, or to finance future earnings prospects can influence dividend growth rates in the near-term. Because dividends are discretionary, in the short run dividend growth may deviate significantly from earnings growth. Over the long run, however, dividends are dependent on earnings.

Similarly, the book value of equity can increase only through increases to retained earnings, or through the issuance of new equity. Both of those factors are derived from earnings: Retained earnings increase with the amount of earnings not distributed as dividends; and the price at which new equity is issued is a function of the earnings per

share and the then-current P/E ratio. In addition, academic research has clearly indicated that measures of earnings and cash flow are strongly related to returns.

Lastly, whereas Zack's and First Call are consensus growth estimates, Value Line is the sole provider of dividend and book value growth estimates. Putting aside the observations that if investor services such as Zack's and First Call felt that projected dividend and book value growth rates were important to investors they likely would provide them, the fact that Value Line growth rates are developed by a single analyst introduces a potential element of bias. It is for that reason that one of my screening criteria is that comparable companies must be followed by multiple analysts.

**Q. Do you have any other comments regarding the use of dividend or book value growth rates in the Constant Growth DCF model?**

A. Yes. As noted earlier, the Constant Growth DCF model assumes that earnings, dividends, and book value all grow at the same constant rate, and that the P/E ratio remains constant in perpetuity. Under those strict assumptions, the DCF result does not vary if the stock is held in perpetuity, or if it is held for only two, five, or ten years, or any other period and sold at the market price at the end of that period. In practice, however, those assumptions rarely, if ever, hold. Because investors are not likely to hold stock in perpetuity, they expect a substantial portion of the return in the form of capital appreciation. Because stock valuation levels are statistically related to earnings growth (but not dividend or book value growth) earnings growth is the appropriate growth rate to use in the DCF analysis.

**B. Multi-Stage DCF Model**

**Q. What other forms of the DCF model have you considered?**

A. To address certain limiting assumptions underlying the Constant Growth form of the DCF model (such as those noted by the Commission), I also applied the Multi-Stage (three-stage) Discounted Cash Flow Model. The Multi-Stage model, which is an extension of the Constant Growth form and has been applied in regulatory proceedings, enables the analyst to specify growth rates over three distinct stages. As with the Constant Growth form of the DCF model, the Multi-Stage form defines the Cost of Equity as the discount rate that sets the current price equal to the discounted value of future cash flows. Unlike the Constant Growth form, however, the Multi-Stage model must be solved in an iterative fashion.

**Q. Are you aware Staff recommended discarding the Multi-Stage DCF method in Docket No. DE 13-063?**

A. Yes, I am. In Docket No. DE 13-063, Staff argued that Granite State "was a well-established electric distribution company", characterized the company as "in the maturity stage of its life cycle", and therefore argued that the constant growth DCF model was most appropriate method.[12]

[12] See, Docket No. DE 13-063 *Granite State Electric Company d/b/a Liberty Utilities* Rate Case, Testimony of Leszek Stachow, at 15.

Investors' expectations of growth rates, however, may not remain constant over time, even for well-established companies, and the Multi-Stage DCF model allows for changes in expected growth rates.

Looking forward, Regulatory Research Associates notes that electric utility capital expenditures are expected to somewhat decline in 2018 and 2019.[13] The Multi-Stage DCF model provides the flexibility to reflect the prospect of changes in payout ratios in connection with changes in capital investments, and to capture differences in future growth rates owing to current investments.

Lastly, I note that in *Verizon New Hampshire*, Order No. 24,265 (Jan. 16, 2004), both the Commission and Staff noted the beneficial aspects of the Multi-Stage DCF model. Similarly, in Order No. 24,552 the Commission noted that in a prior order (Order No. 24,473) it "reaffirmed the use of the Three Stage DCF model…." *Public Serv. Co. of N.H.*, Order No. 24,552 at 13 (Dec. 2, 2005).

**Q. Is the Multi-Stage form of the DCF method commonly considered in regulatory proceedings?**

A. Yes, it is. In my experience, forms of the Multi-Stage DCF approach have been presented and accepted in regulatory proceedings. For example, the Colorado Public Utilities Commission has found that the Multi-Stage DCF approach is "a rational, model-

[13] *See* SNL Energy, *Financial Focus Special Report, Capital Expenditure Update*, March 21, 2017, at 1.

based approach supported by the evidence."[14] In previous rate cases before the Massachusetts Department of Public Utilities ("Department"), the Multi-Stage DCF method has been presented, and the Department has noted the appropriateness of considering all of the DCF estimates when evaluating the Return on Equity.[15]

**Q. Please summarize why you have included the Multi-Stage DCF model among those used to estimate the Cost of Equity.**

A. First, as noted earlier it is both prudent and appropriate to use multiple methodologies to mitigate the effects of assumptions and inputs associated with any single approach. Second, the Constant Growth DCF model assumes that earnings, dividends, and book value will grow at the same, constant rate in perpetuity, that the payout ratio will remain constant in perpetuity, and that the Price/Earnings ratio will remain constant in perpetuity. The model further assumes that the return required today will be the same return required every year in the future. Those assumptions, however, are not likely to hold. In particular, it is likely that over time, payout ratios will increase from their current levels and, to the extent that long-term interest rates increase over the next few years, it is likely that the Cost of Equity also will increase. In my view, the Multi-Stage DCF model enables analysts to consider those issues, and to address the limiting and likely unrealistic assumptions underlying the Constant Growth form of the model.

[14] Colorado Public Utilities Commission, Proceeding No. 12-AL-1268G, Decision No. R13-1307, at para. 318 and 321.

[15] *See, e.g.*, *Petition of Fitchburg Gas and Electric Light Company (Electric Division) d/b/a Unitil,* D.P.U. 13-90, Order, May 30, 2014, at 219.

**Q. Please describe the structure of your Multi-Stage DCF model.**

A. As noted above, the Multi-Stage DCF model sets the subject company's stock price equal to the present value of future cash flows received over three "stages." In the first two stages, "cash flows" are defined as projected dividends. In the third stage, "cash flows" equal both dividends and the expected price at which the stock will be sold at the end of the period (i.e., the "terminal price"). The terminal price is calculated based on the Gordon model, which defines the price as the expected dividend divided by the difference between the Cost of Equity (i.e., the discount rate) and the long-term expected growth rate. In essence, the terminal price is defined by the present value of the remaining "cash flows" in perpetuity. In each of the three stages, the dividend is the product of the projected earnings per share and the expected dividend payout ratio. A summary description of the model is provided in Table 4 (below).

**Table 4: Multi-Stage DCF Structure**

| | Stage | | | |
|---|---|---|---|---|
| **Component** | **0** | **First** | **Second** | **Terminal** |
| Cash Flow | Initial Stock Price | Expected Dividend | Expected Dividend | Expected Dividend + Terminal Value |
| Inputs | • Stock Price<br>• Earnings Per Share ("EPS")<br>• Dividends Per Share ("DPS") | • Expected EPS<br>• Expected DPS | • Expected EPS<br>• Expected DPS | • Expected EPS<br>• Expected DPS<br>• Terminal Value |
| Assumptions | • 30-, 90-, and 180-day average stock price | • EPS Growth Rate<br>• Payout Ratio | • Growth Rate Change<br>• Payout Ratio Change | • Long-term Growth Rate<br>• Long-term Payout Ratio |

**Q. What are the analytical benefits of your three-stage model?**

A. The principal benefits relate to the flexibility provided by the model's structure. Because the model provides the ability to specify near, intermediate, and long-term growth rates, for example, it avoids the sometimes-limiting assumption that the subject company will grow at the same, constant rate in perpetuity. In addition, by calculating the dividend as the product of earnings and the payout ratio, the model accommodates assumptions regarding the timing and extent of changes in the payout ratio to reflect, for example, increases or decreases in expected capital spending, or transition from current payout levels to long-term expected levels. In that regard, because the model relies on multiple

sources of earnings growth rate assumptions, it is not limited to a single source, such as Value Line, for all inputs, and therefore mitigates the potential bias associated with relying on a single source of growth estimates.[16]

The model also enables the analyst to assess the reasonableness of the inputs and results by reference to certain market-based metrics. For example, the stock price estimate can be divided by the expected earnings per share in the final year to calculate the terminal P/E ratio. Similarly, the terminal P/E ratio can be divided by the terminal growth rate to develop a Price to Earnings Growth ("PEG") ratio. To the extent that the projected P/E or PEG ratios are inconsistent with either historical or expected levels, it may indicate incorrect or inconsistent assumptions within the balance of the model.

