STATE OF NEW HAMPSHIRE

BEFORE THE

NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

DOCKET NO. DE 24-070

REQUEST FOR CHANGE IN RATES

DIRECT TESTIMONY OF

Vincent V. Rea

Cost of Capital

On behalf of Public Service Company of New Hampshire

d/b/a Eversource Energy

June 11, 2024

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Acronyms and Defined Terms

Acronym	Defined Term
β	Beta
CAPM	Capital Asset Pricing Model
DCF	Discounted Cash Flow Model
EBITDA	Earnings before interest, taxes, depreciation and amortization
FED	Federal Reserve Board
FFO	Funds from Operations
FOMC	Federal Open Market Committee
g	Growth rate (perpetual)
GDP	Gross Domestic Product
M&M	Modigliani and Miller
PSNH	Public Service Company of New Hampshire
Rm	Expected return for the overall stock market
ROE	Return on equity
RPM	Risk Premium Model
S&P	Standard & Poor's
SURFA	Society of Utility and Regulatory Financial Analysts
WACC	Weighted average cost of capital

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Vincent V. Rea. My business address is 80 Blake Boulevard, #4572, Pinehurst, North Carolina 28374.

Q. By whom are you employed and in what capacity?

A. I currently serve as Managing Director of Regulatory Finance Associates, LLC, an independent financial and regulatory consulting firm serving the utility industry.

Q. Please describe your professional experience.

A. Prior to moving into my current position, I served as Director, Regulatory Finance and Economics for NiSource Corporate Services Company, a subsidiary of NiSource Inc. ("NiSource"). In this position, I provided expert testimony and other regulatory support on behalf of NiSource's utility subsidiaries with regard to the cost of equity, overall fair rate of return, and ratemaking capital structure. Prior to serving as Director, Regulatory

Finance and Economics, I served as Assistant Treasurer of NiSource. In the capacity as Assistant Treasurer, I was responsible for the external capital raising and banking activities for NiSource, for inter-company financing activities among all NiSource subsidiaries, and also provided regulatory support and testimony for utility rate proceedings and financing petitions. My educational background, professional experience and other qualifications are presented in greater detail in Attachment ES-VVR-1.

Q. Please describe your educational background.

A. I hold a M.B.A. in Finance from Indiana University, Bloomington, Indiana, and a B.A. with honors distinction in Business Administration from Lake Forest College, Lake Forest, Illinois.

Q. Do you hold any professional designations?

A. Yes. I have been awarded the designation of Certified Rate of Return Analyst by the Society of Utility and Regulatory Financial Analysts, and I am also a registered Certified Public Accountant in the State of Illinois.

Q. Have you previously testified before the New Hampshire Public Utilities Commission ("Commission") or any other regulatory commission?

A. Yes. In Docket No. DG-03-080, I filed direct testimony before the Commission on behalf of Northern Utilities, Inc. relating to the company's petition for authority to engage in a long-term intercompany financing transaction between the company and its affiliate, NiSource Finance Corp. I have also testified before other state regulatory commissions in

numerous utility rate proceedings concerning the cost of equity, overall fair rate of return, and regulatory capital structure, as further outlined in Attachment ES-VVR-1.

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

A. The purpose of my direct testimony is to present supporting evidence, analysis and a recommendation concerning the appropriate rate of return on common equity and overall fair rate of return that the Commission should establish for Public Service Company of New Hampshire's ("PSNH" or the "Company") jurisdictional electric operations in relation to its revenue requirement calculation. My recommendations are supported by the detailed financial information and comprehensive analyses presented within my testimony.

Q. Are you sponsoring any attachments to your testimony in this proceeding?

A. Yes. I am sponsoring the following attachments to my direct testimony as reflected in Table 1 below.

Table 1
Attachments Supporting Direct Testimony

Attachment	Description
Attachment ES-VVR-1	Professional Qualifications of Vincent V. Rea
Attachment ES-VVR-2	Comparative Risk Assessment
Attachment ES-VVR-3	Analysis of Regulatory Mechanisms
Attachment ES-VVR-4	DCF Method - Electric Group
Attachment ES-VVR-5	DCF Method - Gas LDC Group
Attachment ES-VVR-6	DCF Method - Non-Regulated Group
Attachment ES-VVR-7	Capital Asset Pricing Model
Attachment ES-VVR-8	Risk Premium Method
Attachment ES-VVR-9	Book Value vs. Market Value Capitalization Ratios

II. SUMMARY OF RECOMMENDATIONS

Q. Based upon your comprehensive analyses and supporting evidence, what have you concluded with respect to the appropriate rate of return for PSNH in this proceeding?

A. Based upon my comprehensive evaluation, I have concluded that the cost of common equity for PSNH's jurisdictional electric utility operations is in the range of 10.30 to 11.30 percent, and that a point estimate at the midpoint of this range, or 10.80 percent, is the appropriate cost of equity to apply in the instant proceeding. However, the Company has elected to propose a cost of equity in this proceeding of 10.30 percent, which falls at the lower-end of the range of reasonableness indicated by my quantitative and qualitative analyses. In my judgment, in view of the fact that long-term capital costs have increased significantly in recent years, and particularly since the time of PSNH's last base rate proceeding, Docket No. DE 19-057, the Company's proposed ROE in the instant proceeding represents a conservative estimate of its cost of equity in the current capital markets environment. Based upon the Company's proposed cost of equity of 10.30 percent, I have further determined that PSNH's weighted average cost of capital is 7.44 percent**,** which is based on the Company's five-quarter average pro-forma capital structure as of December 31, 2024 as further outlined in Attachment ES-REVREQ-1, Schedule ES-REVREQ-40 and the joint direct testimony of Ashley N. Botelho and Yi-An Chen ("Permanent Rate Revenue-Requirement Analysis Testimony"). This resulting overall cost of capital, if adopted by the Commission, will provide PSNH the opportunity to earn the prevailing opportunity cost of capital, maintain its financial integrity, and attract capital at reasonable terms.

Q. What general approach have you taken in determining the cost of common equity in this proceeding?

A. To properly estimate PSNH's cost of equity, I have analyzed market-derived data and other financial information for each of the companies comprising three separate proxy groups. Considering that investors utilize this very same information in assessing risk and making investment decisions, it provides a reliable basis for estimating the cost of equity for the Company's electric utility operations. In total, I evaluated the market and financial data of 27 companies, including eleven companies comprising the Electric Group, six companies comprising the Gas LDC Group, and ten companies comprising the Non-Regulated Group. I will discuss the selection criteria I utilized in developing each of these proxy groups later in my testimony.

During my evaluation, I applied three well-recognized analytical models to the market and financial data of the selected proxy group companies. These models include the Discounted Cash Flow ("DCF") model, Capital Asset Pricing Model ("CAPM"), and the Risk Premium Method ("RPM"). In addition, I have also evaluated two other model variants of the CAPM, specifically, the "CAPM with size adjustment", and the Empirical CAPM ("ECAPM"), both of which have been validated by empirical research. Using the multi-faceted analytical approach described above, my evaluation yielded fifteen individual estimates of the cost of equity for PSNH, thereby ensuring a thorough and comprehensive analysis.

Q. Please elaborate further on how you completed your cost of equity analyses using market-derived data and other financial information for the proxy groups?

A. With respect to the DCF analyses, I evaluated the proxy group companies on an individual basis, which resulted in a separate cost of equity estimate for each company. By taking this approach, I was able to identify anomalous or "outlier" results at the individual company level which did not pass fundamental tests of economic logic. I then eliminated these outlier results from further consideration based upon both "high-end" and "low-end" outlier thresholds as established by regulatory precedent.[1] The fundamental advantage of employing this approach is that it completely removes the effects of anomalous results from the cost of equity evaluation process. In my judgment, this approach is clearly preferable to the "total group approach," which simply averages the data of all proxy group companies, irrespective of whether outlier results are included or not. As such, the total group approach effectively blends in the effects of anomalous results into the cost of equity evaluation process.

Notwithstanding the foregoing, with respect to the CAPM and RPM analyses, the respective proxy groups were evaluated on a group average basis rather than on an individual company basis. This is necessary because virtually all of the input variables into these two analytical models are non-company specific variables[2] with the sole exception of beta, meaning that under these two approaches, company-specific input anomalies will

[1] *See*, FERC Opinion 569 (November 21, 2019), Opinion 569-A (May 21, 2020) and Opinion 569-B (November 19, 2020).

[2] For example, the risk-free rate of return, the level of corporate bond yields and the overall market rate of return.

have less of an impact on the cost of equity estimate as compared to the other analytical methods.

Q. How did you derive your cost of equity recommendations for PSNH using the proxy group results?

A. I developed my cost of equity recommendations after carefully evaluating the individual cost of equity estimates that were derived from applying the various analytical models to the market and financial data of the proxy group companies. Using a variety of analytical models in conjunction with multiple comparable risk proxy groups ensures that a diversity of investor perspectives are incorporated into the cost of capital evaluation, thus providing a solid foundation upon which the analyst can apply his/her informed judgment in making a cost of equity recommendation. The results of my evaluation, which yielded fifteen individual estimates of the cost of equity, are summarized in Table 2. Additional support for the results of my evaluation can be found in Table 8, Table 9, Table 10, Table 13 and Table 14, for each of the analytical models I evaluated, respectively.

Table 2
Indicated Cost of Equity for the Proxy Groups

Method/Model	Electric Group	Gas LDC Group	Non-Regulated Group
DCF Method	10.79%	10.44%	10.90%
Traditional CAPM	10.67%	10.47%	10.61%
CAPM (w/size adj.)	11.28%	11.11%	10.55%
ECAPM	10.83%	10.68%	10.79%
Risk Premium Method	10.93%	10.74%	11.11%

Considering that this proceeding relates to PSNH's electric distribution operations, I have placed primary emphasis on the analytical model results yielded for the Electric Group in forming my overall cost of equity recommendations. As reflected in Table 3, an analysis of the above results for the Electric Group yielded the following measures of central tendency for each of the analytical methods employed.

Table 3
Cost of Equity Estimates
Measures of Central Tendency
Electric Group

Median DCF Result	10.79%
Average DCF Result	10.79%
Median CAPM Result	10.83%
Average CAPM Result	10.93%
Median RPM Result	10.93%
Average RPM Result	10.93%

It is further instructive to evaluate a broader array of cost of equity estimates developed by referencing complementary proxy groups, such as the Gas LDC Group and the Non-Regulated Group. I will further discuss the rationale for evaluating these complementary proxy groups later in my testimony, but in essence they provide a useful adjunctive analysis that incorporates a broader array of investor perspectives into the cost of equity evaluation process. Accordingly, as reflected in Table 4, I have also presented the composite results for all three of the proxy groups I evaluated, which yielded the following measures of central tendency for each of the analytical methods employed.

Table 4 Cost of Equity Estimates Measures of Central Tendency Composite - All Three Proxy Groups	
Median DCF Result	10.79%
Average DCF Result	10.71%
Median CAPM Result	10.68%
Average CAPM Result	10.78%
Median RPM Result	10.93%
Average RPM Result	10.93%

Based upon the results presented in Table 2, Table 3 and Table 4 above, I have concluded that a reasonable estimate of PSNH's cost of equity in the current market environment is in the range of 10.30 percent - 11.30 percent, and that the Commission should adopt a cost of equity at the midpoint of this range, or 10.80 percent, in the determination of a fair rate of return for PSNH's jurisdictional electric operations. However, as noted earlier, the Company has elected to propose a cost of equity in this proceeding of 10.30 percent, which falls at the lower-end of the range of reasonableness indicated by my quantitative and qualitative evaluations.

III. CAPITAL ATTRACTION AND AUTHORIZED ROES

Q. Does the authorized ROE granted to a regulated utility have an impact on the utility's ability to attract the investment capital that is required to honor its public service obligations?

A. Yes. It is important to note that regulated utilities do not only compete with other utility companies to attract investor capital, as they must also compete with an entire universe of

risk-comparable companies, irrespective of industry classification or level of regulatory oversight. Consistent with the concept of opportunity cost and the comparable earnings standard, to attract sufficient capital to support its public service obligations, PSNH must provide a return to its investors that is similar to the returns offered by other companies of comparable risk. Otherwise, investor capital will eventually flow to its most productive use elsewhere.

Q. In your judgment, has the level of competition for investment capital to fund utility infrastructure investments intensified in recent years?

A. Yes, and this is largely attributable to the marked increase in utility capital expenditures in recent years. For example, during 2023, the U.S. utility industry made record-high levels of infrastructure investments, not only for traditional safety and reliability purposes, but to an increasingly greater extent for investments which facilitate the nation's transition towards renewable energy and decarbonization. A recent publication by the Deloitte Research Center indicates that this recent trend will continue for the foreseeable future, and an ongoing challenge for utilities will be accessing the necessary capital to finance these investments. In this regard, the Deloitte Research Center publication makes the following observations:

> The electric power industry is preparing for as much as a tripling of US electricity demand within the next couple of decades. Electrification of the transportation, building, and industrial segments continues to pick up speed in many parts of the country. At the same time, growth of data centers using energy-intensive applications such as AI is expected to further boost demand. Some utilities in high EV adoption areas have already raised projections, with Southern California Edison increasing its estimate from 60% load growth by 2045 to 80%. More will likely follow in 2024 and beyond.

> ….
> To help prepare for accelerating electricity demand, many utilities are increasing load forecasts. They're analyzing their resource mix and working to determine how to optimize it while serving increased load, meeting decarbonization goals, and maintaining reliability. They're assessing infrastructure investment needs, estimating costs, and balancing them against customer affordability.
> ….
> As power and utilities sector capital expenditures reach new heights and continue to rise well into 2024, companies are exploring a variety of funding sources to help foot the bill. S&P's sample group of large energy utilities is expected to spend nearly US$171 billion in 2023, up more than 18% YoY, and projected to rise further in 2024 to 2025. Costs are mounting to upgrade and modernize the grid, harden it against severe weather, prepare for rising demand, and source more renewable energy.[3]

Q. Are you aware of any recent examples where a state regulatory commission rate order resulted in a utility electing to reduce its planned infrastructure investments?

A. Yes. During its Q4, 2023 earnings call, Exelon announced that it would be reducing its distribution-related capital spending plan for the company's Commonwealth Edison ("ComEd") subsidiary by $1.25 billion as a result of a December 2023 rate order by the Illinois Commerce Commission ("ICC"). The ICC's rate order rejected ComEd's proposed four-year grid plan and also authorized a 8.91 percent return on equity, which was markedly below the recent national averages of authorized ROEs granted to electric utilities. A recent article from S&P Global described the events that unfolded in the ComEd case as follows:

[3] *2024 Power and Utilities Industry Outlook*, Deloitte Insights, Deloitte Research Center for Energy and Industrials, https://www2.deloitte.com/us/en/insights/industry/power-and-utilities/power-and-utilities-industry-outlook.html.

> Exelon Corp. anticipates spending $1.25 billion less on Illinois utility Commonwealth Edison Co. through 2026 in the wake of regulatory setbacks. The Illinois Commerce Commission in December 2023 determined Commonwealth Edison's (ComEd) four-year grid plan did not adequately describe community benefits, transparency, affordability, or cost-effectiveness and did not comply with the state's Climate and Equitable Jobs Act (CEJA) of 2021.
> ….
> The commission also authorized an 8.91% return on equity (ROE) for ComEd, a substantial decrease from the administrative law judge's recommended 9.28% ROE and the utility's requested 10.50% ROE.
> ….
> "Outright rejection of the grid plan, the challenging financial support for our net distribution investment in the December order and uncertainty around the amount of spend ComEd will be able to recover has caused us to dramatically reduce the originally planned level of distribution investment in Illinois," company executive vice president and CFO Jeanne Jones said Feb. 21 during a fourth-quarter 2023 earnings call. "We simply cannot invest at the same pace under an ROE that does not fairly recognize ComEd's cost of financing to do so, especially in the current interest rate and inflation environment," Jones emphasized.[4]

The ComEd case highlights the fact that regulated utilities must be granted reasonably constructive ROEs in order to attract the investment capital that is necessary to fund their public service obligations. The deployment of investor capital is ultimately a decision surrounding opportunity cost. To the extent that investors have investment opportunities in other utility companies that offer equity returns that are consistent with, or even higher than, the national averages of authorized ROEs, it is only logical that investors will allocate their limited pool of investment capital to these other opportunities. At the same time, and as demonstrated in the ComEd case, to the extent that a utility receives a less than favorable

[4] *Exelon Cuts Illinois Spend by $1.25B through 2026 Following Regulatory Rulings,* S&P Global Market Intelligence (February 21, 2024).

ROE outcome, it is not unreasonable to conclude that the utility's parent company will be more inclined to deploy its limited pool of discretionary capital to those infrastructure projects in other jurisdictions that offer reasonably constructive ROEs.