**Q. Please summarize your inputs to the Multi-Stage DCF model.**

A. I applied the Multi-Stage model to the proxy group described earlier in my testimony. My assumptions with respect to the various model inputs are described in Table 5 below.

[16] *See*, for example, Harris and Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, 21 (Summer 1992).

**Table 5: Multi-Stage DCF Model Assumptions**

| | Stage | | | |
|---|---|---|---|---|
| **Component** | **Initial** | **First** | **Transition** | **Terminal** |
| Stock Price | 30-, 90-, and 180-day average stock price as of March 31, 2017 | | | |
| Earnings Growth | 2015 actual EPS escalated by Period 1 growth rate | EPS growth as average of (1) Value Line; (2) Zack's; (3) First Call; and (4) Retention Growth rates | Transition to Long-term GDP growth | Long-term GDP growth |
| Payout Ratio | | Value Line company-specific | Transition to long-term industry payout ratio | Long-term industry average |
| Terminal Value | | | | Expected dividend in final year divided by solved Cost of Equity less long-term growth rate |

**Q. How did you calculate the long-term Gross Domestic Product ("GDP") growth rate?**

A. The long-term growth rate of 5.50 percent is based on the real Gross Domestic Product (GDP) growth rate of 3.22 percent from 1929 through 2016,[17] and an inflation rate of 2.21 percent. The GDP growth rate is calculated as the compound growth rate in the

[17] Bureau of Economic Analysis, March 30, 2017, update.

chain-weighted GDP for the period from 1929 through 2016. The rate of inflation of 2.21 percent is an average of two components: (1) the compound annual forward rate starting in ten years (*i.e.*, 2027, which is the beginning of the terminal period) based on the 30-day average spread between yields on long-term nominal Treasury Securities and long-term Treasury Inflation Protected Securities, known as the "TIPS spread" of 2.12 percent;[18] and (2) the projected Blue Chip Financial Forecast of CPI for 2023 – 2027 of 2.30 percent.[19]

In essence, the real GDP growth rate projection is based on the assumption that, absent specific knowledge to the contrary, it is reasonable to assume that over time real GDP growth will revert to its long-term mean. In addition, because estimating the Cost of Equity is a market-based exercise, it is important to reflect, to the extent possible, the sentiments and expectations of investors; those expectations are directly captured in the market-based measure of inflation. Lastly, as a point of reference, the 5.50 percent projected nominal GDP growth rate falls 63 basis points below the long-term average of 6.13 percent.[20]

**Q. What were your specific assumptions with regarding the payout ratio?**

A. As noted in Table 5, the first two periods rely on the first year and long-term projected payout ratios reported by Value Line for each of the proxy group companies.[21] Then by

[18] *See* Board of Governors of the Federal Reserve System, "Table H.15 Selected Interest Rates."
[19] *Blue Chip Financial Forecasts*, December 1, 2016, at 14.
[20] Source: Bureau of Economic Analysis.
[21] As reported in the Value Line Investment Survey as "All Div'ds to Net Prof."

the end of the second period (*i.e.*, the end of year 10), it is assumed that the payout ratio will converge to the long-term industry average of 65.58 percent.[22]

**Q. What was your principal assumption regarding the terminal value?**

A. Although I performed a series of analyses in which the terminal value is calculated based on the assumed long-term nominal GDP growth rate,[23] I also completed a series of analyses in which the terminal value is based on the current P/E ratio.[24] The results of those analyses are shown in Table 6, below.

**Q. How did you reflect the Mean Low Constant Growth DCF results in developing your ROE range and recommendation?**

A. In my view, the mean low results are well below a reasonable estimate of the Company's ROE. For example, of 1,052 natural gas rate cases since 1980, only one included an authorized ROE below 9.00 percent.[25] As noted earlier, the Constant Growth DCF model is subject to certain assumptions, one of which is that the calculated Cost of Equity will remain constant in perpetuity. Given that no case has included an authorized ROE as low as the mean low constant growth DCF results since at least 1980, and knowing that market data suggests the potential for increases in interest rates in the future, I believe

[22] Source: Bloomberg Professional
[23] *See,* Attachment RBH-4, pages 1-9.
[24] Defined as the 30-day average of the proxy group P/E ratio, calculated as an Index. *See,* Attachment RBH-4, pages 11-19.
[25] Source: Regulatory Research Associates. See also Attachment RBH-8.

that it is unreasonable to conclude that the mean low results are meaningful estimates of the Company's forward-looking Cost of Equity.

**Q. If you do not believe the mean low results of your DCF models are reasonable, why have you provided them throughout your testimony?**

A. Although I do not believe they should be given meaningful weight, it is important to provide transparency in the presentation of analyses. As such, I have provided the mean low results, which reflect the converse calculation of the mean high results. To be clear, the mean low DCF results are based entirely on the lowest growth rates. The mean results, for both the Constant Growth and Multi-Stage DCF models, are based on the average growth rate, including the lowest (and highest) estimates. Consequently, my DCF analyses certainly reflect the low projected growth rates.

**Q. What are the results of your DCF analysis?**

A. My Constant Growth and Multi-Stage DCF results are summarized in Table 6, below (*see* also Attachment RBH-2 and Attachment RBH-4).

**Table 6: DCF Results**

| **Constant Growth DCF** | ***Low*** | ***Mean*** | ***High*** |
|---|---|---|---|
| 30-Day Average | 6.81% | 8.72% | 11.49% |
| 90-Day Average | 6.89% | 8.80% | 11.57% |
| 180-Day Average | 6.95% | 8.87% | 11.64% |
| **Multi-Stage DCF (Gordon Method)** | ***Low*** | ***Mean*** | ***High*** |
| 30-Day Average | 8.12% | 8.53% | 9.23% |
| 90-Day Average | 8.20% | 8.62% | 9.34% |
| 180-Day Average | 8.27% | 8.70% | 9.44% |
| **Multi-Stage DCF (Terminal P/E)** | ***Low*** | ***Mean*** | ***High*** |
| 30-Day Average | 7.52% | 8.74% | 10.50% |
| 90-Day Average | 7.77% | 8.99% | 10.76% |
| 180-Day Average | 7.98% | 9.21% | 10.99% |

**Q. Did you undertake any additional analyses to support your ROE recommendation?**

A. Yes. As noted earlier, I also applied the CAPM and Risk Premium analyses.

## C. CAPM Analysis

**Q. Please briefly describe the general form of the CAPM analysis.**

A. The CAPM is a risk premium approach that estimates the Cost of Equity for a given security as a function of a risk-free return plus a risk premium to compensate investors for the non-diversifiable or "systematic" risk of that security. As shown in Equation [6], the CAPM is defined by four components, each of which theoretically must be a forward-looking estimate:

$$k = r_f + \beta(r_m - r_f) \quad \text{Equation [6]}$$

where:

$k$ = the required market ROE for a security;

$\beta$ = the Beta coefficient of that security;

$r_f$ = the risk-free rate of return; and

$r_m$ = the required return on the market as a whole.

In Equation [6], the term ($r_m - r_f$) represents the Market Risk Premium.[26] According to the theory underlying the CAPM, since unsystematic risk can be diversified away by adding securities to their investment portfolio, investors should be concerned only with systematic or non-diversifiable risk. Non-diversifiable risk is measured by the Beta coefficient, which is defined as:

$$\beta_j = \frac{\sigma_j}{\sigma_m} x \rho_{j,m} \quad \text{Equation [7]}$$

Where $\sigma_j$ is the standard deviation of returns for company "j," $\sigma_m$ is the standard deviation of returns for the broad market (as measured, for example, by the S&P 500 Index), and $\rho_{j,m}$ is the correlation of returns in between company j and the broad market. The Beta coefficient therefore represents both relative volatility (i.e., the standard deviation) of returns, and the correlation in returns between the subject company and the overall market.

[26] The Market Risk Premium is defined as the incremental return of the market over the risk-free rate.

Intuitively, higher Beta coefficients indicate that the subject company's returns have been relatively volatile and have moved in tandem with the overall market. Consequently, if a company has a Beta coefficient of 1.00, it is as risky as the market and does not provide any diversification benefit.

**Q. What assumptions regarding the risk-free rate did you include in your CAPM analysis?**

A. Because utility assets represent long-term investments, I used two different estimates of the risk-free rate: (1) the current 30-day average yield on 30-year Treasury bonds (*i.e.*, 3.06 percent); and (2) the near-term projected 30-year Treasury yield (*i.e.*, 3.52 percent).[27]

**Q. Why have you relied upon the 30-year Treasury yield for your CAPM analysis?**

A. In determining the security most relevant to the application of the CAPM, it is important to select the term (or maturity) that best matches the life of the underlying investment. Natural gas utilities typically are long-duration investments and, as such, the 30-year Treasury yield is more suitable for the purpose of calculating the Cost of Equity.

**Q. Please describe your ex-ante approach to estimating the Market Risk Premium.**

A. The *ex-ante* Market Risk Premium reflects the expected market required return, less the current 30-year Treasury yield. To estimate the expected market return, I calculated the average ROE based on the Constant Growth DCF model. To do so, I relied on data from

[27] *See*, Blue Chip Financial Forecasts, Vol. 36, No. 4, April 1, 2017, at 2. Consensus projections of the 30-year Treasury yield for the six quarters ending September 2018.

two sources: (1) Bloomberg, and (2) Value Line. For both sources, I calculated the average expected dividend yield (using the same one-half growth rate assumption described earlier) and combined that amount with the average projected earnings growth rate to arrive at the average DCF result. I then subtracted the current 30-year Treasury yield from that amount to arrive at the market DCF-derived *ex-ante* Market Risk Premium estimate. The results of those two calculations are provided in Attachment RBH-5.

**Q. What Beta coefficients did you use in your CAPM analysis?**

A. My approach includes the average reported Beta coefficient from Bloomberg and Value Line for each of the proxy companies (*see,* Attachment RBH-6). Value Line calculates the Beta coefficient over a five-year period, whereas Bloomberg's calculation is based on two years of data; both services adjust their calculated (or raw) Beta coefficients to reflect the tendency of the Beta coefficient to regress to the market mean of 1.00.

**Q. What are the results of your CAPM analysis?**

A. The results of my CAPM analysis are summarized in Table 7 below (*see* also Attachment RBH-7).

**Table 7: Summary of CAPM Results**

| | ***Bloomberg Derived Market Risk Premium*** | ***Value Line Derived Market Risk Premium*** |
|---|---|---|
| *Average Bloomberg Beta Coefficient* | | |
| Current 30-Year Treasury (3.06%) | 9.70% | 10.19% |
| Near Term Projected 30-Year Treasury (3.52%) | 10.15% | 10.65% |
| *Average Value Line Beta Coefficient* | | |
| Current 30-Year Treasury (3.06%) | 10.55% | 11.11% |
| Near Term Projected 30-Year Treasury (3.52%) | 11.01% | 11.56% |

**D. <u>Bond Yield Plus Risk Premium Approach</u>**

**Q. Please generally describe the Bond Yield Plus Risk Premium approach.**

A. This approach is based on the basic financial principle that because equity investors bear the residual risk associated with ownership, they require a premium over the return they would have earned as a bondholder. That is, because returns to equity holders are riskier than returns to bondholders, equity investors must be compensated for that additional risk. Risk premium approaches therefore estimate the Cost of Equity as the sum of the equity risk premium and the yield on a particular class of bonds. The equity risk premium typically is estimated using a variety of approaches, some of which incorporate *ex-ante*, or forward-looking estimates of the Cost of Equity, and others that consider historical, or *ex-post*, estimates. An alternative approach is to use actual authorized returns for electric utilities to estimate the Equity Risk Premium.

**Q. Please explain how you performed your Bond Yield Plus Risk Premium analysis.**

A. I first defined the Risk Premium as the difference between authorized ROEs and the then-prevailing level of long-term (*i.e.*, 30-year) Treasury yield. I then gathered data from 1,052 gas utility rate proceedings between January 1, 1980, and March 31, 2017. In addition to the authorized ROE, I also calculated the average period between the filing of the case and the date of the final order (the lag period). To reflect the prevailing level of interest rates during the term of the proceedings, I calculated the average 30-year Treasury yield over the average lag period (approximately 188 days).

Because the data covers a number of economic cycles,[28] the analysis also may be used to assess the stability of the Equity Risk Premium, which is not constant; prior research has shown that it is directly related to expected market volatility, and inversely related to the level of interest rates.[29] That finding is particularly relevant given the historically low, but increasing level of current Treasury yields.

**Q. How did you model the relationship between interest rates and the Equity Risk Premium?**

A. The basic method used was regression analysis, in which the observed Equity Risk Premium is the dependent variable, and the average 30-year Treasury yield is the

[28] *See*, National Bureau of Economic Research, *U.S. Business Cycle Expansion and Contractions*.

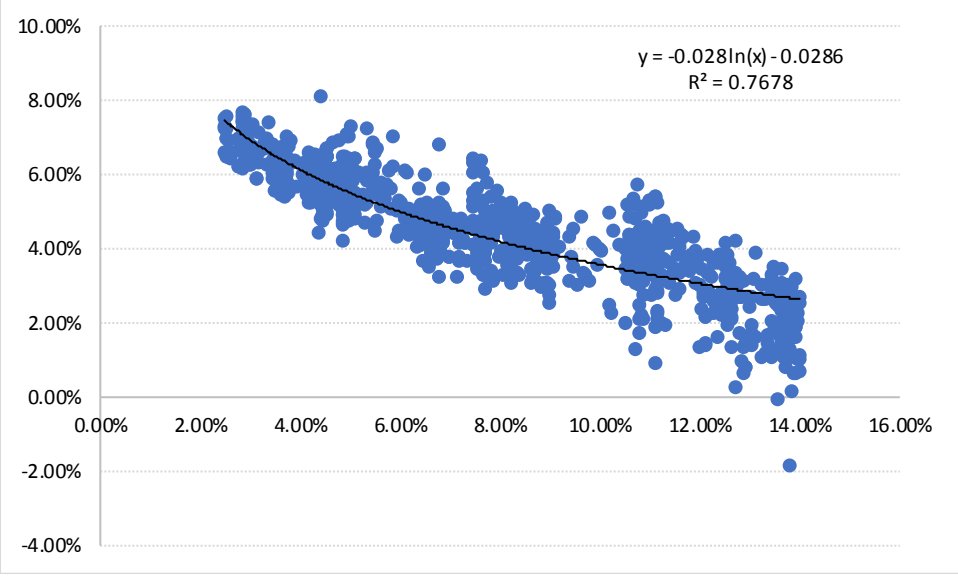
[29] *See*, *e.g.*, Robert S. Harris and Felicia C. Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, Summer 1992, at 63-70; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985, at 33-45; and Farris M. Maddox, Donna T. Pippert, and Rodney N. Sullivan, *An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry*, Financial Management, Autumn 1995, at 89-95.

independent variable. Relative to the long-term historical average, the analytical period includes interest rates and authorized ROEs that are quite high during one period (*i.e.*, the 1980s) and that are quite low during another (*i.e.*, the post-Lehman bankruptcy period). To account for that variability, I used the semi-log regression, in which the Equity Risk Premium is expressed as a function of the natural log of the 30-year Treasury yield:

$$RP = \alpha + \beta(\text{LN}(T_{30})) \quad \text{Equation [8]}$$

As shown on Chart 1 (below), the semi-log form is useful when measuring an absolute change in the dependent variable (in this case, the Risk Premium) relative to a proportional change in the independent variable (the 30-year Treasury yield).

**Chart 1: Equity Risk Premium**




As Chart 1 illustrates, over time there has been a statistically significant, negative relationship between the 30-year Treasury yield and the Equity Risk Premium.

Consequently, simply applying the long-term average Equity Risk Premium of 4.59 percent would significantly understate the Cost of Equity and produce results well below any reasonable estimate. Based on the regression coefficients in Chart 1, however, the implied ROE is between 9.94 percent and 10.25 percent (*see*, Attachment RBH-8).

## VII. BUSINESS RISKS AND OTHER CONSIDERATIONS

**Q. What additional information did you consider in assessing the analytical results noted above?**

A. Because the analytical methods discussed above provide a range of estimates, there are several additional factors that should be taken into consideration when establishing a reasonable range for the Company's Cost of Equity. Those factors include the Company's comparatively small size, the Company's proposed decoupling mechanism, and the costs associated with the flotation of common stock.