IV. BACKGROUND INFORMATION

Q. What background information have you considered in evaluating PSNH's cost of common equity and overall fair rate of return?

A. PSNH is a regulated electric utility that serves residential, commercial and industrial customers in multiple regions of New Hampshire. As of December 31, 2023, the Company furnished retail franchise electric service to approximately 539,000 retail customers in 215 cities and towns in New Hampshire. PSNH also serves New England customers through Eversource Energy's electric transmission business. The Company is a wholly-owned subsidiary of Eversource, a holding company under the Public Utility Holding Company Act of 2005, and is headquartered in Boston, Massachusetts and Hartford, Connecticut. Eversource's operating companies deliver energy to approximately 4.4 million electric and gas customers in New England.

V. CURRENT ECONOMIC AND CAPITAL MARKET CONDITIONS

Q. Please provide a brief overview of recent trends in the U.S. economy and capital markets.

A. In spite of the Federal Reserve's best efforts over the past few years to rein-in the recent marked increase in the inflation rate, the U.S. economy nevertheless continued to expand at a fairly robust pace during Q4, 2023. The U.S. Bureau of Economic Analysis (the "BEA") recently reported that the real GDP growth rate for Q4, 2023 was 3.3 percent on

an annualized basis, while the real GDP growth rate for calendar year 2023 was 2.5 percent. Despite much discussion among market observers concerning the prospects of a U.S. economic recession, there was no indication of a looming recession in the Q4, 2023 GDP data. Nevertheless, the BEA's advance estimate of the annualized real GDP growth rate for Q1, 2024 is 1.6 percent, thus reflecting some degree of deceleration in the U.S. economy as compared to calendar-year 2023.

With regard to the U.S. inflation rate, the U.S. Labor Department recently reported that for the period ending April 2024, the 12-month change in the Consumer Price Index (CPI) was 3.4 percent, while the 12-month change in the core CPI, which excludes volatile food and energy prices, was 3.6 percent. The April 2024 data reflected an inflation rate that remained higher than most economists expected, thus suggesting that the Federal Reserve still has additional work to do in moving the U.S. inflation rate downward toward the central bank's targeted rate of 2.0 percent. Nevertheless, when viewed from a recent historical perspective, the April 2024 inflation data continues to reflect an overall trend line moderation in the U.S. inflation rate, particularly when compared to the 40-year high level of inflation recorded during the summer of 2022.[5]

Meanwhile, the U.S. unemployment rate remains near historically low levels, registering a 3.9 percent rate during April 2024. The continuing strength in the U.S. labor market is further reflected in the strong wage gains made by U.S. workers over the past year, as

[5] For example, during June 2022, the annualized consumer price index (CPI) rose to a 40-year high level of 9.1 percent.

workers' average hourly earnings are currently forecasted to increase by 4.0 percent on a year-over-year basis through April 2024.

Q. What specific monetary policy actions has the Federal Reserve taken since March 2022, when the central bank first began to implement its monetary policy shift towards a more restrictive stance?

A. Since the Federal Reserve first initiated its monetary policy shift during March 2022, the central bank has increased the Federal Funds target rate on eleven occasions in a series of Federal Open Market Committee ("FOMC") meetings, as follows:

March 17, 2022 - 25 basis point increase.
May 5, 2022 - 50 basis point increase.
June 16, 2022 - 75 basis point increase.
July 27, 2022 - 75 basis point increase.
September 21, 2022 - 75 basis point increase.
November 2, 2022 - 75 basis point increase.
December 14, 2022 - 50 basis point increase.
February 1, 2023 - 25 basis point increase.
March 22, 2023 - 25 basis point increase.
May 3, 2023 - 25 basis point increase.
July 26, 2023 - 25 basis point increase.

As reflected above, the Federal Reserve's most recent increase in the Federal Funds target rate occurred during its July 25-26, 2023 FOMC meeting, where the target rate was raised from the previous level of 5.00-5.25 percent to 5.25-5.50 percent. As noted earlier, this was the eleventh time that the Federal Reserve raised the target rate since March 2022, in its continuing effort to rein-in the U.S. inflation rate. It is further noteworthy that the

Federal Reserve's monetary policy tightening activities over the past few years has represented the most aggressive tightening cycle that it has implemented over the past 40+ years. In the aggregate, since the Federal Reserve began to implement its policy shift during March 2022, the central bank has raised the Federal Funds target rate by a cumulative amount of 525 basis points (from a starting point of 0.00-0.25 percent to the current level of 5.25-5.50 percent). Meanwhile, the Federal Reserve has continued to gradually liquidate its holdings of U.S. Treasury and mortgage-backed securities (at a combined amount of $95 billion per month), which further supports its objective of monetary policy normalization, and which has the effect of putting additional upward pressure on intermediate-term and long-term interest rates.

Q. Has the Federal Reserve elected to reduce the Federal Funds target rate any further since the July 25-26, 2023 FOMC meeting?

A. No. In the five subsequent FOMC meetings occurring since July 2023, the Federal Reserve did not make any further adjustments to the Federal Funds target rate. In this regard, the Federal Reserve has indicated that the extent of additional monetary policy tightening would be determined by its "ongoing assessments of the incoming data and the evolving outlook and risks".[6]

[6] Transcript of Chair Powell's Press Conference, September 20, 2023, at 1. https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20230920.pdf.

Q. What actions did the Federal Reserve take during the March 19-20, 2024 FOMC meeting?

A. During the March 19th to March 20th FOMC meeting of 2024, the Federal Reserve once again left the Federal Funds target rate unchanged at 5.25 percent – 5.50 percent, but left the door open for reductions in the Federal Funds target rate during the remainder of 2024. Nevertheless, considering that the March 2024 inflation report reflected a higher U.S. inflation rate than market observers anticipated, it remains to be seen whether the Federal Reserve will ultimately delay or have a rate reduction during the remainder of 2024. In any event, after the March 2024 FOMC meeting, the Federal Reserve also reiterated its plans to continue its gradual liquidation of its holdings of U.S. Treasury and mortgage-backed securities (at a combined amount of $95 billion per month).

Q. What actions did the Fed take during the April 30 - May 1, 2024 FOMC meeting?

A. During the April 30-May 1, 2024 FOMC meeting, the Fed once again left the Federal Funds target rate unchanged at 5.25 - 5.50 percent, citing "a lack of further progress" in bringing the inflation rate downward towards the Fed's targeted level of 2.0 percent. As a result of the Fed's decision to maintain the Fed Funds target rate at the current level (5.25%-5.50%), as well as comments made by the Fed in its press release after the FOMC meeting, many market observers now believe that only one rate increase is likely for the remainder of 2024. Furthermore, during the April 30-May 1, 2024 FOMC meeting, the Fed also elected to reduce the pace at which the central bank will liquidate its $7.4 trillion portfolio of security holdings going forward, a process often referred to as Quantitative Tightening. Prior to the April 30-May 1, 2024 FOMC meeting, the Fed's stated policy was to allow

$95.0 billion of maturing U.S. Treasury securities and mortgage-backed securities to roll-off of the Fed's balance sheet each month, but effective as of June 1, 2024, the Fed will reduce the amount to $60.0 billion each month.

Q. After evaluating the recent trends in the U.S. economy and capital markets, what conclusions have you arrived at, particularly as it relates to the Company's long-term capital costs for purposes of the instant proceeding?

A. Long-term capital costs have increased significantly over the past several years. Of particular note, both the 10-year and 30-year U.S. Treasury security yields climbed to recent historical high levels during the first ten months of calendar-year 2023 (through October 2023). The 10-year Treasury yield rose to 4.98 percent during late October 2023, its highest level in more than 16 years (since July 2007), while the 30-year Treasury yield rose to 5.11 percent during mid-October 2023, its highest level in more than 17 years (since July 2006). However, both the 10-year and 30-year Treasury yields have declined somewhat since October 2023, as the U.S. inflation rate has generally trended downward from its recent 40-year high levels. That said, it is important to recognize that longer-term Treasury security yields remain significantly higher than the levels recorded during the time of PSNH's 2019 rate proceeding. The same is true of utility bonds yields, which are also significantly higher in the current market environment as compared to the time of the Company's 2019 rate proceeding. This strongly suggests that other long-term capital costs, including PSNH's cost of equity, have also risen significantly since the Company's last base rate proceeding in 2019.

Q. To what extent have long-term interest rates increased over the past five years, and do they remain higher now than at the time of the Company's 2019 rate proceeding?

A. There is no question that long-term U.S. interest rates have increased significantly over the past five years and are markedly higher today than at the time of the Company's 2019 rate proceeding. For comparison purposes, I have referenced the average bond yields reported during Q2, 2019, which generally corresponds to the Company's May 28, 2019 filing date in its 2019 proceeding. (Docket No. DE 19-057). As can be seen in Table 5 below, since Q2, 2019, the 30-year U.S. Treasury bond yield, which is a proxy for long-term capital costs, has increased by 179 basis points, from 2.78 percent to 4.57 percent as of late-May 2024. Meanwhile, the 10-year U.S. Treasury note yield has risen by 212 basis points since Q2, 2019, from 2.34 percent to 4.46 percent as of late-May 2024.[7]

Table 5
Changes in Key U.S. Interest Rates – Late May, 2024 vs. Q2, 2019

Time Period	30-Year U.S. Treasury Bond Yield (1)	10-Year U.S. Treasury Bond Yield (1)	Long-Term A Rated Utility Bond Yield (2,3)	Long-Term Baa Rated Utility Bond Yield (2,3)
Key Interest Rates – Q2, 2019 (avg.)	2.78%	2.34%	3.96%	4.44%
Key Interest Rates – Late-May 2024	4.57%	4.46%	5.71%	5.94%
Increase – Late-May 2024 vs. Q2, 2019	+1.79%	+2.12%	+1.75%	+1.50%

Source: (1) www.federalreserve.gov and Bloomberg.com (accessed May 27, 2024), (2) Moody's Credit Trends (accessed May 27, 2024), and (3) Mergent Bond Record (March 2024 edition).

[7] Source of data: https://www.federalreserve.gov/DataDownload/default.htm.

Q. Have long-term utility bond yields also increased significantly since Q2, 2019?

A. Yes. As reflected in Table 5 above, the average "A-rated" long-term utility bond yield has increased from 3.96 percent during Q2, 2019 to 5.71 percent as of late-May 2024, thus reflecting an increase of 175 basis points. During this same period, the average "Baa-rated" long-term utility bond yield increased from 4.44 percent to 5.94 percent as of late-May 2024, thus reflecting an increase of 150 basis points.[8]

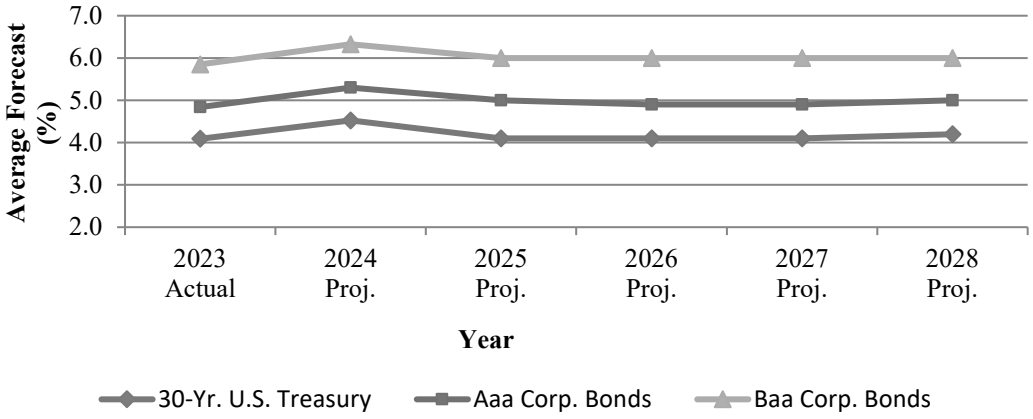
Q. Are economists currently forecasting that U.S. Treasury and corporate bond yields will remain near recent levels over the next 3-5 years?

A. Yes. Prominent economists widely expect that intermediate and long-term interest rates will remain near recently recorded levels over the next 3-5 years. As reflected in Table 6 below, the consensus estimates of prominent economists, as reflected in the Blue Chip Financial Forecasts,[9] are projecting that long-term interest rates will remain near recent levels over the 3-5 year forecast horizon.

[8] Source of data: Mergent Bond Record, March 2024, at 24.

[9] *Blue Chip Financial Forecasts*, Volume 42, No. 12 (December 1, 2023).

Table 6
Blue Chip Financial Forecasts
Interest Rate Projections for Long-Term Bonds



Therefore, considering that bond yields for longer-term U.S. Treasury, corporate and utility bonds, which serve a proxy for long-term capital costs, have increased significantly over the past five years and are expected to remain near these higher levels over the near-to-intermediate term horizon, it is reasonable to conclude that the Company's cost of equity has also increased significantly during this same period and will remain near this higher level over the foreseeable future.

VI. DEVELOPMENT OF THE PROXY GROUPS

Q. Why is it necessary to analyze groups of proxy companies to estimate the cost of equity for PSNH?

A. The cost of equity is an opportunity cost concept, which is determined in the financial markets based upon the relative risk assessments of investors. Simply stated, in order to attract sufficient capital to support their public service obligations, regulated utilities must offer investors a rate of return that is commensurate with returns available on alternative

investments bearing similar risks. Thus, the use of proxy groups is useful in estimating a utility's cost of equity, since each company comprising the proxy group represents an alternative investment opportunity of comparable risk vis-à-vis the subject utility. Regardless of whether the subject utility is publicly-traded or not, proxy group analyses ensure that fair rate of return principles, including comparable earnings, corresponding risks, and the opportunity cost of capital are appropriately considered when estimating a utility's cost of equity.[10] Nonetheless, it should be noted that when the various cost of equity models are applied to the market and financial data of proxy group companies, various model inputs and/or assumptions are required, which contributes to the risk of observation error. For this reason, when possible, the use of larger proxy groups or even multiple proxy groups is recommended to mitigate these effects and to ensure a higher level of confidence in the reliability of the analytical results.

Q. What general approach did you take in developing your utility proxy groups?

A. In developing my utility proxy groups, my objective was to identify a group of publicly-traded utility companies with risk characteristics similar to PSNH. Considering that the instant proceeding involves PSNH's electric distribution operations, I initially developed a proxy group of publicly-traded electric utility holding companies, which I will refer to

[10] These fair rate of return principles were articulated by the U.S. Supreme Court in various landmark case decisions, including *Willcox et. al., Constituting the Public Service Commission of New York v. Consolidated Gas Co*., 212 U.S. 19 (1909); *Bluefield Water Works and Improvement Company v. Public Service Commission of the State of West Virginia*, 262 U.S. 679 (1923); and *Federal Power Commission et al. v. Hope Natural Gas Company*, 320 U.S. 591 (1944). Although the *Hope* and *Bluefield* cases are widely-referenced with regard to fair rate of return standards, the *Consolidated Gas* case was actually the first case where the Supreme Court addressed principles surrounding a fair rate of return for public utility companies.

herein as the Electric Group. The Electric Group constitutes the core proxy group that I evaluated in developing my cost of equity recommendations in this proceeding. Nevertheless, to ensure that I considered the broadest possible representation of investor return expectations, and to further improve the statistical reliability of my analyses, I have also evaluated a gas utility proxy group ("Gas LDC Group") and a non-rate-regulated proxy group ("Non-Regulated Group") in my cost of capital evaluation. Again, although the Electric Group constitutes my core proxy group and therefore provides the primary underlying basis for my cost of equity recommendations, the Gas LDC Group and Non-Regulated Group (which I will demonstrate both have very similar risk profiles as compared to the Electric Group) also provide useful perspective into the return expectations of equity investors. In my judgment, giving due consideration to all three of these proxy groups ensures the broadest possible representation of the risk and return expectations of equity investors for the Company's electric utility operations.

Q. What criteria did you apply in selecting the companies included in your electric utility proxy group?

A. In selecting an electric utility proxy group, my objective was to identify a group of publicly-traded electric utility companies with risk characteristics similar to PSNH, which is not a publicly-traded company. Accordingly, I applied the following selection criteria in making this determination: (i) Value Line Investment Survey Industry Classification as an Electric Utility; (ii) Value Line Safety Rank of "1", "2" or "3"; (iii) S&P corporate credit rating no lower than BBB- and Moody's long-term issuer rating of no lower than Baa3; (iv) operating income from the company's electric utility distribution operations shall equal or

exceed 60% of the company's consolidated operating income; (v) company must currently pay dividends and must not have discontinued or reduced their dividend payments during the previous five years (2019-2023); (vi) company shall not own or operate nuclear power generation facilities; and (vii) company must not have recently been an acquisition target. Applying the above selection criteria yielded a proxy group consisting of the following eleven publicly-traded electric utility companies:

Allete, Inc.
Alliant Energy Corp.
Avista Corp.
CMS Energy Corp.
Consolidated Edison
IDACORP, Inc.
Northwestern Energy
OGE Energy Corp.
Portland General Electric Co.
Sempra Energy
WEC Energy Group

I will refer to this group throughout the remainder of my testimony as the Electric Group.