### A. Small Size Premium

**Q. Please explain the risk associated with small size.**

A. Both the financial and academic communities have long accepted the proposition that the Cost of Equity for small firms is subject to a "size effect".[30] Although empirical evidence of the size effect often is based on studies of industries beyond regulated utilities, utility

[30] *See*, Mario Levis, *The record on small companies: A review of the evidence*, Journal of Asset Management 2, March 2002, at 368-397, for a review of literature relating to the size effect.

analysts also have noted the risks with associated small market capitalizations. Specifically, Ibbotson Associates noted:

> For small utilities, investors face additional obstacles, such as smaller customer base, limited financial resources, and a lack of diversification across customers, energy sources, and geography. These obstacles imply a higher investor return.[31]

Small size, therefore, leads to two categories of increased risk for investors: (1) liquidity risk (*i.e.*, the risk of not being able to sell one's shares in a timely manner due to the relatively thin market for the securities); and (2) fundamental business risks.

**Q. How does EnergyNorth compare in size to the proxy companies?**

A. EnergyNorth is significantly smaller than the average for the proxy group companies, both in terms of number of customers and market capitalization. Because EnergyNorth is not a separately traded entity, an estimated stand-alone market capitalization for EnergyNorth must be calculated. To do so, I applied the median market to book ratio for the seven-member proxy group to EnergyNorth's implied equity of $125.50 million.[32] The implied market capitalization based on that calculation is $280.38 million, which is 9.30 percent of the median level of the proxy group.

[31] Michael Annin, *Equity and the Small-Stock Effect*, Public Utilities Fortnightly, October 15, 1995.
[32] Stockholder equity was calculated by applying the proposed equity ratio of 50.00 percent to the proposed Rate base for EnergyNorth of approximately $251 million.

**Q. How did you evaluate the risks associated with the Company's relatively small size?**

A. In its *2016 Valuation Handbook*, Duff & Phelps calculates the size premium for deciles of market capitalizations relative to the S&P 500 Index. As shown on Attachment RBH-10, based on recent market data, the average market capitalization of the proxy group is approximately $3.50 billion, and the median market capitalization of the proxy group is $3.00 billion, which correspond to the 4th and 5th deciles, respectively, of Morningstar's market capitalization data. Based on the Morningstar analysis, the proxy group has a size premium of 0.99 percent to 1.49 percent. The implied market capitalization for EnergyNorth is approximately $280.00 million, which falls within the 9th decile and corresponds to a size premium of 2.54 percent, suggesting that a size premium as high as 155 basis points (2.54 percent – 0.99 percent) is expected for EnergyNorth relative to the proxy group. However, rather than propose a specific adjustment, I considered the effect of small size in determining where the Company's ROE falls within the range of results.

## B. Proposed Decoupling Mechanism

**Q. Please briefly describe the Company's proposed decoupling mechanism.**

A. As explained in more detail by Company Witness Gregg H. Therrien, EnergyNorth has proposed a Revenue Decoupling Mechanism ("RDM") consistent with the Commission's approval of the Settlement Agreement in the Energy Efficiency Resource Standard docket, Order No. 25,932 (Aug. 2, 2016). The Company's proposal sets an annual revenue per customer target for the winter and summer seasons, for each RDM Rate Group, based on the distribution revenue level approved by the Commission in this proceeding. At the conclusion of each year, the Company will reconcile actual revenue

per customer to the approved revenue per customer; differences will be credited to or collected from customers through a separate charge. Each subsequent year (that is, following the initial rate year) EnergyNorth will compare its actual distribution revenue per customer to the approved revenue per customer for each season. The "year two" reconciliation also will reflect under or over-recoveries from the prior year's decoupling charge or credit. In aggregate, the "year two" revenue per customer target will equal the approved distribution revenue per customer, plus or minus the prior year's decoupling reconciliation for each season.

**Q. How common are decoupling mechanisms such as the Company's decoupling proposal?**

A. There is little question that decoupling mechanisms have become increasingly common. The increased interest in such mechanisms has generally resulted from the growing cost of maintaining system reliability, coupled with the flat or declining volume brought on by energy efficiency and relatively slow economic growth. An August 2016 report published by Regulatory Research Associates ("RRA") indicated that full or partial revenue decoupling has been implemented by gas utilities in 37 jurisdictions.[33] Consequently, the implementation of such mechanisms has become an increasingly visible issue to investors.

[33] RRA *Adjustment Clauses – A State-By-State Overview*, August 22, 2016. Includes weather normalization clauses.

**Q. Are decoupling mechanisms common among the proxy companies?**

A. Yes, they are. Exhibit RBH-11 provides a summary of decoupling mechanisms currently in effect at each gas utility subsidiary of the proxy group companies. As Exhibit RBH-11 demonstrates, all but one of the proxy group companies has a form of decoupling in place in most, if not all, of its gas utility subsidiaries.

**Q. Would the Company's proposed revenue decoupling structure reduce EnergyNorth's Cost of Equity?**

A. No, it would not. As a preliminary matter, under the proposed RDM, surplus revenue (excluding revenue from expansion rate customers) will be refunded to customers. That is, in proposing the RDM, the Company is forgoing the opportunity to retain revenues that exceed target revenues. That aside, the principal analytical issue in assessing whether the proposed RDM reduces the Company's ROE is whether the Company would be so less risky than its peers as a direct result of the proposed decoupling structure that investors would specifically and measurably reduce their return requirements. The fact that the proposed decoupling structure may stabilize the Company's revenues would not affect its Cost of Equity unless it can be demonstrated that (1) the Company would be materially less risky than the proxy group by virtue of the decoupling mechanism, and (2) investors are likely to react to the incremental effect of the mechanism. Because revenue stabilization and cost recovery mechanisms are common among the proxy companies, there is no reason to assume that EnergyNorth would be materially less risky, and that its Cost of Equity would be lower than its peers' as a result of the proposed decoupling mechanism.

**Q. Have regulatory commissions recognized the prevalence of decoupling mechanisms?**

A. Yes. In its most recent order regarding Baltimore Gas and Electric, for example, the Public Service Commission of Maryland stated that:

> We will not further reduce that return as a result of BGE's decoupling mechanism. No party argued that the Company should have a reduced ROE for its natural gas operations because of decoupling. Instead, as the parties testified, decoupling provisions are common among natural gas distribution companies.[34]

Similarly, in its order regarding Southwest Gas, the Public Utilities Commission of Nevada also noted that decoupling mechanisms have become common:

> The Commission further finds that an adjustment for SWG's revenue decoupling mechanism is unnecessary as all of the companies in the Proxy Group have some form of a rate stabilization mechanism in place.[35]

Given that decoupling mechanisms are viewed as the "norm", it is appropriate to consider the effect that a lack of such mechanisms has on the relative risk of the Company.

The finding that the implementation of revenue stabilization structures does not reduce the Cost of Equity is consistent with the results of two reports by the Brattle Group ("Brattle"). In its first report, Brattle explained that:

> "[i]In the past, the Brattle authors have testified that in these regulated, high fixed cost industries, the determinants of the cost of capital are complicated, [citation omitted] and there should be no presumption that

[34] Baltimore Gas & Electric, Public Service Commission of Maryland, Case No. 9299, Order No. 85374, February 22, 2013, at 78.

[35] Southwest Gas Corporation, Public Utilities Commission of Nevada, Docket No. 12-04005, Modified Final Order, December 14, 2012, at 28

> decoupling automatically lowers the cost of capital. Adoption of decoupling policies could be coincident with other influences that may be increasing non-diversifiable risk. Any reduction in the allowed return on equity should be based upon evidence that decoupling reduces the cost of capital."

The authors concluded that its empirical analyses "do not support the hypothesis that utilities with decoupling have a lower cost of capital than utilities without decoupling."[36]

In an earlier report by the Brattle Group, the authors noted that "The cost of debt may fall with an effective [Automatic Adjustment Clause], while the cost of equity is unlikely to be affected."[37]

**Q. Have you considered the potential effect on the Company's Cost of Equity if the proposed decoupling mechanism is denied?**

A. Yes, I have. If the decoupling mechanism is denied, the Company could be at a disadvantage relative to the proxy group. To be sure, it is difficult to estimate the effect on the Company's ROE if the decoupling mechanism is not implemented. In large part, that difficulty arises from the fact that, whereas there are numerous circumstances in which a decoupling mechanism specifically has been approved, there are few occasions in which a proposed structure was not approved, at least in part. As a consequence, data regarding the financial community's reaction to the denial of a mechanism is quite limited. Nonetheless, utilities across the country have implemented various forms of

[36] *See*, The Brattle Group, *The Impact of Revenue Decoupling on the Cost of Capital for Electric Utilities: An Empirical Investigation*, March 20, 2014, at 3.