Q. Have you considered any other proxy groups in estimating the cost of equity for PSNH?

A. Yes. Evaluating multiple proxy groups of comparable risk is beneficial in the cost of equity estimation process for two primary reasons. First, it ensures that a broader array of investor perspectives are incorporated into the cost of equity estimation process. Second, it ensures a higher level of confidence in the statistical reliability of the results produced by the

analysis, which is consistent with the law of large numbers. Accordingly, to ensure a robust sample size that will incorporate a wider array of investor perspectives and obviate potential distortions caused by observation error in the various financial model inputs, I have also evaluated a proxy group of six gas utility companies, and a proxy group of ten non-rate-regulated companies (i.e., the Gas LDC Group and the Non-Regulated Group, respectively). As I will discuss later, both of these complementary proxy groups have risk profiles which are very similar to the Electric Group. Considering that PSNH is not publicly-traded, the analysis of comparative risk metrics was necessary to establish the relative risk relationship between the Company and the Electric Group. In order to facilitate a comparison of the risk profiles of the Gas LDC Group and the Non-Regulated Group to PSNH, this was accomplished indirectly through a comparative risk assessment of the three proxy groups, as based upon published risk indicators. I will discuss the relative risk relationships between the three proxy groups and PSNH later in my testimony.

Q. Why is it appropriate to also evaluate a proxy group of gas utility companies in the instant proceeding?

A. Considering that PSNH is a distribution-only electric utility, its business operations are similar to those of a gas utility, as both gas and electric utilities are involved in the delivery of energy to end-users, and both are subject to rate of return regulation. As noted earlier, evaluating a proxy group of comparable-risk gas utility companies also ensures that a broader array of investor perspectives are incorporated in the cost of equity estimation process, while also providing a higher level of confidence in the statistical reliability of the analytical results produced by the cost of capital study. This approach is consistent with

the comparable earnings standard established in *Hope* and *Bluefield*, since electric utilities are entitled to earn a rate of return commensurate with returns offered by other companies having "corresponding risks," including gas utility companies. Morin provides additional support for this approach in *Modern Regulatory Finance,* where he states the following:

> ….the natural gas distribution business possesses an investment risk profile that is similar in risk to that of investment-grade combination electric and gas utilities. The latter possess economic characteristics similar to those of natural gas distribution utilities as they are both involved in the distribution of energy services products at regulated rates in a cyclical and weather-sensitive market. They both employ a capital-intensive network with similar physical characteristics. They are both subject to rate of return regulation.[11]

Therefore, to ensure the broadest possible representation of investor perspectives in the cost of equity estimation process, the Gas LDC Group serves as a useful complement to the Electric Group.

Q. What other evidence can you provide which demonstrates that gas utilities have a similar risk profile to electric utilities, and therefore that your Gas LDC Group provides a suitable complement to your Electric Group in estimating PSNH's cost of equity?

A. As I will discuss in further detail later, the respective composite long-term credit ratings of the Gas LDC Group and the Electric Group reflect a one-notch ratings differential, which strongly suggests that these two proxy groups have similar risk profiles. In addition, the authorized ROEs historically granted to gas and electric utilities by state regulatory commissions provides additional evidence. For example, the national average of

[11] Roger A. Morin, *Modern Regulatory Finance* (PUR Books LLC, 2021), at 445.

authorized ROEs granted to electric utilities over the past 43 years (1981 to 2023), has been approximately 11 basis points[12] higher than the national average of ROEs granted to gas utilities. During the past 10-year period (2014 to 2023), the national average of authorized ROEs granted to electric utilities was approximately 4 basis points[13] higher than the average ROEs granted to gas utilities. However, this relationship was reversed during the most recent 5-year period (2019 to 2023), during which time the national average of authorized ROEs for gas utilities was approximately six basis points[14] higher than the national average of ROEs granted to electric utilities. In other words, depending upon which particular historical period is analyzed, either gas or electric utilities may be granted slightly higher (or slightly lower) ROEs as based on the national averages, but over the longer-run, they will be largely consistent. If state regulatory commissions throughout the nation believed that the risk differential between gas and electric utilities was more significant, this would have been demonstrated by a greater disparity in the authorized ROEs that have historically been granted to gas versus electric utilities.

Q. What criteria did you use to select the companies included in your Gas LDC Group?

A. In developing the Gas LDC Group, my objective was to identify a group of publicly-traded gas utility companies with risk characteristics similar to the Electric Group. Accordingly,

[12] *The Cost of Capital – A Practitioner's Guide*, D. Parcell, Society of Utility and Regulatory Financial Analysts, (2020), quoting Regulatory Research Associates, at 93; and *RRA Regulatory Focus, Major Energy Rate Case Decisions in the U.S.-January-December 2023,* Regulatory Research Associates, S&P Global Market Intelligence, February 6, 2024, at Table 1.

[13] *RRA Regulatory Focus, Major Energy Rate Case Decisions in the U.S. - January-December 2023,* Regulatory Research Associates, S&P Global Market Intelligence, February 6, 2024, at Table 1.

[14] *RRA Regulatory Focus, Major Energy Rate Case Decisions in the U.S. - January-December 2023,* Regulatory Research Associates, S&P Global Market Intelligence, February 6, 2024, at Table 1.

I applied the following selection criteria in making this determination: (i) Value Line Investment Survey Industry Classification as a Natural Gas Utility; (ii) Value Line Safety Rank of "1," "2" or "3"; (iii) S&P corporate credit rating no lower than BBB-, or Moody's long-term issuer rating of no lower than Baa3; (iv) operating income from the company's regulated gas distribution operations equals or exceeds 50 percent of the company's consolidated operating income; (v) company must currently pay dividends and must not have discontinued or reduced its dividend during the previous five years (2019-2023); (vi) company must have significant revenue stabilization mechanisms in place; and (vii) company is not, and has not recently been, an acquisition target. Applying the above selection criteria yielded a proxy group that is comprised of the following six publicly-traded natural gas distribution holding companies:

Atmos Energy Corp.
New Jersey Resources Corp.
NiSource Inc.
Northwest Natural Gas Co.
ONE Gas, Inc.
Spire, Inc.

Throughout the remainder of my testimony, I will refer to this proxy group as the "Gas LDC Group."

Q. Why is it also appropriate to evaluate a proxy group of non-rate-regulated companies when estimating PSNH's cost of equity?

A. Under the fair rate of return standards established in *Hope* and *Bluefield*, the U.S. Supreme Court determined that regulated utilities are entitled to earn a rate of return commensurate with other companies having comparable risks, irrespective of their business activities or the extent to which they are regulated. For example, in *Bluefield,* the Supreme Court concluded:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties.[15]

It is important to note that within its *Bluefield* opinion, the Supreme Court specifically stated that public utilities should be permitted to earn a return that is equal to the returns on "*investments in other business undertakings,"* provided they have corresponding risks. By virtue of its reference to *"other business undertakings,"* the Supreme Court implicitly endorsed the use of non-utility proxy groups in the determination of a fair rate of return for utilities. Furthermore, in the *Hope* decision, the Supreme Court concluded:

> By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks.[16]

[15] *Bluefield Water Works and Improvement Company v. Public Service Commission of the State of West Virginia*, 262 U.S. 679, 692 (1923).

[16] *Federal Power Commission et.al. v. Hope Natural Gas Company*, 320 U.S. 591, 603 (1944).

It is clear then, based upon the decisions of the Supreme Court in these landmark cases, that the use of non-rate-regulated proxy companies in the determination of a utility's cost of equity is a sound practice, and is consistent with the comparable earnings standard established in these cases. After all, utilities do not only compete with other utility companies for investor capital. They must also compete with an entire universe of risk-comparable companies, irrespective of industry classification and level of regulatory oversight. Therefore, in order to attract sufficient capital to support its public service obligations, and consistent with the concept of opportunity cost, PSNH must provide a return to its investors that is similar to the returns offered by non-rate-regulated companies of comparable risk. Otherwise, over the long run, investor capital will simply flow to its most productive use elsewhere.

It is also important to note that cost-of-service ratemaking is intended to be a substitute for competition. That is, the objective of rate regulation is to produce the same results that would be achieved under the forces of market competition. In particular, it is the phenomenon of "competitive equilibrium" that rate regulation is intended to replicate, where, in the long run, market forces limit companies to earning returns that are no greater than, but also no less than, investors' minimum required rate of return. Expressed in microeconomic terms, long-run equilibrium is achieved where firms only earn minimally-required levels of "normal profits," while excessive profits, often referred to as "economic profits," are by definition equal to zero. Accordingly, the returns of regulated utilities should be no lower than the returns of comparable risk companies which operate under the

constraints of market competition. Considering that this proxy group is demonstrably comparable on a total risk basis to the Electric Group, its use is consistent with the fair rate of return standards established in *Hope* and *Bluefield.*

Q. What criteria did you use to select the companies included in the Non-Regulated Group?

A. In selecting the Non-Regulated Group, my objective was to identify a group of publicly-traded domestic companies with a risk profile either equivalent to, or preferably lower than, the Electric Group. This approach is designed to ensure a conservative analysis when applying the various cost of equity models to the market and financial data of the Non-Regulated Group companies. To achieve this objective, I applied the following screening criteria in selecting companies for inclusion in the Non-Regulated Group: (i) Value Line Investment Survey Classification as a Conservative Stock, which is defined as stocks having a Value Line Safety Rank of no lower than "1" (highest rank for relative safety); (ii) Value Line beta ranging between 0.80 and 1.00; (iii) Value Line Financial Strength Rating of "A" or higher; (iv) S&P corporate credit rating that is no lower than BBB-, or Moody's long-term issuer rating of no lower than Baa3; (v) company shall not be in the gas and/or electric distribution business, and shall not be an investment, financial services, pharmaceutical, life sciences, medical technology, hardware/software, or defense contractor company; (vi) the company must currently pay dividends and must not have discontinued or reduced their dividend payments during the previous five years (2019-2023); and (vii) the company must have at least one consensus earnings estimate published by an information service provider such as Thomson Reuters or Zacks. Applying these

highly-selective criteria yielded the Non-Regulated Group, which is comprised of ten lower-risk companies which operate in the consumer staple, food and beverage, home improvement, waste management, industrial supply, and chemicals processing sectors of the economy. The ten companies comprising the Non-Regulated Group are as follows:

Air Products and Chemicals, Inc.
Brown Forman Corp.
Coca-Cola Co.
Home Depot, Inc.
Illinois Tool Works, Inc.
McCormick & Co.
McDonald's Corp.
Mondelez International, Inc.
Republic Services, Inc.
W.W. Grainger, Inc.

VII. COMPARATIVE RISK ASSESSMENT

Q. Why is it necessary to complete a comparative risk assessment between PSNH and the Electric Group?

A. Considering that the Electric Group is the core proxy group that I have referenced in this proceeding, where market-derived information for the Electric Group companies is used to estimate PSNH's cost of equity, it is critical that this proxy group is risk-comparable to the Company. If material differences in risk are identified, the analyst must apply his/her informed judgment in determining whether further adjustments are required to the cost of equity estimates indicated by application of the various analytical models. Because PSNH is not publicly-traded, market-based financial information is not available for the

Company. Therefore, in conducting my comparative risk assessment, I have instead analyzed various widely-recognized business and financial risk metrics, none of which are dependent upon stock prices or other market-based information.

Q. Please elaborate further on the specific business risks you evaluated in conducting your comparative risk assessment.

A. With regard to business risks, I evaluated a number of factors which are generally categorized as either regulatory risks or other business risks. I will first address the various forms of regulatory risk that I evaluated.

A. Regulatory Risk

There is no question that investor-perceived differences in regulatory risk can influence the investment decisions of both debt and equity investors. While conducting their investment risk assessments, investors will consider the regulatory environments in which the utility subsidiaries of a utility holding company operate. From an investor's perspective, a more constructive regulatory environment is generally deemed to be an environment with lower regulatory risk, while a less constructive environment is generally deemed to be an environment with higher regulatory risk. It is no surprise that both utility stock and fixed-income investors are focused on the differences in regulatory risk among the respective U.S. regulatory jurisdictions. Indeed, in assessing the credit quality of utility companies, the rating agencies ascribe a significant portion of a utility's overall business risk profile to regulatory-related factors. In fact, the regulatory climate in which a utility operates can impact overall credit quality more than any other single factor. This was well-articulated in Standard and Poor's ("S&P") publication titled *Assessing U.S. Investor-Owned Utility*

Regulatory Environments, which describes the impact of regulatory climate on a utility's credit quality and investment risk as follows:

> Regulatory advantage is the most heavily weighted factor when Standard and Poor's Ratings Services analyzes a regulated utility's business risk profile. One significant aspect of regulatory risk that influences credit quality is the regulatory environment in the jurisdictions where a utility operates[17].

In another publication titled *Key Credit Factors for the Regulated Utilities Industry,* S&P further describes the impact of the regulatory framework on a utility's credit and investment risk as follows:

> The regulatory framework/regime's influence is of critical importance when assessing regulated utilities' credit risk because it defines the environment in which a utility operates and has a significant bearing on a utility's financial performance. We base our assessment of the regulatory framework's relative credit supportiveness on our view of how regulatory stability, efficiency of tariff setting procedures, financial stability, and regulatory independence protect a utility's credit quality and its ability to recover costs and earn a timely return[18].

Similarly, when evaluating key factors in determining a utility company's credit quality, Moody's Investor Services ascribes a 50 percent weighting to regulatory-related factors, including a 25 percent weighting on the applicable regulatory framework, and a 25 percent weighting on a utility's ability to recover its costs and earn adequate returns[19].

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[17] "Assessing U.S. Investor-Owned Utility Regulatory Environments", *Standard & Poor's Ratings Direct,* May 18, 2015, p.2.

[18] "Key Credit Factors for the Regulated Utilities Industry", *S&P Global Ratings,* July 22, 2020, p.4.

[19] *See,* "Regulated Electric and Gas Utilities", *Moody's Investors Service, Rating Methodology* (June 23, 2017), at 4.

Q. Understanding that equity investors typically consider a utility's regulatory climate in conducting their relative risk assessments, have you completed a comparative analysis which evaluates how investors are likely to perceive the regulatory environment in which PSNH operates, versus the environment in which the Electric Group companies operate?

A. Yes. In conducting my comparative risk analysis, I have evaluated the State Regulatory Evaluations[20] published by Regulatory Research Associates ("RRA"), which is widely-referenced by the investment community and therefore influences the risk perceptions of investors. In this publication, RRA ranks the regulatory climates of the respective 53 U.S. jurisdictions from the perspective of investors, using three principal rating categories, which are: "Above Average," "Average" and "Below Average." Jurisdictions which are assigned rankings of "Above Average" are considered to be more-constructive, lower-risk regulatory environments, while at the other end of the spectrum, jurisdictions rated "Below Average" are considered to be less-constructive, higher-risk regulatory environments. RRA further delineates relative rankings within each of the three principal rating categories, which are identified by the numerical designations "1", "2" and "3". The designation "1" indicates a more constructive rating with the principal rating category, while the designation "2" represents a mid-range rating, and finally, the designation "3" indicates a less constructive rating within the principal rating category. For purposes of my comparative analysis, I have assigned a ranking scale ranging from "1" (which corresponds to the "Above Average" principal rating category and a numeric designation

[20] *RRA Regulatory Focus, State Regulatory Evaluations - Energy,* Regulatory Research Associates, March 1, 2024.

of "1" or "Above Average-1) to "9" (which corresponds to the "Below Average" principal rating category and a numeric designation of "3" or "Below Average-3"). Using this approach, I have determined that the weighted average ranking for those jurisdictions in which the Electric Group companies operate is currently "4.70" (which corresponds to an overall composite rating of between "Average-1" and "Average-2"), while the ranking for the New Hampshire jurisdiction in which the Company operates is currently "5.00" (which indicates an overall rating of "Average-2").

Therefore, considering that RRA's State Regulatory Evaluations are widely-referenced by the investment community, investors are very likely to conclude that on an overall basis, the Electric Group companies operate in lower-risk regulatory environments as compared to the Company. As discussed earlier, since regulatory risk represents a major component of a utility's overall business risk profile, it is reasonable to expect that on this basis alone, investors would ascribe a higher level of business risk to PSNH as compared to the Electric Group.