[37] Graves, Frank, Hanser, Philip, and Basheda, Greg, *Electric Utility Automatic Adjustment Clauses: Benefits and Design Considerations*, Edison Electric Institute, June 2006 (clarification added).

revenue decoupling mechanisms, fixed monthly charges, rate adjustment mechanisms, and return stabilization structures as means of addressing the financial implications of the continued declining use per customer. In light of their prevalence, gas distribution utilities lacking such structures may be exposed to a comparatively higher level of risk.

**Q. What is your conclusion regarding the effect of the Company's proposed decoupling structure on its Cost of Equity?**

A. As noted above, decoupling mechanisms have become increasingly common for gas utility companies. Consequently, the Company's proposed decoupling structure would not fundamentally alter its risk profile relative to its peers. Further, there is little question that regulatory commissions continue to recognize that revenue stabilization and cost recovery mechanisms are increasingly common and, therefore, already are reflected in current market valuations. On balance, both quantitative and qualitative data suggest that it would inappropriate to reduce the Company's ROE in connection with its proposed decoupling structure.

## C. Flotation Costs

**Q. What are flotation costs?**

A. Flotation costs are the costs associated with the sale of new issues of common stock. These include out-of-pocket expenditures for preparation, filing, underwriting, and other costs of issuance.

**Q. Why is it important to recognize flotation costs in the allowed ROE?**

A. To attract and retain new investors, a regulated utility must have the opportunity to earn a return that is both competitive and compensatory. To the extent that a company is denied the opportunity to recover prudently-incurred flotation costs, actual returns will fall short of expected (or required) returns, thereby diminishing its ability to attract adequate capital on reasonable terms.

**Q. Are flotation costs part of the utility's invested costs or part of the utility's expenses?**

A. Flotation costs are part of capital costs, which are properly reflected on the balance sheet under "paid in capital" rather than current expenses on the income statement. Flotation costs are incurred over time, just as investments in rate base or debt issuance costs. As a result, the great majority of flotation costs is incurred prior to the test year, but remains part of the cost structure during the test year and beyond.

**Q. Do the DCF and CAPM models already incorporate investor expectations of a return in order to compensate for flotation costs?**

A. No. The models used to estimate the appropriate ROE assume no "friction" or transaction costs, as these costs are not reflected in the market price (in the case of the DCF model) or risk premium (in the case of the CAPM and the Bond Yield Plus Risk Premium model). Therefore, it is appropriate to consider flotation costs when determining where within the range of reasonable results EnergyNorth's return should fall.

**Q. Is the need to consider flotation costs recognized by the academic and financial communities?**

A. Yes. The need to reimburse investors for equity issuance costs is recognized by the academic and financial communities in the same spirit that investors are reimbursed for the costs of issuing debt. That treatment is consistent with the philosophy of a fair rate of return. As explained by Dr. Shannon Pratt:

> Flotation costs occur when a company issues new stock. The business usually incurs several kinds of flotation or transaction costs, which reduce the actual proceeds received by the business. Some of these are direct out-of-pocket outlays, such as fees paid to underwriters, legal expenses, and prospectus preparation costs. Because of this reduction in proceeds, the business's required returns must be greater to compensate for the additional costs. Flotation costs can be accounted for either by amortizing the cost, thus reducing the net cash flow to discount, or by incorporating the cost into the cost of equity capital. Since flotation costs typically are not applied to operating cash flow, they must be incorporated into the cost of equity capital.[38]

**Q. How did you calculate the flotation cost recovery adjustment?**

A. I modified the DCF calculation to provide a dividend yield that would reimburse investors for issuance costs. My flotation cost adjustment recognizes the costs of issuing equity that were incurred by the Company and the proxy group companies in their most recent two issuances. As shown in Attachment RBH-12, an adjustment of 0.11 percent (*i.e.*, 11 basis points) reasonably represents flotation costs for the Company

[38] Shannon P. Pratt, Roger J. Grabowski, Cost of Capital: Applications and Examples, 4th ed. (John Wiley & Sons, Inc., 2010), page 586.

**Q. Are you proposing to adjust your recommended ROE by 11 basis points to reflect the effect of flotation costs on EnergyNorth's ROE?**

A. No, I am not. Rather, I have considered the effect of flotation costs, in addition to the Company's other business risks, in determining where the Company's ROE falls within the range of results.

## VIII. CAPITAL MARKET ENVIRONMENT

**Q. Do economic conditions influence the required cost of capital and required return on common equity?**

A. Yes. As discussed in Section VI, the models used to estimate the Cost of Equity are meant to reflect, and therefore are influenced by, current and expected capital market conditions. Therefore, it is important to assess the reasonableness of any financial model's results in the context of observable market data. To the extent that certain ROE estimates are incompatible with such data or inconsistent with basic financial principles, it is appropriate to consider whether alternative estimation techniques are likely to provide more meaningful and reliable results.

**Q. Do you have any general observations regarding the relationship between current capital market conditions and the Company's Cost of Equity?**

A. Yes, I do. Much has been reported about the Federal Reserve's market intervention since 2007, and its effect on interest rates. Although the Federal Reserve completed its Quantitative Easing initiative in October 2014, it was not until December 2015 that it

raised the Federal Funds rate, and began the process of rate normalization.[39] Therefore, a significant issue is how investors will react as that process continues, and eventually is completed. A viable outcome is that investors will perceive greater chances for economic growth, which will increase the growth rates included in the Constant Growth DCF model. At the same time, higher growth and the absence of Federal market intervention could provide the opportunity for interest rates to increase, thereby increasing the dividend yield portion of the DCF model. In that case, both terms of the Constant Growth DCF model would increase, producing increased ROE estimates.

More recently, interest rates have risen and become increasingly volatile. In the equity markets, sectors that historically have included dividend-paying companies have lost value, as increasing interest rates have provided investors with other sources of current yields. Because those dynamics affect different models in different ways, it would be inappropriate to rely on a single method to estimate the Company's Cost of Equity. A more reasoned approach is to understand the relationships among Federal Reserve policies, interest rates, and measures of market risk, and to assess how those factors may affect different models and their results. As discussed throughout my Direct Testimony, the current market is one in which it is very important to consider a broad range of data and models when determining the Cost of Equity.

[39] Federal Reserve Press Release dated December 16, 2015.

**Q. Please summarize the effect of recent Federal Reserve policies on interest rates and the cost of capital.**

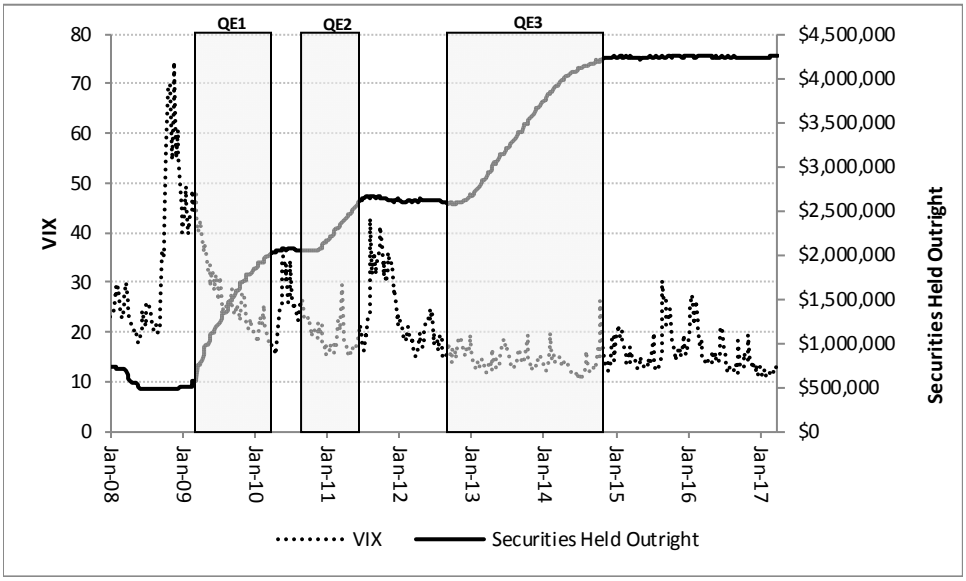
A. Beginning in 2008, the Federal Reserve proceeded on a steady path of initiatives intended to lower long-term Treasury yields.[40] The Federal Reserve policy actions "were designed to put downward pressure on longer-term interest rates by having the Federal Reserve take onto its balance sheet some of the duration and prepayment risks that would otherwise have been borne by private investors."[41] Under that policy, "Securities Held Outright" on the Federal Reserve's balance sheet increased from approximately $489 billion at the beginning of October 2008 to approximately $4.25 trillion by the end of March 2017.[42] To put that increase in context, the securities held by the Federal Reserve represented approximately 3.29 percent of GDP at the end of September 2008, and had risen to approximately 22.53 percent of GDP in March 2017.[43] As such, the Federal Reserve policy actions have represented a significant source of liquidity, and have had a substantial effect on capital markets.