Q. Please elaborate further on the other regulatory risks you evaluated in conducting your comparative risk assessment.

A. I also evaluated the following indicators of regulatory risk, which to some extent are already incorporated into the state regulatory evaluations published by RRA.

- Test-Year policy in the state jurisdiction;
- Recent authorized ROEs granted in the jurisdiction;
- Utilization of regulatory mechanisms in the jurisdiction, including revenue decoupling and infrastructure cost recovery mechanisms.

Test-Year Policy. While PSNH utilizes a historical test year that incorporates known and measurable changes, approximately two-thirds of the operating utilities comprising the Electric Group utilize a forecasted test year. This suggests that the Company is subject to a greater degree of cost recovery lag with respect to any expected increases in its operating and/or capital costs as compared to the Electric Group. PSNH therefore has a somewhat higher risk profile versus the Electric Group as it relates to cost recovery delays or regulatory lag. Annual Step Adjustments have provided revenue support on a limited and lagged basis contributing to the higher risk profile versus the Electric Group. The Company's PBR proposal included in this proceeding would provide some level of revenue support between base distribution rate cases, but it also limits revenue support for capital projects be limited based on a historical basis and does not eliminate regulatory lag.

Authorized ROEs. As part of the decision-making process regarding to the deployment of investment capital, utility stock investors are keenly focused on the authorized ROEs granted to regulated utilities, as well as the utility's ability to actually earn the authorized ROE. Considering that the authorized ROEs granted to New Hampshire's gas and electric utilities in recent years have been below the national averages of authorized ROEs as reported by Regulatory Research Associates, this has the effect of causing the risk-and-return proposition to be less appealing for utility investments in New Hampshire, which ultimately has the effect of increasing the risk profile of the State's regulated utilities from the perspective of utility stock investors.

Utilization of Decoupling Mechanisms. As reflected in Attachment ES-VVR-3, the majority of the operating utilities comprising the Electric Group utilize either full or partial revenue decoupling mechanisms. However, PSNH currently only benefits from limited revenue decoupling through the lost base revenues ("LBR") mechanism under the Regulatory Reconciliation Adjustment for net metering impacts, and also under the Systems Benefits Charge ("SBC") for energy efficiency program impacts. Therefore, PSNH's limited decoupling mechanism through the LBR is not as comprehensive as the decoupling mechanisms employed by the majority of the operating utilities comprising the Electric Group. As part of this proceeding, the Company has included a full revenue decoupling proposal should the Commission seek to adopt it moving forward, but the Company is not recommending the Commission due so in order to avoid an additional annual review process, and to allow for revenue support provided by increasing sales volumes due to electrification and other factors can provide additional revenue to support the growing system investment needs. While this makes sense for the reasons described elsewhere in this filing, not having revenue decoupling in place does increase the Company's relative risk profile versus the Electric Group, as the Company is subject to a greater degree of revenue variability.

Utilization of Infrastructure Tracking Mechanisms. As reflected in Attachment ES-VVR-3, the majority of the operating utilities of the Electric Group utilize either a forward test year and/or infrastructure tracking mechanisms. In contrast, PSNH does not currently benefit from a forward test year or an infrastructure cost recovery mechanism. Although

the Company is proposing to implement a PBR Plan, inclusive of a capital funding mechanism called the "K-Bar", it is my understanding that that mechanism continues to reflect regulatory lag, since the Company's capital infrastructure investment needs are increasing at a rate faster than that mechanism allows for revenue support recognition. This increases PSNH's risk profile to some extent versus the Electric Group, as the Company is subject to longer delays in cost recovery (i.e., regulatory lag) with respect to its infrastructure investments.

Q. Please summarize your findings with regard to the differences in regulatory risks that you identified between PSNH and the Electric Group.

A. In summary, each of the aforementioned regulatory risk indicators that I evaluated suggest that the Company has a higher regulatory risk profile as compared to the Electric Group. This conclusion is borne out by the fact that RRA's State Regulatory Evaluations suggest that utility stock investors are likely to conclude that on an overall composite basis, the Electric Group companies operate in lower-risk regulatory environments as compared to the Company.

B. Other Business Risks

Q. Please elaborate further on the other business risks you evaluated as part of our comparative risk assessment.

A. The other business risks I evaluated include: (1) relative size, and (2) the volatility of returns on book equity. I present the results of these evaluations below and also within Attachment ES-VVR-2 to my testimony.

Relative Size. Based on a total book capitalization of approximately $4.0 billion, PSNH's book capitalization is approximately one-fifth the size of the average book capitalization of the Electric Group ($19.9 billion). The finance literature has made clear that smaller capitalization companies have historically earned returns that in excess of the returns implied by their betas, and those returns are also generally higher than the returns earned by larger capitalization firms. Consistent with the risk-and-return investment principle, this suggests that smaller capitalization companies, including PSNH, have a higher investment risk profile as compared to larger capitalization firms, such as the companies comprising the Electric Group.

Volatility of Return on Book Equity. In the absence of observable market data, both the standard deviation and coefficient of variation of a time series of annual book ROEs can serve as suitable risk measurement substitutes for beta. Although standard deviation is a measure of total risk, while beta is a measure of non-diversifiable systematic risk, these two risk measures have been shown to be highly correlated. The coefficient of variation is calculated as the ratio of the standard deviation of ROE to the mean ROE, which facilitates a comparison of the degree of variation from one data series to another, even if the respective mean ROEs differ significantly. Higher calculated values for the standard deviation and coefficient of variation indicate greater volatility in achieved ROEs, which corresponds to a higher overall level of investment risk. For the period 2019-2023, the standard deviation of achieved ROEs was 0.3 percent for PSNH, and 0.7 percent for the Electric Group. For the same period, the coefficient of variation was 0.03 for PSNH and

0.08 for the Electric Group. This results suggest that the achieved ROEs for both PSNH and the Electric Group reflect low levels of relative volatility, albeit with the Company reflecting slightly less volatility than the Electric Group.

Q. Please summarize your findings with regard to the differences in other business risks that you identified between PSNH and the Electric Group.

A. Based upon my evaluation of the aforementioned other business risks, I have concluded that PSNH and the Electric Group are of comparable risk.

C. Financial Risk

Q. Please elaborate further on the measures of financial risk that you evaluated as a component of your comparative risk assessment.

A. The measures of financial risk that I evaluated include the following credit metric ratios: (1) the equity capitalization ratio; (2) the EBITDA-to-interest coverage ratio; and (3) the FFO to adjusted-total-debt ratio. For each of these measures, I have evaluated the five-year historical period of 2019-2023, along with the five-year historical averages. The results of these evaluations are presented in Attachment ES-VVR-2 to my direct testimony.

Q. What conclusions have you drawn after evaluating the aforementioned credit metric ratios for the Company and the Electric Group?

A. After evaluating the respective credit metric ratios identified above, I have concluded that PSNH has a somewhat lower financial risk profile as compared to composite values for the Electric Group.

Q. Did you also review of the long-term credit ratings of the Company as well as the composite credit ratings of the Electric Group, and what conclusions did you arrive at based upon this review?

A. Yes, and I reached the same conclusions that I reached after reviewing the individual credit metrics for both the Company and the Electric Group. Again, I concluded that the Company has a somewhat lower financial risk profile as compared to the Electric Group.

Q. Please elaborate further on your findings with respect to the long-term credit ratings of the Company versus the composite credit ratings of the Electric Group.

A. Standard & Poor's (S&P) has presently assigned a corporate credit rating of "A" with a negative outlook for PSNH and a composite corporate credit rating of "BBB+" for the Electric Group companies. Moody's has assigned a long-term issuer rating of "A3" for PSNH and a composite long-term issuer rating of "Baa1" for the Electric Group companies. Additional information on the Electric Group's average credit ratings can be found on page 6 of Attachment ES-VVR-4. When compared to the composite ratings of the Electric Group, the Company's credit ratings are two notches higher[21] under S&P's rating methodology, and one notch higher under Moody's ratings methodology.

Although these respective credit ratings are not dramatically different, they do reflect a somewhat lower financial risk profile for the Company. At the same time, it is important to recognize that a one or two notch differential in long-term credit ratings in the recent capital markets environment would only have the effect of changing a utility's long-term

[21] S&P currently reflects a negative outlook for the Company's long-term credit rating. The two-notch differential cited assumes that S&P does not implement a ratings downgrade.

borrowing costs by approximately 10-15 basis points[22]. Moreover, considering that a utility's long-term credit ratings do not incorporate the equity-specific risks that I have also evaluated in my comparative risk assessment, the relatively minor differences in credit ratings noted above would not be expected to have a significant impact on the utility's cost of equity.

Q. Please summarize your findings with regard to the differences in financial risk that you identified between PSNH and the Electric Group.

A. Based on my evaluation of the aforementioned measures of financial risk, I have concluded that the Company has a somewhat lower level of financial risk as compared the Electric Group.

Q. What overall conclusions have you drawn from your comparative risk assessment between PSNH and the Electric Group?

A. I have concluded that on an overall basis, the Company has a very similar investment risk profile as compared to the Electric Group. As noted earlier, each of the regulatory risk metrics[23] that I evaluated suggest that the Company has a somewhat higher regulatory risk profile as compared to the Electric Group. At the same time, the other non-regulatory business risk metrics that I evaluated suggest that the Company and the Electric Group have comparable risk profiles. Lastly, the financial risk measures that I evaluated suggest that the Company has a somewhat lower financial risk profile as compared to the Electric Group.

[22] Source of data: Mergent Bond Record, March 2024.

[23] As I noted earlier, regulatory risks are a sub-component of a utility's overall business risk profile.

Therefore, on an overall basis, considering the various components of investment risk, the results of my comparative risk assessment suggest that the Company's investment risk profile is comparable to that of the Electric Group. For this reason, in developing my cost of equity recommendations in this proceeding, I have relied entirely upon the cost of equity estimates yielded by applying each of the respective analytical models to the market and financial data of the proxy group companies, without any need to make any additional risk adjustments to these estimates.

Q. How does the Gas LDC Group compare on a total risk basis to the Electric Group?

A. To facilitate a comparative risk assessment between the respective proxy groups, I have compared each of the proxy groups on the basis of six well-recognized measures of investment risk. The first of these measures is the Value Line beta, which measures a stock's non-diversifiable or systematic risk. The second measure is the Value Line "Safety Rank," which is Value Line's proprietary measure of the total risk of a stock and is determined based upon an equal weighting between Value Line's Financial Strength rating and Stock Price Stability rating. I have also considered the Value Line Financial Strength and Stock Price Stability ratings on an individual basis, which are presented as risk measures three and four. The fifth and sixth measures of investment risk I have evaluated are the long-term credit ratings assigned by S&P and Moody's, respectively. Considering that credit ratings are the product of a comprehensive, multi-dimensional analysis which considers a utility's business risk (which includes regulatory risk) and financial risk, they

provide a useful perspective into the overall investment risk profile of the respective proxy groups.

The summarized results of my comparative risk assessment are presented in Table 7 below. Based upon my evaluation of the aforementioned risk measures, I have concluded that the Gas LDC Group has a slightly lower investment risk profile as compared to the Electric Group. As reflected in Table 7 below, this conclusion is based upon the fact that the Gas LDC Group's average Value Line beta, Value Line financial strength rating, Value Line stock price stability rating, and long-term credit ratings from S&P and Moody's each reflect a slightly lower level of investment risk as compared to the Electric Group. At the same time, the remaining risk indicator that I have evaluated, the Value Line safety ranking, suggests that the Gas LDC Group and the Electric Group are of comparable risk. Based upon these findings, I have concluded that although the Gas LDC Group reflects a slightly lower risk profile as compared to the Electric Group, it nevertheless provides a useful complementary basis for estimating PSNH's cost of equity in the instant proceeding.

Q. How does the Non-Regulated Group compare on a total risk basis to the Electric Group?

A. Based upon my evaluation of the aforementioned objective risk measures, and as summarized in Table 7 below, I have concluded that the Non-Regulated Group also has a somewhat lower overall investment risk profile as compared to the Electric Group. This

conclusion is based upon the fact that all six of the risk indicators I evaluated[24] indicate that the Non-Regulated Group has a somewhat lower investment risk profile as compared to the Electric Group. Therefore, as was the case with the Gas LDC Group, I have concluded that the Non-Regulated Group also provides a useful and conservative basis for estimating the cost of equity for PSNH's electric operations.

Table 7
Comparative Risk Assessment of Proxy Groups

Risk Measure	Electric Group	Gas LDC Group	Non-Reg. Group
Value Line Beta	0.91	0.88	0.90
Value Line Safety Rank	2	2	1
Value Line Fin. Strength Rating	B++	A	A+
Value Line Stock Price Stability Rating	89	90	95
S&P Long-Term Debt Rating	BBB+	A-	A-
Moody's Long-Term Debt Rating	Baa1	A3	A3

[24] Again, these six risk indicators include the Value Line Beta, Value Line Safety Rank, Value Line Financial Strength Rating, Value Line Stock Price Stability Rating, S&P's long-term debt rating, and Moody's long-term debt rating.

VIII. ANALYSIS OF REGULATORY MECHANISMS

Q. Does the Company currently benefit from a revenue decoupling mechanism, and if yes, how does its compare to the decoupling mechanisms employed by the Electric Group companies?

A. As noted earlier, PSNH currently employs a lost base revenue ("LBR") mechanism under the Regulatory Reconciliation Adjustment for net metering impacts, and under the Systems Benefits Charge ("SBC") for energy efficiency program impacts. The LBR does not address other significant causes of fluctuations in system revenues such as weather variations, which is most often addressed either through a weather normalization adjustment or a comprehensive decoupling mechanism. As part of this proceeding, the Company has included a full revenue decoupling proposal should the Commission seek to adopt it moving forward, but the Company is not recommending the Commission due so in order to avoid an additional annual review process, and to allow for revenue support provided by increasing sales volumes due to electrification and other factors can provide additional revenue to support the growing system investment needs. As reflected within Attachment ES-VVR-3, the majority of the Electric Group companies employ either full or partial decoupling mechanisms, which, on balance, are more comprehensive than the Company's LBR mechanism. This suggests that PSNH's relative risk profile is somewhat higher than the Electric Group, as the Company is subject to a greater degree of revenue variability, particularly when these variations are the result of weather-related factors.

Q. Have you completed a comparative evaluation to determine the extent to which the proxy group companies employ revenue decoupling and infrastructure cost recovery mechanisms?

A. Yes, I have. My evaluation of the revenue stabilization and infrastructure cost recovery mechanisms employed by each of the companies comprising the Electric Group and the Gas LDC Group is presented within Attachment ES-VVR-3. Using information available primarily from Securities and Exchange Commission filings and company prepared investor presentations, my evaluation identified, for each state jurisdiction in which the proxy group companies have utility operations, the specific types of regulatory mechanisms employed in each of those jurisdictions. This is the same approach that investors typically employ in conducting their relative risk assessments among various investment alternatives. This is a critical observation since investors will generally form their risk perceptions with respect to the impacts of regulatory mechanisms largely on the basis of the information contained within a company's SEC filings and other publicly-disclosed information.

Q. Based upon your evaluation of the regulatory mechanisms employed by the proxy group companies, what specific conclusions have you drawn?

A. As reflected in Attachment ES-VVR-3, I have determined that nine of the eleven companies comprising the Electric Group employ a range of revenue stabilization mechanisms, including revenue decoupling, weather normalization and lost revenue or lost margin recovery mechanisms. Therefore, on balance, the full or partial decoupling mechanisms employed by the Electric Group companies are more comprehensive than the Company's LBR mechanism.

My evaluation further determined that ten of the eleven companies comprising the Electric Group either utilize infrastructure cost recovery mechanisms or a forecast test year, while PSNH does not currently utilize an infrastructure mechanism or a forecast test year. Such being the case, PSNH is subject to a greater degree of cost recovery lag with respect to its infrastructure investments, which has the effect of increasing the Company's risk profile relative to the Electric Group.

Furthermore, as reflected in Attachment ES-VVR-3, I have determined that all of the Gas LDC Group companies employ robust forms of revenue stabilization mechanisms (often including weather normalization adjustments), as well as infrastructure cost recovery mechanisms. Therefore, when compared to the companies comprising the Gas LDC Group, PSNH is subject to a higher level of revenue variability as well as a greater degree of cost recovery lag with respect to the Company's infrastructure investments, both of which increases PSNH's risk profile relative to the Gas LDC Group.

IX. COST OF EQUITY ESTIMATES

A. Cost of Equity - General Approach

Q. Please describe the general approach you have taken in estimating the cost of equity for PSNH.

A. To facilitate a thorough analysis of PSNH's cost of equity, I first conducted a comparative risk assessment to establish the risk relationships between the Company and the three proxy groups. I then determined the indicated cost of equity for the proxy groups by applying three widely-recognized cost of equity models to the market and/or financial data of the

proxy group companies. Based on my comparative risk assessment, I concluded that the proxy groups provided an appropriate basis for estimating PSNH's cost of equity, thus indicating that no further risk adjustments were necessary.

Although the cost of equity cannot be directly observed, it can be estimated using a variety of analytical models, each of which attempt to explain and/or predict investor behavior. However, since investor expectations often differ and investors rely on a variety of different sources of information and financial models to make their investment decisions, no single analytical model can possibly capture the broader universe of investor expectations. Moreover, each financial model has its own practical shortcomings, either in the form of rigid underlying assumptions or required model inputs which are dependent upon the subjective judgment of the analyst. For these reasons, in *Risk and Return for Regulated Industries*, Villadsen, Vilbert, Harris and Kolbe present a compelling argument for the use of a variety of analytical methods in estimating a utility's cost of equity, and caution against overreliance on any one particular model, where the authors state the following:

> It is important to recognize explicitly at the outset that models are imperfect. All models are simplifications of reality, and this is perhaps especially true of financial models. Because they cannot and do not capture all the dynamics and complexities of financial markets, asset pricing models can never perfectly determine or explain the actual prices we observe….There is no single, widely accepted, best pricing model – just as there is no consensus on some fundamental issues, such as the efficient market hypothesis (EMH). Analysts have a dizzying array of potential models at their disposal, and it must be acknowledged that cost of capital estimation continues to include art, not just science. The generally recommended "best practice" is therefore to look at a

totality of information from alternative methodologies.[25]

Parcell makes similar observations in *The Cost of Capital - A Practitioner's Guide*, where he maintains the following:

> Investor expectations differ and it is apparent that all investors do not rely upon the same information and models in making investment decisions. Consequently, no single model and model variant can be demonstrated to capture all investor expectations. Furthermore, no single model is so inherently precise that it can be relied on solely to the exclusion of other theoretically sound models….Each model has its own way of examining investor behavior, its own premises, and its own set of simplifications of reality.…Investors clearly do not subscribe to any singular method, nor does the stock price reflect the application of any one single method by investors. Therefore, it is essential that estimates of investors' required rate of return produced by one method be compared with those produced by other methods, and that all cost of equity estimates be required to pass fundamental tests of reasonableness and economic logic.[26]

Consistent with the foregoing well-founded arguments, and to ensure a thorough evaluation of the Company's cost of equity, I have applied a variety of analytical models to the market and/or financial data of the proxy group companies.

B. Discounted Cash Flow Analysis

Q. Please provide an overview of the DCF approach used to estimate the cost of equity.

A. The DCF approach is a commonly-used valuation model, which is based on the fundamental premise that investors value financial assets on the basis of their expected future cash flows, discounted by an appropriate risk-adjusted rate of return. The model

[25] Bente Villadsen, Michael J. Vilbert, Dan Harris and A. Lawrence Kolbe, *Risk and Return for Regulated Industries,* Academic Press, Elsevier Inc. (2017), at 38.

[26] David C. Parcell, *The Cost of Capital - A Practitioner's Guide* (Society of Utility and Regulatory Financial Analysts, 2020 Edition, Copyrighted 2022), at 86.

maintains that the market-determined price of a share of common stock or other financial asset will continually adjust until investors are sufficiently compensated for the level of investment risk they bear. It is only at the point that investors have realized their required rate of return that valuation equilibrium will have been achieved. The objective of the DCF approach is to reproduce this iterative market valuation process in the form of a financial model. Considering that the price of a given share of common stock can be directly observed in the equity market, and that the stock's future dividends and capital gains can be estimated, the DCF model can be successfully rearranged to solve for the cost of common equity. It is this "rearranged" version of the DCF model that is commonly used in utility rate proceedings, as I will discuss herein.

Q. What is the underlying theoretical basis for employing the DCF approach to value financial assets, and how has the DCF approach evolved over the years?

A. The theoretical underpinnings of the DCF approach are consistent with classical valuation theory, which states that the intrinsic value of any security is a function of its future earnings power. Specifically, intrinsic value can be quantified as the present value of the security's future cash flows discounted at the appropriate risk-adjusted rate of return. This concept was first formally advanced by Fisher in *The Rate of Interest,*[27] and was further elaborated upon in his subsequent work, *The Theory of Interest,* wherein Fisher maintained:

[27] Irving Fisher, *The Rate of Interest*, (The Macmillan Company 1907).

> Capital, in the sense of capital value, is simply future income discounted or, in other words, capitalized. The value of any property, or rights to wealth, is its value as a source of income and is found by discounting that expected income.[28]

Fisher's seminal valuation concept, which was first articulated over a century ago, laid the foundation for modern versions of the DCF approach, which both investors and academics continue to rely upon today.

Almost a decade after *The Theory of Interest* was published, Williams expanded upon Fisher's earlier work in valuation theory in his classic publication, *The Theory of Investment Value* (1938). It was here that Williams first expressed in modern economic terms a fully developed DCF equation, which was intended to serve as a valuation model for common stocks. Although Williams emphasized that his DCF equation was a *dividend* discounting model rather than an earnings-based model, he also acknowledged that over the long run, the two approaches would produce equivalent valuation results. Indeed, upon introducing his DCF equation in *The Theory of Investment Value*, Williams explains:

> Let us define the investment value of a stock as the present worth of all the dividends to be paid upon it….
>
> …
>
> Most people will object at once to the foregoing formula for stocks by saying that it should be the present worth of future *earnings*, not future *dividends*. But should not earnings and dividends both give the same answer under the implicit assumptions of our critics? If earnings not paid out in dividends are all successfully reinvested at compound interest for the benefit of the stockholder, as the critics imply, then these earnings should produce dividends later; if not, then they are money lost….
>
> …

[28] Irving Fisher, *The Theory of Interest*, (The Macmillan Company 1930), Part I, Chapter I, Section 7.

> On analysis, therefore, it will be seen that no contradiction really exists between our formula using dividends and the common precept regarding earnings. How to estimate the future dividends for use in our formula is, of course, the difficulty.[29]

The DCF approach introduced by Williams included a general "long-form" equation, which reflected an ongoing series of dividend payments extending into the indefinite future, and a simplified constant growth version of the equation, which was later refined by Gordon and Shapiro.[30]

In subsequent years, Williams' long-form DCF equation was adjusted to accommodate various forms of future cash flows, rather than only dividends, and evolved into a general purpose valuation model. This so-called "general DCF model" continues to be used today in a variety of applications extending beyond security valuation, including corporate finance decision support, real estate development and other financial applications. However, when the general DCF model is employed to value common stocks, the following equation is utilized:

$$P_0 = D_1/(1+K) + D_2/(1+K)^2 + D_3/(1+K)^3 + ...+ D_n/(1+K)^n \quad \text{(Equation 1.1)}$$

Where:

P_0 = current market price of the stock,

D_1 = expected dividend at end of year 1, year 2, year 3, etc.,

n = infinity,

K = investors' expected return on common equity (the discount rate).

[29] John Burr Williams, *The Theory of Investment Value*, (Cambridge, MA, Harvard University Press, 1938) at 55, 57-58.

[30] Myron J. Gordon and Eli Shapiro, "Capital Equipment Analysis: The Required Rate of Profit," *Management Science,* 3 (October 1956) at 102-110.

Q. What form of the DCF model is used to estimate the cost of common equity in utility regulatory proceedings?

A. In practice, the general DCF model can be challenging to apply to common stock valuation, since the model requires that discrete dividend payments be estimated well into the distant future. However, if investors assume that future dividend payments will increase at a constant growth rate each year into perpetuity, the valuation process can be greatly simplified. Drawing upon the constant growth model developed by Williams, and later refined by Gordon and Shapiro, the following constant growth equation can be utilized in valuing common stocks:

$$P_0 = D_1/(K-g) \qquad \text{(Equation 1.2)}$$

Where:

P_0 = current market price of the stock,

D_1 = expected dividends over the next year,

K = investors' expected return on common equity (the discount rate),

g = expected dividend growth rate into perpetuity.

This simplified equation states that a company's stock price is determined by the present value of dividend payments occurring over the next year, plus all subsequent dividend payments growing at a constant annual rate, as discounted by the expected return on common equity. Although the constant growth model is conceptually viable and simplifies

the process of estimating future dividend payments, the model is also premised upon strict underlying assumptions,[31] which are not always observed in reality.

The constant growth equation reflected above can be rearranged to solve for "K," which yields the standard DCF formulation for estimating the cost of common equity, which is expressed as follows:

$$K = D_1/P_0 + g \qquad \text{(Equation 1.3)}$$

It is this standard form of the DCF model that is commonly used in utility rate proceedings. The model is intuitive in that it states that common stock investors have a total return requirement ("K") which is comprised of a forward looking dividend yield component (D_1/P_0), plus the expected growth rate of dividends (and/or stock price appreciation) into perpetuity ("g"). Considering that both components of the dividend yield (D_1 and P_0) can be readily observed through a variety of publicly-available sources, and that the investor expected growth rate can be estimated using a variety of approaches, the analyst can infer "K," the required return on common equity.

[31] The strict assumptions underlying the constant growth DCF model include: (i) dividends and earnings grow at the same constant growth rate (or constant average growth trend); (ii) book value per share and the stock price also grow at the same constant growth rate; (iii) investors expect the same rate of return ("K") in all future periods, implying no changes in risk and a flat yield curve; (iv) the discount rate, "K," must exceed the expected constant growth rate, "g"; (v) a fixed dividend payout ratio will be maintained; (vi) a fixed price-earnings ("P/E") multiple will be maintained; (vii) dividends are only paid at the end of each year; and (viii) no external financing occurs, as growth is financed strictly through the retention of earnings (or alternatively, any new sales of stock only occur at book value). Despite the fact that these assumptions are not always reflective of reality, the constant growth model maintains its usefulness due in its ability to adequately explain investor behavior and the stock market valuation process.

Q. What steps are involved in implementing the DCF constant growth model for estimating the cost of common equity?

A. A detailed discussion of the steps I took in implementing the DCF constant growth model can be found in Appendix A to my testimony. Additionally, Appendix B discusses the treatment of "outlier" DCF results which do not meet threshold tests of reasonableness and economic logic. Appendix C discusses the importance of applying a financial risk adjustment to DCF estimates whenever the market-value based equity capitalization level of the proxy group companies is materially different than the subject utility's book-value based equity capitalization level. In addition, Attachment ES-VVR-9 to my direct testimony provides the supporting capital structure ratios information referenced in Appendix C. Lastly, Appendix D discusses the importance of applying a flotation cost adjustment to the "baseline" cost of equity results under the DCF model.

Q. What cost of equity estimates are indicated for the Electric Group under the DCF approach?

A. A detailed presentation of the DCF results for the Electric Group is presented on pages 1 and 2 of Attachment ES-VVR-4 and is also summarized in Table 8 below.

Table 8
Average DCF Estimates – Electric Group

Calculation Method	Cost of Equity
Earnings (EPS) Forecast	
Yahoo Finance	11.00%
Zacks	10.20%
Value Line	9.90%
Dividend (DPS) Forecast	
Value Line	9.20%
Historical Growth Rates	
EPS (5-10 yr.) – Value Line	9.30%
DPS (5-10 yr.) – Value Line	10.60%
Unadjusted DCF Estimate	10.20%
Flotation Cost Adjustment (10 basis points)	x 1.0102%
Subtotal	10.30%
Market Value-Book Value Financial Risk Adjustment	0.49%
Indicated DCF Estimate	= 10.79%

The average unadjusted DCF estimate for the Electric Group ranged from 9.20 percent to 11.00 percent. It is well-established in the finance literature that investors place the greatest emphasis on the earnings growth estimates of equity analysts in deriving their growth and return expectations for common stocks. For this reason, although I have given consideration to the cost of equity estimates yielded through an evaluation of both earnings and dividend growth rates (both historical and projected), I have placed a somewhat greater emphasis on the cost of equity estimates based on the consensus EPS growth estimates of equity analysts. On this basis, an unadjusted DCF estimate of 10.20 percent is indicated for the Electric Group. After making the required financial risk and flotation cost

adjustments[32] to this value, the results of my analysis indicate a cost of equity of 10.79 percent for the Electric Group.

Q. In your judgment, is the approach you took with your DCF analyses consistent with the Commission's previously stated preference that the analyst also evaluate other growth rate estimates in addition to earnings growth as part of a constant growth DCF analysis[33]?

A. Yes, it is. As noted earlier, my constant growth DCF analyses incorporate historical and projected earnings growth rates as well as historical and projected dividend growth rates, the latter of which is reported by Value Line.

Q. What cost of equity estimates were indicated for the Gas LDC Group using the DCF approach?

A. DCF estimates for each member of the Gas LDC Group are presented on pages 1 and 2 of Attachment ES-VVR-5 and are summarized in Table 9 below. The unadjusted DCF estimates for the Gas LDC Group range from 9.00 percent to 10.30 percent. On an overall basis, an unadjusted DCF estimate of 10.00 percent is indicated for the Gas LDC Group. After making the required financial leverage and flotation cost adjustments to the unadjusted DCF estimate, the results of my analysis indicate a cost of equity of 10.44 percent for the Gas LDC Group.

[32] As noted earlier, the financial risk and flotation cost adjustments that I included in my analysis are further outlined in Appendix C and Appendix D to my direct testimony, respectively.

[33] See, EnergyNorth Natural Gas, Inc., d/b/a National Grid NH, Docket No. DG-08-009, Order No. 24,972 (May 29, 2009), at pp. 59-64.

Table 9 Average DCF Estimates – Gas LDC Group	
Calculation Method	**Cost of Equity**
Earnings (EPS) Forecast	
Yahoo Finance	10.10%
Zacks	10.00%
Value Line	10.30%
Dividend (DPS) Forecast	
Value Line	9.00%
Historical Growth Rates	
EPS (5-10 yr.) – Value Line	9.90%
DPS (5-10 yr.) – Value Line	10.30%
Unadjusted DCF Estimate	10.00%
Flotation Cost Adjustment (10 basis points)	x 1.0102%
Subtotal	10.10%
Market Value-Book Value Financial Risk Adjustment	0.34%
Indicated DCF Estimate	= 10.44%

Q. What cost of equity estimates were indicated for the Non-Regulated Group using the DCF approach?

A. DCF estimates for each member of the Non-Regulated Group are presented on pages 1 and 2 of Attachment ES-VVR-6 and are summarized in Table 10 below. The unadjusted DCF estimates for the Non-Regulated Group range from 9.30 percent to 11.00 percent. On an overall basis, an unadjusted DCF estimate of 10.30 percent is indicated for the Non-Regulated Group. After making the required financial leverage and flotation cost adjustments to this estimate, the results of my DCF analysis indicate a cost of equity of 10.90 percent for the Non-Regulated Group.

Table 10 Average DCF Estimates Non-Regulated Group	
Calculation Method	**Cost of Equity**
Earnings (EPS) Forecast	
Yahoo Finance	9.30%
Zacks	10.50%
Value Line	10.80%
Dividend (DPS) Forecast	
Value Line	9.60%
Historical Growth Rates	
EPS (5-10 yr.) – Value Line	11.00%
DPS (5-10 yr.) – Value Line	10.30%
Unadjusted DCF Estimate	10.30%
Flotation Cost Adjustment (11 basis points)	x 1.0102%
Subtotal	10.41%
Market Value-Book Value Financial Risk Adjustment	0.49%
Indicated DCF Estimate	= 10.90%

Consistent with established regulatory principles, authorized returns for regulated utilities should be similar to returns offered by comparable risk firms operating in the competitive marketplace. This is the case, because, consistent with the regulatory compact, utility regulation is widely-purported to be a substitute for market competition. It is therefore noteworthy that the DCF results for the Non-Regulated Group serve to "operationalize" this very concept, as they do in fact reflect the competitive market result.

C. Capital Asset Pricing Model Analysis

Q. Please provide an overview of the CAPM and the theoretical basis for using it to estimate a utility's cost of equity.

A. The CAPM is a market-based risk and return investment model which derives its theoretical underpinnings from both Capital Market Theory and Modern Portfolio Theory ("MPT").[34] Originally developed by Sharpe and Lintner in the early-mid 1960s for investment analysis purposes, the CAPM is considered an ex-ante, forward-looking model which recognizes that investors are generally risk averse and will demand higher returns in exchange for assuming higher levels of investment risk. The traditional CAPM equation is expressed as follows:

$$K = R_F + \beta(R_M - R_F) \qquad \text{(Equation 1.4)}$$

Where: K = Required rate of return for a stock;
R_F = Expected risk-free rate of return;
β = Beta, or systematic risk of a stock; and
R_M = Expected return for the overall stock market.