Just as market intervention by the Federal Reserve has reduced interest rates, it also had the effect of reducing market volatility. As shown in Chart 2 (below), each time the Federal Reserve began to purchase bonds (as evidenced by the increase in "Securities Held Outright" on its balance sheet), volatility subsequently declined. In fact, in September 2012, when the Federal Reserve began to purchase long-term securities at a

40 See Federal Reserve Press Release (June 19, 2013).
41 Federal Reserve Bank of New York, Domestic Open Market Operations During 2012, p. 29 (Apr. 2013).
42 Source: Federal Reserve Board Schedule H.4.1. "Securities held outright" include U.S. Treasury securities, Federal agency debt securities, and mortgage-backed securities.
43 Source: Federal Reserve Board Schedule H.4.1; Bureau of Economic Analysis.

pace of $85 billion per month, volatility (as measured by the CBOE Volatility Index, known as the "VIX") fell, and through October 2014 remained in a relatively narrow range. The reason is quite straight-forward: Investors became confident that the Federal Reserve would intervene if markets were to become unstable.

**Chart 2: VIX and Federal Reserve Asset Purchases[44]**




The important analytical issue is whether we can infer that risk aversion among investors is at a historically low level, implying a Cost of Equity that is well below recently authorized returns. Given the negative correlation between the expansion of the Federal Reserve's balance sheet and the VIX, it is difficult to conclude that fundamental risk aversion and investor return requirements have fallen. If it were the case that investors believe that volatility will remain at low levels (that is, that market risk and uncertainty

[15] Source: Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis; Federal Reserve Statistical Release H.4.1, Factors Affecting Reserve Balances.

will remain low), it is not clear why they would decrease their return requirements for defensive sectors such as utilities. In that respect, it appears that the Constant Growth DCF results are at odds with market conditions.

**Q. Does your recommendation also consider the interest rate environment?**

A. Yes, it does. From an analytical perspective, it is important that the inputs and assumptions used to arrive at an ROE recommendation, including assessments of capital market conditions, are consistent with the recommendation itself. Although I appreciate that all analyses require an element of judgment, the application of that judgment must be made in the context of the quantitative and qualitative information available to the analyst and the capital market environment in which the analyses were undertaken.

The low interest rate environment associated with central bank intervention may lead some analysts to conclude that current capital costs, including the Cost of Equity, are low and will remain as such. However, that conclusion only holds true under the hypothesis of Perfectly Competitive Capital Markets ("PCCM") and the classical valuation framework which, under normal economic and capital market conditions, underpin the traditional Cost of Equity models. PCCMs are those in which no single trader, or "market-mover", would have the power to change the prices of goods or services,

including bond and common stock securities.[45] In other words, under the PCCM hypothesis, no single trader would have a significant effect on market prices.

Classic valuation theory assumes that investors trade securities rationally, with prices reflecting their perceptions of value.[46] Although central banks have the ability to set benchmark interest rates, they have been maintaining below normal rates to stimulate continued economic and capital market recovery. It therefore is reasonable to conclude that the Federal Reserve and other central banks have been acting as market-movers, thereby having a significant effect on the market prices of both bonds and stocks. The presence of market-movers, such as the Federal Reserve, runs counter to the PCCM hypothesis, which underlies traditional Cost of Equity models. Consequently, the results of those models should be considered in the context of both quantitative and qualitative information.

Although the Federal Reserve's market intervention policies have kept interest rates historically low, since July 8, 2016, (when the 30-year Treasury yield hit an all-time low of 2.11 percent) rates have risen. As the Federal Reserve increased the Federal Funds target rate by 25 basis points in December 2016 (from 0.25 percent – 0.50 percent to 0.50 percent – 0.75 percent) and again in March 2017 (to 0.75 percent – 1.00 percent), short-term interest rates increased by a corresponding amount.[47] Long-term yields increased by

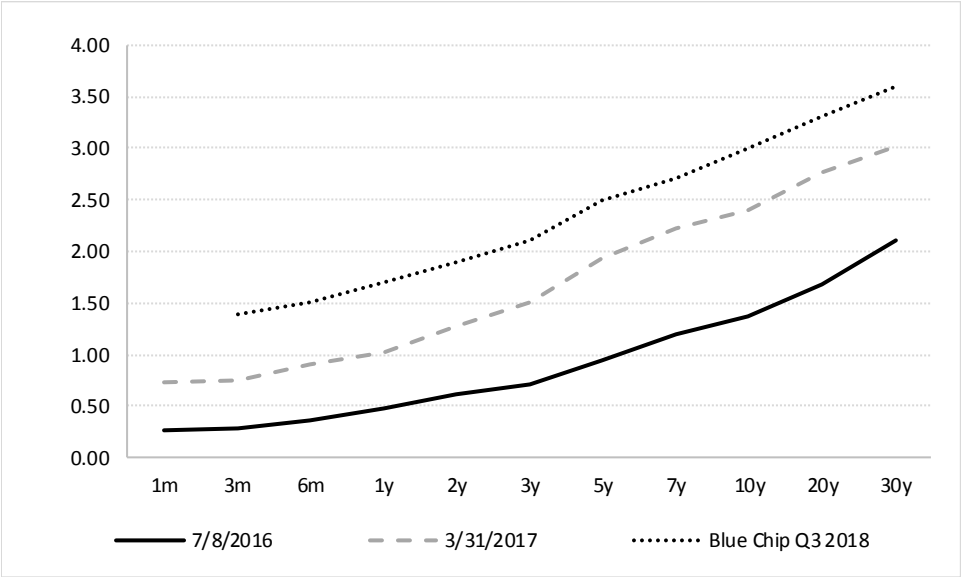
[45] See Myron J. Gordon, The Cost of Capital to a Public Utility, 1974, at 15. See also http://www.nasdaq.com/investing/glossary/p/perfectly-competitive-finanacial-markets.

[46] I.e., the traditional efficient markets formulation. See Stowe et al., Equity Asset Valuation, 2007, at 18.

[47] Federal Reserve Board Schedule H.15. 6-month and 1-year Treasury yields increased by 55 points from July 8, 2016, to March 31, 2017.

wider margins, with the 10-year and 30-year Treasury yields increasing by 103 basis points and 91 basis points, respectively, by March 31, 2017 (*see* Chart 3 below).

**Chart 3: Treasury Yield Curve: 7/8/2016, 3/31/2017 and Projected Q1 2018[48]**




The increase in the ten and 30-year yields from July 2016 to March 2017 is among the highest increase in at least 25 years.[49] That increase in Treasury yields is highly related to increasing inflation. To that point, leading up to and following the November 2016 Presidential election, expected inflation, as measured by the difference between nominal Treasury yields and Treasury Inflation Protected Securities (that difference often is referred to as the "TIPS spread") also increased, such that it stands somewhat above the Federal Reserve's 2.00 percent inflation target (*see* Chart 4, below).

[48] Sources: Federal Reserve Board Schedule H.15.; Blue Chip Financial Forecasts, Vol. 36, No. 4, April 1, 2017, at 2. 3-year, 7-year and 20-year projected Treasury yields interpolated.

[49] Source: Federal Reserve Schedule H.15. The increases fall in the top 100th percentile for the 10-year Treasury yield and the 99th percentile for the 30-year Treasury yield.

**Chart 4: Forward Inflation Estimates 7/8/2016 – 3/31/2017[50]**


The increase in both long-term interest rates and inflation, particularly considering the magnitude of the changes over an abbreviated period, suggest higher investor return requirements.