The investor required rate of return (K) indicated by the CAPM is equal to the expected risk-free rate of return (R_F) plus a risk premium which is proportional to the level of systematic risk implicit in the security being evaluated. Systematic risk, also referred to as

[34] MPT, which was developed by Harry Markowitz in the early 1950's, heavily influenced William Sharpe's development of the CAPM. MPT advanced the concept of an "efficient frontier" of dominating investment portfolios, which provided the highest rate of return possible for a given level of investment risk, as measured by the portfolio's covariance of returns. Essential concepts from MPT which influenced the development of the CAPM included the risk and return tradeoff relationship, and the value of diversification for eliminating firm-specific investment risk. Markowitz and Sharpe both earned the Nobel Prize in Economics in 1990 for their body of work relative to these classic financial theories.

market risk, is the sole risk element found within the CAPM, and refers to the variability of overall stock market returns, which are largely influenced by socioeconomic and political trends. It is only this systematic risk which commands a return premium within the CAPM, as a critical assumption underlying the model is that investors have already eliminated firm-specific investment risk in their investment portfolios via diversification.

Within the CAPM framework, an individual stock's contribution to the systematic risk of a given portfolio is indicated by the stock's beta (β) coefficient. In essence, the beta coefficient measures the co-variability of the price movements of an individual stock versus the price movements of the total market portfolio. The beta of the market portfolio is equal to 1.0, which reflects a level of variability consistent with the overall stock market. Stocks with beta values *lower* than 1.0 have a lower expected variability and therefore less systematic risk than the overall market, while stocks with betas *higher* than 1.0 have a higher expected variability and thus greater systematic risk than the overall market. To determine the investor-required risk premium for an individual stock, the difference between the expected market return (R_M) and the expected risk-free rate of return (R_F), which is defined as the market risk premium (R_M - R_F), is proportionately adjusted based upon the stock's beta. Lastly, the investor required rate of return (K) is determined by adding the expected risk-free rate of return to the stock-specific risk premium.

Much like other analytical models including the DCF model, the CAPM is premised upon strict underlying assumptions, which are not always observed in reality.[35] Nonetheless, the model still possesses useful explanatory and predictive abilities, as it has been consistently demonstrated that beta is both positively and linearly correlated to security returns. At the same time, as I will discuss later in my testimony, empirical studies have also demonstrated that the risk-return relationship indicated by the CAPM, as graphically depicted by the Security Market Line ("SML"), is in reality not as steeply sloped as the model implies. In fact, the empirical evidence has shown that the implied y-axis intercept of the SML is actually higher, while the slope of the SML is actually flatter than what is predicted by the traditional CAPM. The implication of these findings is that cost of equity estimates derived from the traditional CAPM will tend to underestimate the investor-required rate of return for lower beta stocks, including utility stocks, absent an adjustment to the traditional model.

Q. Is the CAPM commonly used to estimate the cost of equity, and does it influence the return expectations of investors?

A. Yes, the CAPM is a widely-referenced method for estimating the cost of equity among investment professionals, academics, and corporate finance departments and, therefore, influences the return expectations of investors. According to the *Duff & Phelps Valuation Handbook*:

[35] The strict assumptions underlying the CAPM include: (i) security markets are highly efficient and consistently reflect the true value of a given security; (ii) investors will always pursue their own best economic self-interest, including the maximization of profit and end-of-period wealth; (iii) all investors have the same rate of return expectations; (iv) all investors hold diversified investment portfolios; and (v) investors are not subject to taxes, transaction costs, short-selling restrictions or borrowing restrictions.

> The CAPM has served as the foundation for pricing risk for nearly fifty years. Financial theorists generally have favored using the CAPM as the preferred method to estimate the cost of equity capital and the CAPM has become the most widely used method for estimating the cost of equity capital.[36]

Further evidence of the CAPM's popularity as a cost of equity analytical model is found in *Corporate Finance: A Focused Approach,* where Ehrhardt and Brigham state:

> Recent surveys found that the CAPM approach is by far the most widely used method. Although most firms use more than one method, almost 74% of respondents in one survey, and 85% in the other, used the CAPM.[37]

Considering the widespread acceptance of the CAPM in both investment management and academic settings, there can be no doubt that the CAPM exerts significant influence over the return expectations of investors.

Q. What general approach did you take in applying the CAPM to estimate the cost of equity for PSNH's electric utility operations?

A. As further detailed in Attachment ES-VVR-7, my CAPM analyses considered multiple variants of the CAPM and evaluated both historical and prospective measures of the expected market rate of return and market risk premium.

[36] *2016 Valuation Yearbook* (Duff & Phelps, John Wiley & Sons) at 2-11.

[37] Michael Ehrhardt and Eugene Brigham, *Corporate Finance: A Focused Approach*, (South-Western Cengage Learning, 2008) at 303.

Q. What approach did you take in estimating the prospective risk-free rate of return expectations of investors?

A. When discussing appropriate proxies for the risk-free rate of return in *Modern Regulatory Finance*, a widely-referenced authoritative guide on utility cost of capital matters, Morin observes:

> ….investors price securities on the basis of long-term expectations, including interest rates. Cost of capital models are prospective (i.e., forward-looking) in nature and must take into account current market expectations for the future because investors price securities on the basis of long-term expectations, including interest rates. As a result, in order to produce a meaningful estimate of investors' required rate of return, the CAPM must be applied using data that reflects the expectations of actual investors in the market. While investors examine history as a guide to the future, it is the expectations of future events that influence security values and the cost of capital.
> ….
> The empirical evidence demonstrates that stock prices do indeed reflect prospective financial input data. Moreover, forecasted interest rates are more relevant than current spot rates since in a regulatory setting rates are being set for the future. In the same way that one relies on forecast growth rates in DCF analyses as we shall see in subsequent chapters, one should rely on interest rate forecasts as proxies for the risk-free rate in the CAPM analysis[38]

Indeed, considering that since the time of the 2008-09 financial crisis, the interest rate environment in the U.S. has been heavily influenced by the Federal Reserve's unprecedented monetary policy interventions[39], the importance of expectational inputs (i.e., interest rate forecasts) is more evident than ever. This has recently become more apparent in view of the recent marked increase in U.S. interest rates during 2022 and 2023,

[38] Roger A. Morin, *Modern Regulatory Finance* (PUR Books LLC, 2021) at 171-172.

[39] As has been widely-reported by the financial media in recent years, the Federal Reserve's unprecedented monetary policy interventions, including its quantitative easing programs, were intentionally designed to put downward pressure on long-term interest rates in order to provide a further stimulus to U.S. economic activity.

over which time the U.S. inflation rate reached its highest level in the past 40-plus years. Meanwhile, in an effort to rein-in the multi-decade high U.S. inflation rate, the Federal Reserve Board has raised the Federal Funds target rate on eleven occasions since March 2022 (from 0.00%-0.25% to 5.25%-5.50%), and also continues to gradually liquidate its security holdings that were acquired under its quantitative easing initiatives.

Furthermore, the use of interest rate forecasts appropriately synchronizes the time horizon of the expected risk-free rate of return with the prospective market return I have employed within my analysis. Therefore, as a proxy for the risk-free rate of return, I have evaluated short-to-intermediate term forecasts of the 30-year U.S. Treasury Bond yield from the Blue Chip Financial Forecasts, a highly reputable source of interest rate forecasts. In selecting the appropriate "risk-free" security to evaluate, it should be noted that despite the credit rating downgrades (from AAA to AA+) that have been implemented by Fitch Ratings (2023) and Standard & Poor's (2011) for the long-term sovereign debt rating of the United States, U.S. Treasury securities remain the closest investment vehicle to a risk-free financial asset. This is largely due to the U.S. government's taxing authority and ability to create new currency. From a duration or tenor standpoint, 30-year Treasury Bonds most closely parallel the investment characteristics of common stock, since both are considered long-term, if not permanent, capital. Furthermore, in the absence of market anomalies, 30-year Treasury yields, like common stocks, reflect the long-term inflation expectations of investors, and are subject to less volatility than shorter-dated Treasury securities. Based upon an evaluation of interest rate forecasts available from the Blue Chip Financial

Forecasts, and as reflected in Attachment ES-VVR-7, I have concluded that a reasonable proxy for the prospective risk-free rate of return is 4.21 percent.

Q. In structuring your CAPM analysis, what approach did you take in estimating the market risk premium expectations of investors?

A. To ensure a thorough and comprehensive evaluation of the risk premium expectations of investors, I have completed market risk premium analyses on both a prospective basis and on a historical basis. With regard to my prospective analysis, I have evaluated forward-looking indicators of the market return expectations of investors, along with time-horizon matched forecasts of the risk-free rate of return. As for my historical analysis, I have relied upon the historical returns data reported by the Kroll *Cost of Capital Navigator* for the 98-year period between 1926 and 2023.

Q. What approach did you take in estimating the prospective market return expectations of investors?

A. To estimate the prospective market return expectations of investors, or "R_M," I have completed forward-looking DCF analyses for both the S&P 500 Index and the Value Line 1,700 stock universe. The results of these DCF analyses, which have been consistently applied to the Electric Group, Gas LDC Group and Non-Regulated Group, are presented on page 1 of Attachment ES-VVR-7. These results are also summarized as follows:

DCF Estimate of Market Return for the S&P 500 Index

1.62% (D/P) + 10.29% (g) = 11.91% (K) or (R_M)

Where: D/P = expected dividend yield over the next 12 months;

g = long-term earnings growth rate estimate;

R_M = expected return of the market portfolio.

The DCF results for the Value Line 1,700 stock universe are summarized as follows:

DCF Estimate of Market Return for the Value Line 1,700 Stock Universe

2.20% (D/P) + 7.94% (g) = 10.14% (K) or (R_M)

Based upon the results of the above DCF analyses for the S&P 500 Index and the Value Line 1,700 stock universe, a 11.03 percent ((11.91%+10.14%)/2=11.03%) prospective market rate of return is indicated, which I have applied to each of the respective proxy groups. Based upon a prospective market return of 11.03 percent and a prospective risk-free rate of return assumption of 4.21 percent, a prospective market risk premium of 6.82% is indicated.

Q. What average historical market risk premium is indicated by your analysis?

A. Based upon the historical returns data reported by the Kroll *Cost of Capital Navigator* for the 98-year period between 1926-2023, a 7.17 percent historical market risk premium is indicated.

Q. Based upon your informed judgment, what level of market risk premium have you applied to your CAPM analysis?

A. As previously noted, to ensure a thorough and comprehensive evaluation of the risk premium expectations of investors, I have conducted market risk premium analyses on both

a prospective basis and a historical basis. Therefore, by using the historical average risk premium reported by the Kroll *Cost of Capital Navigator* in combination with the prospectively determined risk premium discussed above, I have taken a balanced approach in estimating the risk premium expectations of investors. Accordingly, the expected market risk premium indicated by my analysis is 7.00 percent ((6.82% + 7.17%)/2 = 7.00%).

Q. How did you derive the beta values employed within your CAPM analysis?

A. In determining the appropriate betas to use for each of the proxy groups, I evaluated the betas reported by the Value Line Investment Survey, a widely-referenced source of beta values in utility regulatory proceedings. As illustrated in Table 11 below, the average Value Line betas for the Electric Group, Gas LDC Group and the Non-Regulated Group are 0.91, 0.88, and 0.90, respectively.

Table 11
Beta Coefficients by Proxy Group

Beta Value	Electric Group	Gas LDC Group	Non-Regulated Group
Value Line Beta	0.91	0.88	0.90

Q. When applying the CAPM, what variants of the CAPM should be applied to fully reflect the return expectations of investors?

A. Multiple academic studies have advocated the use of a size-premium adjustment to the traditional CAPM.[40] These studies have revealed that small capitalization stocks have historically earned returns that are materially higher than the returns predicted by the CAPM. Indeed, the empirical research strongly suggests that beta, or systematic risk alone, does not fully explain the higher relative returns earned by small capitalization stocks. The *2023 SBBI Yearbook* explains the size phenomenon as follows:

> One of the most remarkable discoveries of modern finance is the finding of a relationship between company size and return, generally referred to as the "size effect". The size effect is based on the empirical observation that companies of smaller size tend to have higher returns than do larger companies.
> ….
> The company size phenomenon is remarkable in several ways. First, the greater risk of small-cap stocks does not, in the context of the capital asset pricing model, fully account for their higher returns over the long term. In the capital asset pricing model (CAPM) only systematic, or beta risk, is rewarded; small-cap stock returns have exceeded those implied by their betas.
> ….
> The increased risk faced by investors in small stocks is quite real[41].

Therefore, to correct for the inherent deficiencies of the CAPM relative to smaller capitalization stocks, the Kroll *Cost of Capital Navigator* reports size premiums which can be used in conjunction with the CAPM to more accurately estimate the return expectations

[40] *See* Michael Annin, "Equity and the Small-Stock Effect," *Public Utilities Fortnightly,* October 15, 1995, 42-43; and, Eugene F. Fama and Kenneth R. French, "The Cross-Section of Expected Stock Returns," *The Journal of Finance*, 48 (June 1992), at 427-465.

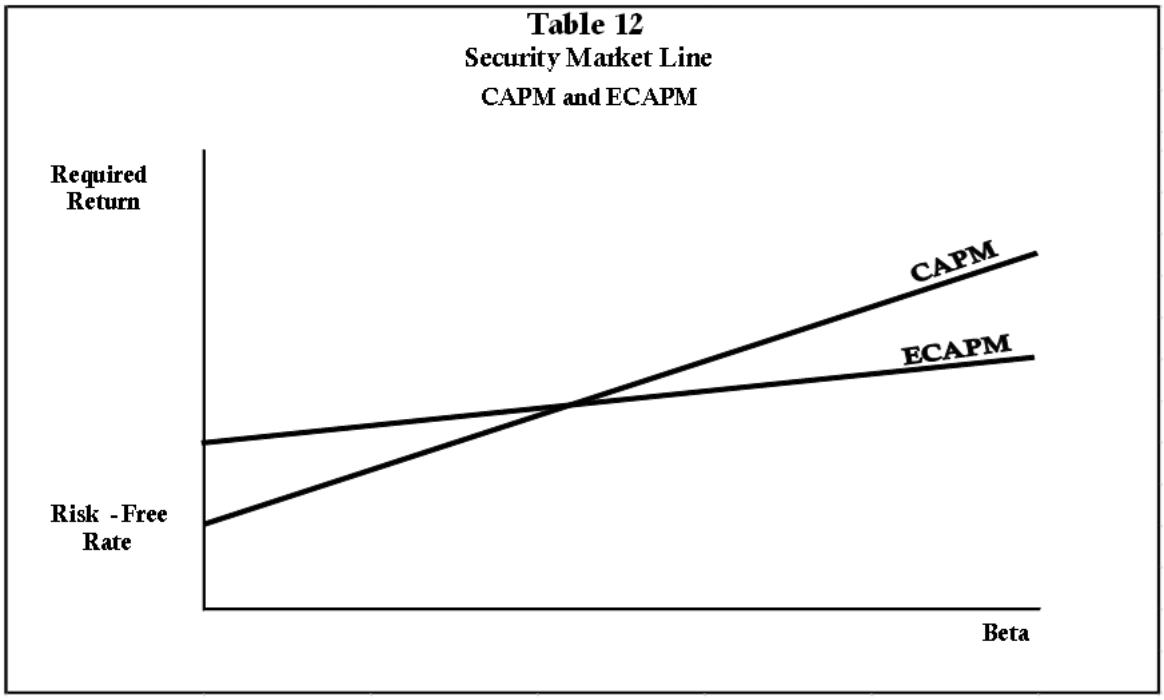
[41] *2023 SBBI Yearbook*, (Kroll LLC), at 143, 145 and 147.

of investors relative to small and mid-capitalization stocks. As reflected in the *Cost of Capital Navigator,* based upon an average market capitalization of $14.3 billion, the Electric Group would be classified as a Decile 3 portfolio and assigned a size premium of 0.61 percent. Based on an average market capitalization of $6.7 billion, the Gas LDC Group would be classified as a Decile 4 portfolio, and assigned an average size premium of 0.64 percent. Lastly, based upon an average market capitalization of $123.0 billion, the Non-Regulated Group would be classified as a large-cap, Decile 1 Portfolio, and assigned a size premium of *negative* -0.06 percent. In the absence of these size premium adjustments, the results indicated by the traditional CAPM for the Electric Group and the Gas LDC Group would *understate* the return expectations of investors, while with respect to the Non-Regulated Group, the traditional CAPM would have the tendency to *overstate* the return expectations of investors.