**Q. Does market-based data indicate that investors see a probability of increasing interest rates?**

A. Yes. Forward Treasury yields implied by the slope of the yield curve and published projections by sources such as *Blue Chip Financial Forecasts* (which provides consensus estimates from approximately 50 professional economists) indicate investors expect long-term interest rates to increase. Similarly, investors' expectations for increased long-term Treasury yields are apparent in the prices investors are willing to pay today for the option

[50] Source: Federal Reserve Schedule H.15. Forward inflation estimates calculated as the difference between implied nominal and inflation protected 20-year Treasury yields in 10 years.

to buy or sell long-term Government bonds, at today's price, in the future. Because the value of bonds falls as interest rates increase, the option to sell bonds at today's price becomes more valuable when interest rates are expected to increase.[51] Currently option prices show that investors are willing to pay about 50.00 percent more for the option to sell bonds in the future (at today's price) than they are willing to pay for the option to buy those bonds.[52] That market-based data tells us that investors consider an increase in interest rates as likely.

Looking to short-term interest rates, data compiled by CME Groups indicates that investors see a high likelihood of further Federal Funds rate increases, even after the December 14, 2016, and March 15, 2017, increases. As shown in Table 8, (below) the market is now anticipating at least one additional rate hike (91.70 percent probability) and possibly two or more (59.20 percent and 21.20 percent probability, respectively) by January 2018. In fact, the implied probability of no increase in the coming year is only 8.40 percent, whereas the likelihood of at least a 50-basis point increase is approximately 60.00 percent. Importantly, the potential for rising rates represents risk for utility investors.

[51] In other words, if there is a high probability that interest rates will increase and bond prices will fall, there is value in the option to sell those bonds in the future at today's price. Conversely, if there is a strong probability that interest rates will decrease (price of bonds will increase), there is value in the option to buy those bonds in the future at today's price.

[52] The option to sell the TLT index in January 2018 at today's price is approximately one and a half times the value of the option to buy the fund. Source: http://www.nasdaq.com/symbol/tlt/option-chain?dateindex=7.

**Table 8: Probability of Federal Funds Rate Increases[53]**

| Target Rate (bps) | Federal Reserve Meeting Date | | | | | | |
|---|---|---|---|---|---|---|---|
| | 5/3/17 | 6/14/17 | 7/26/17 | 9/20/17 | 11/1/17 | 12/13/17 | 1/31/18 |
| 75-100 | 95.7% | 29.5% | 25.8% | 14.5% | 14.0% | 8.9% | 8.4% |
| 100-125 | 4.3% | 67.6% | 62.9% | 46.7% | 45.4% | 34.0% | 33.3% |
| 125-150 | | 3.0% | 11.0% | 33.6% | 34.1% | 38.2% | 37.7% |
| 150-175 | | | 0.4% | 5.0% | 6.1% | 16.3% | 16.7% |
| 175-200 | | | | 0.2% | 0.4% | 2.4% | 2.7% |
| 200-225 | | | | | 0.0% | 0.1% | 0.2% |
| 225-250 | | | | | | 0.0% | 0.0% |

Lastly, we can view the market's expectations of future interest rates based on the current yield curve. Those expected rates, often referred to as "forward yields", are derived from the "Expectations" theory, which states that (for example) the current 30-year Treasury yield equals the combination of the current one-year Treasury yield and the 29-year Treasury yield expected in one year. That is, an investor would be indifferent to (1) holding a 30-year Treasury to maturity, or (2) holding a one-year Treasury to maturity, then a 29-year Treasury bond, also to maturity.[54] As Chart 5 (below) indicates, since 2006 the implied forward 29- and 28- year yields (one and two years hence, respectively)

[53] Source: http://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html, accessed 4/6/2017.

[54] In addition to the Expectations theory, there are other theories regarding the term structure of interest rates including: the Liquidity Premium Theory, which asserts that investors require a premium for holding long term bonds; the Market Segmentation Theory, which states that securities of different terms are not substitutable and, as such, the supply of and demand for short-term and long-term instruments is developed independently; and the Preferred Habitat Theory, which states that in addition to interest rate expectations, certain investors have distinct investment horizons and will require a return premium for bonds with maturities outside of that preference.

consistently exceeded the (interpolated) spot yields. That is, just as economists' projections implied increased interest rates, so did observable Treasury yields.

**Chart 5: Forward vs. Interpolated Treasury Yields[55]**

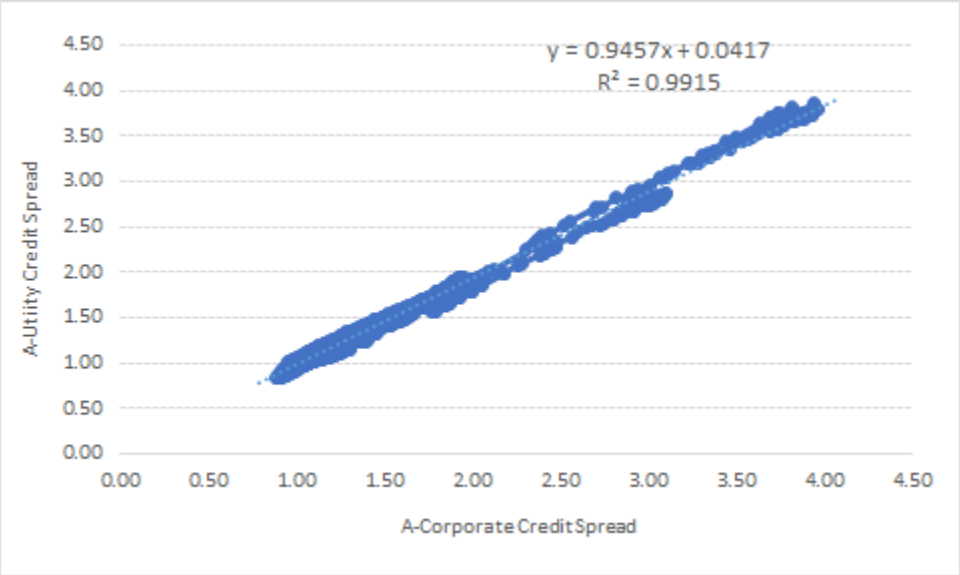

**Q. Have you also reviewed the relationship between credit spreads for A-rated utility debt relative to A-rated corporate debt?**

A. Yes, I have. Given the historical volatility in the spread between corporate and utility A-rated debt, there is no reason to conclude that utility yields are different than those of their corporate counterparts. That conclusion is consistent with the finding that over time, there has been a nearly one-to-one relationship between credit spreads on A-rated corporate and utility bonds. In fact, a regression analysis in which corporate credit spreads are the explanatory variable and utility credit spreads are the dependent variable

[55] Source: Federal Reserve Schedule H.15. Spot yields are interpolated.

shows that slope is approximately 1.00 and highly significant (*see* Chart 6, below). Because the intercept term is statistically insignificant, we can conclude that there has been no material difference between the two, and there certainly is no meaningful difference in the current market.

**Chart 6: Corporate and Utility Credit Spreads (A-Rated)[56]**




**Q. What do you conclude from those analyses?**

A. First, it is clear that interest rates have increased from the low levels experienced in early 2016. Second, it is clear that market-based data indicate investors' expectations of rising interest rates in the near- and longer-term. The observation that interest rates have increased, in combination with the optimism in the market, indicates that the financial community sees the strong prospect of increased growth throughout the economy. As

[56] Source: Federal Reserve Schedule H.15.

that occurs, and as interest rates continue to rise, it would be reasonable to expect lower utility valuations, higher dividend yields, and higher growth rates. In the context of the Discounted Cash Flow model, those variables would combine to indicate increases in the Cost of Equity.

Although the market data discussed above indicate increasing costs of capital, it is important to keep in mind that estimating the Cost of Equity is an empirical exercise, but rote application of a specific form of an analysis, or the mechanical use of specific model inputs, may well produce misleading results. The methods used to estimate the Cost of Equity, or the weight given to any one method, may change from case to case; and that the returns authorized in other jurisdictions provide a relevant, observable, and verifiable benchmark for assessing the reasonableness of analytical assumptions, results, and conclusions.

**Q. Have there been recent periods when utility valuation levels were high relative to both their long-term average and the market?**

A. Yes. For example, between July and December 2016, the SNL Gas Utility Index lost approximately 9.00 percent of its value. At the same time, the S&P 500 increased approximately by 7.00 percent, indicating that the utility sector under-performed the market by about 16.00 percent. Also during that time, the 30-year Treasury yield increased by approximately 95 basis points (an increase of nearly 45.00 percent). The point simply is that as interest rates increased, utility valuations fell. Because (as noted

above) investors see the strong likelihood of further interest rate increases, there is a continuing risk of losses in the utility sector.