Q. Have you considered any other variants of the CAPM?

A. Yes. I have also considered the ECAPM within my evaluation. The ECAPM model is based upon extensive empirical evidence that the risk-return relationship between beta and stock returns, as graphically depicted by the Security Market Line reflected in Table 12 below, is actually flatter than what is predicted by the traditional CAPM.

Table 12
Security Market Line
CAPM and ECAPM



In a 1989 empirical study conducted by Morin, a simplified version of the ECAPM was derived and is expressed as follows:[42]

$$K = R_F + 0.25\ (R_M - R_F) + 0.75\ \beta(R_M - R_F)$$

In essence, the ECAPM places a 25 percent weighting on the overall market risk premium and a 75 percent weighting on the company specific, beta-adjusted risk premium. The use of similar forms of the ECAPM has been recognized by state public service commissions, including the Montana Public Service Commission, New York Public Service Commission and the Regulatory Commission of Alaska. The results of my ECAPM analysis for the Electric Group, Gas LDC Group and Non-Regulated Group are presented within pages 2,

[42] Roger A. Morin, *Modern Regulatory Finance* (PUR Books LLC, 2021), at 220-222.

3 and 4 of Attachment ES-VVR-7, respectively, and are also summarized in Table 13 below.

Q. What were the results of your application of the CAPM, including the variants of the model you evaluated?

A. The results of my CAPM analyses are presented in Attachment ES-VVR-7 and are also summarized in Table 13 below. Considering that substantial empirical evidence supports the use of both the CAPM with size adjustments and the ECAPM, I have incorporated all three model variants into my evaluation, including the traditional CAPM, in determining the CAPM-indicated cost of equity for each of the respective proxy groups.

Table 13
CAPM Results by Model Variant

Model Variant	Electric Group	Gas LDC Group	Non-Regulated Group
Traditional CAPM	10.57%	10.37%	10.50%
+ Flotation cost adj.	0.10%	0.10%	0.11%
Traditional CAPM	**10.67%**	**10.47%**	**10.61%**
Trad. CAPM (w/ size adj.)	11.18%	11.01%	10.44%
+ Flotation cost adj.	0.10%	0.10%	0.11%
Trad. CAPM (w/size adj.)	**11.28%**	**11.11%**	**10.55%**
Empirical CAPM	10.73%	10.58%	10.68%
+ Flotation cost adj.	0.10%	0.10%	0.11%
Empirical CAPM	**10.83%**	**10.68%**	**10.79%**

These results, which incorporate the appropriate flotation cost adjustments, indicate a CAPM-derived cost of equity having a central tendency of approximately 10.90 percent for the Electric Group, 10.75 percent for the Gas LDC Group and 10.65 percent the Non-Regulated Group.

D. Risk Premium Method (RPM) Analysis

Q. Please provide an overview of the RPM and the theoretical basis for using it to estimate a utility's cost of equity.

A. The RPM is based upon the fundamental premise that a company's cost of common equity is greater than its prospective cost of debt, due to the additional risks associated with investing in common stocks. The most important of these risks is residual claim risk, which arises due to the subordinated position of common stockholders relative to both bondholders and preferred stockholders. In essence, common shareholders stand "last in line" with respect to the distribution of a company's earnings since common stock dividends are paid only after contractually required debt service payments and discretionary preferred dividend payments have been made. The same priority of claims also applies to asset-sale proceeds in the event of a bankruptcy liquidation scenario, where common shareholders typically only recover a small fraction, if any, of their original investment. As compensation for bearing these additional risks, common stock investors demand an equity risk premium over and above a company's cost of debt. Considering that the equity risk premium is a forward-looking concept, it must be estimated on the basis of investor expectations and cannot be directly observed. Once the expected risk premium has been estimated, it can be added to the company's prospective cost of debt to estimate the cost of common equity, as follows:

$$K = C_D + P_R \quad \text{(Equation 1.6)}$$

Where:

K = expected cost of common equity;

C_D = company's prospective cost of debt;

P_R = expected equity risk premium.

Q. Is the RPM commonly used to estimate the cost of equity and does it influence the return expectations of investors?

A. Yes, the RPM is a widely-referenced cost of equity model among investors, analysts and academics, and therefore influences investor return expectations. Evidence of the popularity of the RPM is found in *Corporate Finance: A Focused Approach*, where Ehrhardt and Brigham state that *"*three methods typically are used*"* in estimating the cost of common equity, one of which is the RPM.[43]

Q. How did you approach your RPM analysis?

A. In applying the RPM to the three respective proxy groups, I employed a virtually identical approach, as only a few minor adjustments were required for the Non-Regulated Group. In essence, my approach involved estimating the prospective long-term bond yields (C_D) for each of the proxy groups based upon their average credit ratings, and then estimating the appropriate equity risk premium (P_R) for each of the three groups. Once these two components were derived for each of the proxy groups, they were simply added together to arrive at the RPM-indicated cost of equity. My comprehensive RPM analysis is presented within Attachment ES-VVR-8. Summary results for the Electric Group, Gas

[43] M. Ehrhardt and E. Brigham, *Corporate Finance: A Focused Approach* (South-Western Cengage Learning, 2008), at 294.

LDC Group and Non-Regulated Group are presented on pages 1, 7 and 9 of Attachment ES-VVR-8, respectively. A detailed discussion of the RPM results for the Electric Group is presented herein. Quantitative results for the Gas LDC Group and Non-Regulated Group are presented within pages 7-10 of Attachment ES-VVR-8.

Q. How did you derive the 5.81 percent prospective bond yield for the Electric Group?

A. The bond yields referenced in the RPM must appropriately reflect the forward-looking return expectations of investors. Therefore, in determining the "C_D" component of the RPM equation, I have employed a forward-looking long-term bond yield for the Electric Group based upon the Group's average long-term credit ratings of "BBB+" from S&P, and "Baa1" from Moody's. As reflected on page 1 of Attachment ES-VVR-8, this was accomplished by first evaluating forecasted bond yields for Aaa rated corporate bonds, and then making the necessary credit spread adjustments to reflect the higher level of default risk associated with BBB+ / Baa1 rated utility bonds.

As reflected on pages 1 and 2 of Attachment ES-VVR-8, the Blue Chip Financial Forecasts consensus forecast for Aaa corporate bond yields is 4.95 percent for the 2024-2028 period. An upward adjustment of 0.67 percent was required to reflect the credit spread differential between Aaa rated corporate bonds and A rated utility bonds, both of which reflect Moody's generic ratings categories. A further upward adjustment of 0.20 percent was also required to reflect the credit spread differential between the generic rating category of "A" and the more precise "BBB+" rating from S&P and "Baa1" rating from Moody's. Additional information supporting both of these credit spread adjustments can be found

within pages 1 and 3 of Attachment ES-VVR-8. The prospective bond yield for the Electric Group was derived by adding both of the aforementioned credit spread adjustments to the prospective Aaa corporate bond yield, which resulted in a 5.81 percent prospective bond yield.[44]

Q. What general approach have you taken in estimating the expected equity risk premium for the Electric Group?

A. Consistent with established practices, I have conducted equity risk premium analyses using both the total market approach and the public utility index approach. The total market approach is considered an "indirect" approach, since an equity risk premium is initially estimated for the overall market portfolio and is subsequently adjusted to reflect the specific risk profile of the applicable proxy group. Within the framework of the total market approach, I have conducted separate risk premium analyses on both a historical basis and a prospective basis, as reflected on page 4 of Attachment ES-VVR-8. In contrast, the public utility index approach is considered a "direct" approach, since the expected equity risk premium is estimated by comparing average historical holding period returns for the S&P 500 Utility Index to historical yields on long-term public utility bonds, without the need for any further risk adjustments. The results of my public utility index approach analysis are presented on page 5 of Attachment ES-VVR-8.

[44] Subject to rounding differences.

Q. In applying the total market approach to the Electric Group, how did you arrive at the indicated equity risk premium of 5.45 percent?

A. As previously mentioned, in applying the total market approach, I conducted both historical and prospective risk premium analyses, each of which brings different strengths and perspectives into the evaluation process.

Historical Risk Premium Analysis

To facilitate a historical risk premium analysis under the total market approach, I have relied upon the historical holding period returns information published by the *SBBI Yearbook* for both large company stocks (S&P 500 Index) and for high-grade, long-term corporate bonds. When the average historical risk premium is used as a proxy for the prospective risk premium, its predictive value is enhanced when the longest possible historical period is evaluated. Accordingly, I have utilized the average historical holding period returns for the entire 97-year period for which data is available from the *2023 SBBI Yearbook*. The arbitrary use of shorter time periods would subject the risk premium analysis to greater potential volatility from short-term market trends and/or aberrations, which would not reflect the long-term expectations of investors. Moreover, use of the longest possible historical period for which data is available will incorporate a greater number of business and interest rate cycles into the analysis, further enhancing its predictive value. Indeed, Morin provides support for this approach in *Modern Regulatory Finance* where he maintains:

> To estimate the MRP, one should rely on returns realized over long time periods rather than returns realized over more recent time periods because realized returns can be substantially different from prospective returns anticipated by investors, especially when measured over short time periods.

> But over very long periods, investor expectations coincide with realizations; otherwise, investors would never invest any money. A risk premium study should consider the longest possible period for which data are available. Short-run periods during which investors earned a lower risk premium than they expected are offset by short-run periods during which investors earned a higher risk premium than they expected. Moreover, the use of the entire study period in estimating the appropriate market risk premium minimizes subjective judgment and encompasses many diverse regimes of inflation, interest rate cycles, and economic cycles. There is no compelling reason to weigh recent returns more heavily than distant returns because of the random behavior of the market risk premium.
>
> ….Clearly, the accuracy of the realized risk premium as an estimator of the prospective risk premium is enhanced by increasing the number of years used to estimate it in the same way that one can predict with a good deal of confidence that approximately 50 heads will appear in 100 tosses of a coin.[45]

Therefore, based upon the *SBBI Yearbook* holding period returns for the entire historical period for which data is available, a 5.90 percent historical equity risk premium is indicated using the total market approach. As shown on page 4 of Attachment ES-VVR-8, this result is based upon the arithmetic average annual return of 12.00 percent for large company stocks (S&P 500 Index), and the arithmetic average annual return of 6.10 percent for high-grade, long-term corporate bonds. Use of the arithmetic average risk premium is appropriate since it best reflects the forward-looking risk premium expectations of investors and the potential variability of expected returns. In contrast, the geometric mean is more suitable for reporting past investment performance, since it reflects a consistently compounded or "smoothed" rate of growth over a given historical period.

[45] Roger A. Morin *Modern Regulatory Finance* (PUR Books LLC, 2021), at 180.

Further support for using the arithmetic average equity risk premium is also found in the *2023 SBBI Yearbook*, a widely-cited investment guide, which states the following:

> The equity risk premium data presented in this book are arithmetic average risk premiums as opposed to geometric average risk premiums. The arithmetic average equity risk premium can be demonstrated to be most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building-block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because both the CAPM and the building-block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance because it represents the compound average return.[46]

Prospective Risk Premium Analysis

A prospective risk premium analysis is also required to fully capture the forward-looking return expectations of investors. Indeed, it is often maintained that prospective risk premiums bear the greatest relevance to the cost of equity estimation process, since they incorporate both historical trends and changes expected to occur in the future. To facilitate a prospective risk premium analysis using the total market approach, it was necessary to estimate both the prospective market return expectations of investors and the prospective corporate bond yield on a time horizon matched basis. As previously referenced in the CAPM section of my testimony, and as illustrated on page 1 of Attachment ES-VVR-7, I have estimated the prospective market return expectations of investors by completing DCF

[46] *2023 SBBI Yearbook* (Kroll, LLC), at 193.

analyses for both the S&P 500 Index and the Value Line 1,700 stock universe. The results of these analyses are as follows:

DCF Estimate of Market Return for the S&P 500 Index

1.62% (D/P) + 10.29% (g) = 11.91% (K) or (R_M)

DCF Estimate of Market Return for the Value Line 1,700 Stock Universe

2.20% (D/P) + 7.94% (g) = 10.14% (K) or (R_M)

Based upon these DCF results, a 11.03 percent ((11.91%+10.14%)/2=11.03%) prospective market return is indicated. As a proxy for the prospective corporate bond yield, I have relied upon the Blue Chip consensus forecast for Aaa rated corporate bonds, which indicates a 4.95 percent average yield for the 2024-2028 period, as further illustrated on pages 1 and 2 of Attachment ES-VVR-8. Based upon these values, and as reflected on page 4 of Attachment ES-VVR-8, a 6.09 percent prospective equity risk premium is indicated (11.03% - 4.95% = 6.09%).

Total Market Equity Risk Premium and Risk Adjustment

To ensure a balanced approach in assessing the risk premium expectations of investors, I have placed equal emphasis on the historical risk premium and prospective risk premium results indicated above. Using this balanced approach, a 5.99 percent total market risk premium is indicated ((5.90%+6.09%)/2=5.99%).[47] Considering that this result must be

[47] Subject to rounding differences.

adjusted to recognize the risk differential between the overall market index and the Electric Group, I have applied an average beta value of 0.91 to the indicated market risk premium to derive a risk premium which is applicable to the Electric Group. Therefore, as reflected on page 4 of Attachment ES-VVR-8, the indicated equity risk premium for the Electric Group under the Total Market Approach was determined to be 5.45 percent (5.99% x 0.91 = 5.45%).

Q. In applying the public utility index approach to the Electric Group, how did you arrive at the indicated equity risk premium of 4.57 percent?

A. The results of my public utility index approach analysis are presented on page 5 of Attachment ES-VVR-8. As a proxy for the total return expectations of investors relative to utility stocks, I have evaluated both the average historical holding period returns for the S&P 500 Utilities Index, as well as the currently-implied equity risk premium for the same index. As reflected in Attachment ES-VVR-8, with regard to the average historical holding period returns, the average annual total return for the S&P 500 Utilities Index is 10.62 percent. During this same period, the average annual yield for long-term utility bonds bearing an "A" rating from Moody's was 6.23 percent. Historical yields on "A" rated utility bonds were selected for evaluation since "A" rated bonds represent the mid-point credit rating among the historical utility bond yields that have been reported by Moody's and Mergent (historical yields on three credit ratings have been reported: "Aa," "A" and "Baa"). A detailed breakdown of these historical returns is presented on page 6 of

Attachment ES-VVR-8. Based upon the foregoing historical returns, a 4.40 percent equity risk premium is indicated for the Electric Group (10.62% - 6.23% = 4.40%).[48]

As further detailed in the bottom section of page 5 of Attachment ES-VVR-8, I have also evaluated the currently-implied equity risk premium in the prevailing market environment, by conducting an analysis of the expected equity return for the S&P Utilities Index, which yielded an expected return of 10.52 percent. I then compared the recent yields on "A" rated utility bonds (5.77 percent) to the expected equity return, which yielded a currently-implied equity risk premium of 4.75 percent (10.52%-5.77%=4.75%). Lastly, to ensure a balanced estimate of the equity risk premium under the Public Utility Index Approach, I referenced the average of the equity risk premium estimates derived under the historical approach and the currently-implied approach, which yielded an indicated equity risk premium of 4.57 percent ((4.40% +4.75%)/2 = 4.57%).[49]

Q. Based upon your RPM analysis using both the total market approach and the public utility index approach, what level of equity risk premium and cost of equity are indicated for the Electric Group?

A. To ensure a balanced analysis, I have placed equal emphasis on the total market approach and the public utility index approach and have concluded that 5.01 percent is a reasonable estimate of the investor-expected equity risk premium for the Electric Group. Based upon an expected risk premium of 5.01 percent, and a 5.81 percent prospective long-term bond yield for the Electric Group, I have also concluded that the unadjusted RPM-indicated cost

[48] Subject to rounding differences.

[49] Id.

of equity for the Electric Group is 10.83 percent (5.01%+5.81%=10.83%)[50]. Consistent with the other market-based analytical models, to this result I added the required flotation cost adjustment of 0.10 percent, which yielded an adjusted RPM-indicated cost of equity of 10.93 percent for the Electric Group.

Q. Under the RPM, what cost of equity was indicated for the Gas LDC Group and the Non-Regulated Group?

A. As reflected on page 7 of Attachment ES-VVR-8, the unadjusted RPM-indicated cost of equity for the Gas LDC Group was determined to be 10.64 percent. Consistent with the other market-based analytical models, I added the required 0.10 percent flotation cost adjustment to this result, which yielded an adjusted RPM-indicated cost of equity of 10.74 percent for the Gas LDC Utility Group.