**Q. What conclusions do you draw from your analyses of the current capital market environment, and how do those conclusions affect your ROE recommendation?**

A. In my view, we cannot conclude that the recent levels of utility valuations are due to a fundamental change in the risk perceptions of utility investors. There is no measurable difference between credit spreads of A-rated utility debt and A-rated corporate debt. That is, based on analyses of credit spreads, there is no reason to conclude that investors see utilities as less risky relative to either historical levels or to their corporate counterparts.

From an analytical perspective, it is important that the inputs and assumptions used to arrive at an ROE determination, including assessments of capital market conditions, are consistent with the conclusion itself. Although all analyses require an element of judgment, the application of that judgment must be made in the context of the quantitative and qualitative information available to the analyst and the capital market environment in which the analyses were undertaken. Because the application of financial models and interpretation of their results often is the subject of differences among analysts in regulatory proceedings, I believe that it is important to review and consider a variety of data points; doing so enables us to put in context both quantitative analyses and the associated recommendations.

Because not all models used to estimate the Cost of Equity adequately reflect those changing market dynamics, it is important to give appropriate weight to the methods and

to their results. Moreover, because those models produce a range of results, it is important to consider the type of data discussed above in determining where the Companies' ROE falls within that range. On balance, I believe that the DCF-based results should be viewed very carefully, and that somewhat more weight should be afforded the Risk Premium-based methods. I believe that doing so supports my recommended range of 10.00 percent to 10.60 percent, and my ROE recommendation of 10.30 percent.

## IX. CAPITAL STRUCTURE

**Q. What is the Company's proposed capital structure?**

A. The Company has proposed a capital structure comprised of 50.00 percent common equity and 50.00 percent long-term debt.

**Q. Is there a generally accepted approach to developing the appropriate capital structure for a regulated gas utility?**

A. Yes, there are a number of generally accepted approaches to developing the appropriate capital structure. The reasonableness of the approach depends on the nature and circumstances of the subject company. In cases where the subject company does not issue its own securities, it may be reasonable to look to the parent's capital structure or to develop a "hypothetical" capital structure based on the proxy group companies or other industry data. Regardless of the approach taken, however, it is important to consider the resulting capital structure in light of industry norms and investor requirements. That is, the capital structure should enable the subject company to maintain its financial integrity,

thereby enabling access to capital at competitive rates under a variety of economic and financial market conditions.

**Q. How does the capital structure affect the Cost of Equity?**

A. The capital structure relates to a company's financial risk, which represents the risk that a company may not have adequate cash flows to meet its financial obligations, and is a function of the percentage of debt (or financial leverage) in its capital structure. In that regard, as the percentage of debt in the capital structure increases, so do the fixed obligations for the repayment of that debt. Consequently, as the degree of financial leverage increases, the risk of financial distress (*i.e.*, financial risk) also increases. Since the capital structure can affect the subject company's overall level of risk,[57] it is an important consideration in establishing a just and reasonable rate of return.

**Q. Please discuss your analysis of the capital structures of the proxy group companies.**

A. I calculated the average capital structure for each of the proxy group companies over the last eight quarters. As shown in Attachment RBH-13, the mean of the proxy group actual capital structures is 55.58 percent common equity and 44.42 percent long-term debt. The common equity ratios range from 46.94 percent to 70.13 percent. Based on that review, it is apparent that the Company's proposed capital structure is generally consistent with the capital structures of the proxy group companies.

[57] *See*, Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 45-46.

**Q. What is the basis for using average capital components rather than a point-in-time measurement?**

A. Measuring the capital components at a particular point in time can skew the capital structure by the specific circumstances of a particular period. Therefore, it is more appropriate to normalize the relative relationship between the capital components over a period of time.

**Q. What is your conclusion regarding an appropriate capital structure for EnergyNorth?**

A. Considering the average actual equity ratio of 55.58 percent for the proxy group companies, I believe that EnergyNorth's proposed common equity ratio of 50.00 percent is appropriate as it is consistent with the proxy group companies.

## X. COST OF DEBT

**Q. What cost of debt has the company requested in this proceeding?**

A. The Company has proposed a cost of debt of 4.43 percent, which is the Company's actual weighted average cost of debt, as shown in Table 9.

**Table 9: Weighted Cost of Debt**

| *Face Amount* | *Term* | *Rate* | *Weighted Average* |
|---|---|---|---|
| $18,181,818.18 | 5.00 | 3.51% | 0.71% |
| $41,818,181.82 | 10.00 | 4.49% | 2.09% |
| $21,818,181.82 | 15.00 | 4.89% | 1.19% |
| $8,181,818.18 | 15.00 | 4.89% | 0.44% |
| **Total: $90,000,000.00** | | | **4.43%** |

**Q. Please discuss your analysis of the Company's cost of debt.**

A. I calculated the embedded cost of debt for all authorized gas utility returns over the January 1, 2016, to March 31, 2017, period (See Attachment RBH-14). The mean of the embedded cost of debt authorized is 4.53 percent and the median is 4.62 percent. The embedded cost of debt authorized range from 2.28 percent to 7.00 percent. Therefore, I believe the Company's proposed cost of debt of 4.43 percent is reasonable and appropriate.

## XI. CONCLUSIONS AND RECOMMENDATION

**Q. What is your conclusion regarding the Company's Cost of Equity?**

A. I believe that a rate of return on common equity in the range of 10.00 percent to 10.60 percent represents the range of equity investors' required rate of return for investment in gas utilities similar to EnergyNorth in today's capital markets. Within that range, it is my view that an ROE of 10.30 percent is reasonable and appropriate. A summary of the results of my analyses is shown in Table 10 below.

**Table 10: Summary of Analytical Results**

| **Discounted Cash Flow** | ***Mean Low*** | ***Mean*** | ***Mean High*** |
|---|---|---|---|
| 30-Day Constant Growth DCF | 6.81% | 8.72% | 11.49% |
| 90-Day Constant Growth DCF | 6.89% | 8.80% | 11.57% |
| 180-Day Constant Growth DCF | 6.95% | 8.87% | 11.64% |
| **Multi-Stage DCF (Gordon Method)** | | | |
| 30-Day Multi-Stage DCF | 8.12% | 8.53% | 9.23% |
| 90-Day Multi-Stage DCF | 8.20% | 8.62% | 9.34% |
| 180-Day Multi-Stage DCF | 8.27% | 8.70% | 9.44% |
| **Multi-Stage DCF (Terminal P/E)** | | | |
| 30-Day Multi-Stage DCF | 7.52% | 8.74% | 10.50% |
| 90-Day Multi-Stage DCF | 7.77% | 8.99% | 10.76% |
| 180-Day Multi-Stage DCF | 7.98% | 9.21% | 10.99% |
| **Supporting Methodologies** | | | |
| **CAPM Results** | | ***Bloomberg Derived Market Risk Premium*** | ***Value Line Derived Market Risk Premium*** |
| *Average Bloomberg Beta Coefficient* | | | |
| Current 30-Year Treasury (3.06%) | | 9.70% | 10.19% |
| Near-Term Projected 30-Year Treasury (3.52%) | | 10.15% | 10.65% |
| *Average Value Line Beta Coefficient* | | | |
| Current 30-Year Treasury (3.06%) | | 10.55% | 11.11% |
| Near-Term Projected 30-Year Treasury (3.52%) | | 11.01% | 11.56% |
| | | | |
| | ***Low*** | ***Mid*** | ***High*** |
| **Bond Yield Risk Premium** | 9.94% | 10.01% | 10.25% |
| | | | |
| Flotation Costs | | 0.11% | |

Based on the proposed capital structure of 50.00 percent long-term debt and 50.00 percent equity, the Company's proposed cost of debt of 4.43 percent, and my

recommended 10.30 percent Return on Equity, the Company's proposed overall Rate of Return is 7.37 percent (*see* Table 11, below).

**Table 11: Proposed Overall Rate of Return**

| Component | Percent of Total | Cost Rate | Weighted Cost Rate |
|---|---|---|---|
| Common Equity | 50.00% | 10.30% | 5.15% |
| Long-term Debt | 50.00% | 4.43% | 2.22% |
| Total | 100.00% | | 7.37% |

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

A. Yes, it does.