Lastly, as reflected on page 9 of Attachment ES-VVR-8, the unadjusted RPM-indicated cost of equity for the Non-Regulated Group was determined to be 11.00 percent. Consistent with the other market-based analytical models that I evaluated for the Non-Regulated Group, I added the required 0.11 percent flotation cost adjustment to this result, which yielded an adjusted RPM-indicated cost of equity of 11.11 percent for the Non-Regulated Group.

[50] Id.

The results of my RPM evaluation are summarized in Table 14 below.

Table 14
Risk Premium Method Results

Model Variant	Electric Group	Gas LDC Group	Non-Regulated Group
Risk Premium Method	10.83%	10.64%	11.00%
+ Flotation cost adjust.	0.10%	0.10%	0.11%
Risk Premium Method	10.93%	10.74%	11.11%

X. CAPITAL STRUCTURE

Q. What is PSNH's proposed capital structure in this proceeding?

A. PSNH is proposing a five-quarter average capital structure as of the December 31, 2023 test year-end, which includes a proforma adjustment to remove short-term debt from the Company's capital structure, which PSNH expects to refinance with a long-term debt issuance in the amount of $300 million during 2024. This approach is consistent with established precedent in New Hampshire, as utilities are generally permitted to incorporate known and measurable changes that are expected to occur after the test year-end into their rate filings, including those changes impacting the Company's capital structure. On this basis, the Company has proposed a rate-setting capital structure in this proceeding consisting of 53.85 percent common equity and 46.15 percent long-term debt. The Permanent Rate Revenue-Requirement Analysis Testimony addresses the Company's proposed capital structure in greater detail in their joint direct testimony.

Q. Have you conducted an evaluation to determine if the Company's proposed capital structure in this proceeding is reasonable?

A. Yes. As reflected in Table 15 below, I have evaluated the reasonableness of PSNH's proposed capital structure by comparing it to the capital structure ratios of the utility operating subsidiaries of the Electric Group companies. To ensure a consistent analysis across the respective regulatory jurisdictions, I conducted this analysis on the basis of permanent capitalization, which excludes short-term debt.

Table 15
Capital Structure Ratios of the Utility Operating Subsidiaries of the Electric Group[51] Based on Permanent Capitalization

Utility Operating Company	Parent	Common Equity Ratio	Preferred Stock Ratio	Long-Term Debt Ratio
Minnesota Power Enterprises, Inc.	ALE	62.4%	-	37.6%
Superior Water, Light & Power	ALE	61.0%	-	39.0%
Interstate Power and Light Co.	LNT	49.7%	-	50.3%
Wisconsin Power and Light Co.	LNT	54.8%	-	45.2%
Alaska Electric Light & Power Co.	AVA	62.0%	-	38.0%
Avista Corp. (Idaho)	AVA	50.0%	-	50.0%
Avista Corp. (Washington)	AVA	48.5%	-	51.5%
Consumers Energy Company	CMS	50.2%	0.2%	49.6%
Consolidated Edison of New York	ED	49.2%	-	50.8%
Orange and Rockland Utilities	ED	49.6%	-	50.4%
Idaho Power Company	IDA	49.4%	-	50.6%
Northwestern Energy Group	NWE	49.9%	-	50.1%
Northwestern Energy (Montana)	NWE	48.0%	-	52.0%
Oklahoma Gas and Electric Co.	OGE	53.3%	-	46.7%
Portland General Electric Co.	POR	50.0%	-	50.0%
Oncor Electric Delivery Holdings	SRE	52.6%	-	47.4%
San Diego Gas & Electric Co.	SRE	52.6%	-	47.4%
Wisconsin Electric Power Co.	WEC	60.5%	0.4%	39.1%

[51] Source: S&P Global Market Intelligence (accessed April 18, 2024). Data provided from the latest available regulated utility balance sheets and/or most recent rate case outcomes.

Upper Mich. Energy Res. Corp	WEC	53.9%	-	46.1%
Wisconsin Public Service Corp.	WEC	56.5%	-	43.5%
Utility Operating Co. - Maximum	-	62.4%	0.4%	52.0%
Utility Operating Co. - Minimum	-	48.0%	-	37.6%
Utility Operating Co. - Average	-	53.2%	-	46.8%
PSNH Capital Structure	-	53.85%	-	46.15%

Q. What conclusions have you arrived at regarding the appropriateness of the Company's proposed capital structure in this proceeding?

A. After reviewing the data contained in Table 15 above, I have determined that the common equity capitalization ratios for the operating subsidiaries of the Electric Group range from 48.0 percent to 62.4 percent, and reflect an average common equity ratio of 53.2 percent. Based upon this data, I have concluded that the Company's proposed common equity ratio of 53.85 percent is well-within the range of what is typical and customary for electric utility operating companies, and is also closely comparable to the 53.2 percent average common equity ratio for the operating subsidiaries of the Electric Group. Based upon these findings, I have concluded that the Company's proposed capital structure is reasonable for purposes of the instant proceeding.

XI. CONCLUSIONS AND RECOMMENDATIONS

Q. Can you please summarize the results of the various cost of equity analytical models that you evaluated, as well as your proposed ROE recommendation in this proceeding?

A. Yes. I present Table 2, Table 3 and Table 4 below, which were also presented earlier in my testimony, and which summarize the results of my cost of equity evaluation and ROE recommendations.

Table 2 Indicated Cost of Equity for the Proxy Groups			
Method/Model	**Electric Group**	**Gas LDC Group**	**Non-Regulated Group**
DCF Method	10.79%	10.44%	10.90%
Traditional CAPM	10.67%	10.47%	10.61%
CAPM (w/size adj.)	11.28%	11.11%	10.55%
ECAPM	10.83%	10.68%	10.79%
Risk Premium Method	10.93%	10.74%	11.11%

Considering that this proceeding relates to PSNH's electric distribution operations, I have placed primary emphasis on the analytical model results yielded for the Electric Group in forming my overall cost of equity recommendations. As reflected in Table 3 below, an analysis of the above results for the Electric Group yielded the following measures of central tendency for each of the analytical methods employed.

Table 3 Cost of Equity Estimates Measures of Central Tendency Electric Group	
Median DCF Result	10.79%
Average DCF Result	10.79%
Median CAPM Result	10.83%
Average CAPM Result	10.93%
Median RPM Result	10.93%
Average RPM Result	10.93%

It is further instructive to evaluate a broader array of cost of equity estimates developed by referencing complementary proxy groups, such as the Gas LDC Group and the Non-

Regulated Group. Therefore, as reflected in Table 4 below, I have also presented the composite results for all three of the proxy groups I evaluated, which yielded the following measures of central tendency for each of the analytical methods employed.

Table 4 Cost of Equity Estimates Measures of Central Tendency Composite – All Three Proxy Groups	
Median DCF Result	10.79%
Average DCF Result	10.71%
Median CAPM Result	10.68%
Average CAPM Result	10.78%
Median RPM Result	10.93%
Average RPM Result	10.93%

Based upon these measures of central tendency, I have concluded that the cost of common equity for PSNH's electric utility operations is in the range of 10.30 to 11.30 percent, and that a point estimate at the midpoint of this range, or 10.80 percent, is the appropriate cost of equity to apply in the instant proceeding. However, as noted earlier, the Company has elected to propose a cost of equity in this proceeding of 10.30 percent, which falls at the lower-end of the range of reasonableness indicated by my quantitative and qualitative evaluations. As noted earlier, in my judgment, considering that long-term capital costs have increased significantly in recent years, and particularly since the time of PSNH's 2019 base rate proceeding (Docket No. DE 19-057), the Company's proposed ROE in this

proceeding represents a conservative estimate of its cost of equity in the current capital markets environment.

Q. Does this conclude your prepared direct testimony?

A. Yes, it does.

XII. APPENDICES

Appendix A - DCF Analysis - Detailed Discussion

1. Determination of the Dividend Yield Component

Since the DCF model recognizes that investors value securities on the basis of prospective cash flows, it is essential that the analyst determine the amount of dividend payments (D_1) which are expected to be received over the next twelve months. Utilizing the current dividend amount (D_0) would not be appropriate under DCF principles, since current dividends are not forward-looking and could potentially underestimate the cost of equity. For this reason, estimates of dividends to be paid over the next twelve months by each company comprising the Electric Group, Gas LDC Group, and Non-Regulated Group were obtained from the Value Line Summary and Index, and serve as the expected dividend payment (D_1) within these respective DCF analyses.

In selecting the appropriate stock price (P_0) to utilize in calculating the dividend yield, it is important to remember that under the iterative market valuation process, price equilibrium only occurs when investors have realized their expected rate of return, or "K." In other words, the current stock price (P_0) has embedded within it the current forward-looking return expectations of investors, although the latter cannot be directly observed. Therefore, to properly estimate the expected cost of equity, it is essential that the current stock price (P_0) be used when calculating the dividend yield component, since the "P" and "K" components of the model are simultaneously determined upon reaching equilibrium, and thus have a time dependency on one another.

Consistent with the semi-strong version of the Efficient Market Hypothesis, use of the current stock price is appropriate, since it incorporates all relevant publicly-available information and thus captures the current forward-looking growth expectations of investors.

In contrast, using an average of stock prices over some historical period, such as six to twelve months, would reflect outdated market information and investor growth expectations, which would not be representative of current market conditions. Therefore, such an approach would be inconsistent with the core tenets of the Efficient Market Hypothesis. Moreover, using past averages of stock prices would also create a time period mismatch among the components of the DCF model, since the dividend yield component would be based upon past stock prices which reflect previous growth expectations, while the growth component ("g") of the model would reflect the current forward-looking growth expectations of investors.

Notwithstanding these valid arguments, simply referencing the most recent day's closing stock price can present a different challenge in the form of temporary price aberrations, which may be attributable to volatile market conditions, the unanticipated release of company information, or short-term supply and demand imbalances. Therefore, with respect to the companies comprising the Electric Group, Gas LDC Group, and Non-Regulated Group, I have defined the current stock price (P_0) as an average closing stock price that is calculated on the basis of the composite average of the 30-day average, 60-day average and 90-day average stock prices. This approach places the most emphasis on the 30-day average stock price, but also provides some weighting to the 60-day average and 90-day average stock prices. More specifically, this approach places a one-half weighting on the 30-day average stock price, a one-third weighting on the 60-day average stock

price, and a one-sixth weighting on the 90-day average stock price. Taking this approach mitigates the effects of short-term price aberrations for the companies comprising these three proxy groups, while still recognizing the basic tenets of the Efficient Markets Hypothesis.

Finally, to determine the expected dividend yield for the companies comprising the Electric Group, Gas LDC Group, and Non-Regulated Group, the expected dividend (D_1) was simply divided by the current stock price (P_0) as defined above.

2. Growth Component – General Approach

There is no question that discerning the long-term growth expectations of investors is the most difficult and controversial aspect of implementing the DCF constant growth model, as it requires the analyst to get inside the "collective psyche" of a large universe of investors. Considering that the DCF model is technically focused on the growth of dividends into perpetuity, a reliable forecast of sequential dividend payments into the distant future would provide an appropriate indication of investors' long-term growth expectations. However, dividend forecasts for multi-decade periods are simply not available, so to implement the DCF model, the analyst must rely upon other available indicators which are likely to influence the growth expectations of investors. As such, in the initial stages of my DCF analysis, I evaluated a variety of historical and forward-looking growth indicators, each of which could potentially influence investor expectations**.**

Recognizing that historical growth trends can influence the future growth expectations of investors, rate of return analysts often consider historical trends when estimating the growth component of the DCF model. In so doing, the presumption is that investors extrapolate past

growth patterns in forming their future expectations. In my judgment, evaluating historical growth indicators is a reasonable first step in the DCF growth rate evaluation process, particularly for companies with a history of stable performance. Nevertheless, while historical growth trends clearly provide a valuable point of reference, the analyst must guard against placing too much emphasis upon them, as they may no longer reflect the current growth expectations of investors. Indeed, the growth expectations of investors today may be very different from average growth rates realized in the past due to structural changes within the utility industry, changes in operating costs and expected profitability, and/or changes in general economic conditions. Also, it is often argued that historical growth trends are already factored into forward-looking growth projections, including analyst earnings forecasts, and that care should therefore be taken to ensure that historical data is not inadvertently double-counted.

Lastly, when evaluating historical growth trends, the analyst generally finds that the strict assumptions required under constant growth theory have not held true or been maintained, as is often reflected in differing historical growth rates between DPS, EPS and BVPS. Thus, while the analyst implicitly accepts the strict assumptions of the constant growth model on a prospective basis, this is rarely the case in retrospect, which may call into question the usefulness of historical indicators in deriving the constant growth rate assumption.

Considering these multiple shortcomings, historical growth indicators should never be relied upon exclusively and significant emphasis should also be placed on forward-looking growth indicators. Therefore, consistent with accepted practices, I have evaluated both historical and forward-looking growth indicators for several key variables, including EPS, DPS, and BVPS. More specifically,

with regard to historical growth rates, for each member of the Electric Group and Gas LDC Group, I have completed a traditional analysis of the 5-year and 10-year average historical growth rates for EPS, DPS, and BVPS. All 5-year and 10-year historical growth rate information was sourced from the Value Line Investment Survey. The results of my historical growth rate analysis for EPS, DPS and BVPS for the Electric Group and Gas LDC Group are presented on page 5 of Attachment ES-VVR-4 and Attachment ES-VVR-5, respectively.

With regard to projected growth rates, for each member of the Electric Group and Gas LDC Group, I have analyzed forward-looking projections for EPS, DPS, and BVPS. Growth projections for each of these variables were derived from the Value Line Investment Survey, which publishes 3-to-5 year growth rate projections. In addition, EPS consensus estimate growth rates were sourced from Yahoo/Thomson Reuters and Zacks, both of which publish 5-year earnings growth estimates. The results of my projected growth rate analyses for EPS, DPS and BVPS for the Electric Group and Gas LDC Group are presented on pages 1 and 5 of Attachment ES-VVR-4 and Attachment ES-VVR-5, respectively.

With regard to the Non-Regulated Group, I have focused my analysis on projected growth rates for EPS, as well as historical EPS growth rates. Growth projections for EPS were sourced from the Value Line Investment Survey, while EPS consensus estimate growth rates were sourced from Yahoo/Thomson Reuters and Zacks. Historical EPS growth rates were sourced from Value Line. With respect to the Non-Regulated Group, the results of my projected growth rate analyses are presented within page 1 of Attachment ES-VVR-6, while the results of my historical EPS growth rate analysis are presented on page 2 of Attachment ES-VVR-6.

3. Growth Component - Dividend Growth Forecasts vs. Earnings Growth Forecasts

Notwithstanding the fact that the DCF model is conceptually a dividend-based model, in practice there exists a fundamental challenge in attempting to reference dividend forecasts to estimate the growth expectations of investors. Simply stated, dividend forecasts are not widely-referenced by investors, and for this reason, they are only published by a limited number of information service providers. In contrast, earnings growth forecasts are widely-available from a variety of internet-based and print media sources. As I will discuss later, earnings forecasts are widely-referenced by investors and are available to the general public from a variety of sources. It should also be noted that even Williams, who originally developed the long-form and constant growth versions of the DCF model, found "no contradiction" between his DCF formula which emphasized dividends, and the "common precept" that earnings constitute the source of value for stocks. Indeed, over the long-run, either valuation approach would be expected to produce the same end result. Lastly, Williams also recognized the challenges associated with developing long-term dividend forecasts, when he concluded in *The Theory of Investment Value:* "How to estimate the future dividends for use in our formula is, of course, the difficulty[52]".

4. Growth Component - The Importance of Earnings Growth Forecasts

[52] John Burr Williams, *The Theory of Investment Value* (Cambridge, MA, Harvard University Press, 1938) at 58.

Among the various forms of growth estimates I evaluated, I place the greatest emphasis on the consensus earnings estimates of "sell-side" equity analysts, along with earnings forecasts published by the Value Line Investment Survey. Substantial academic research has demonstrated that equity analyst forecasts have a significant influence on the growth expectations of investors. By way of background, sell-side analysts compile investment research for the major brokerage firms and investment banks on behalf of their clients. This research includes both earnings forecasts and buy/hold/sell recommendations, which the analyst develops based upon a thorough analysis of the company's past performance and future prospects, along with an element of informed judgment. Sell-side analysts typically possess expert knowledge of the industry they cover, and are typically well-versed in key matters affecting the company being evaluated, including recent regulatory decisions, cost and profitability trends, and infrastructure investment requirements. Substantial academic research has demonstrated that the earnings forecasts of equity analysts heavily influence the long-term growth expectations, and therefore investment decisions, of equity investors. For example, In "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return," Harris concludes:

> …a growing body of knowledge shows that analysts' earnings forecasts are indeed reflected in stock prices…..Notions of shareholder required rates of return and risk premia are based in theory on investors' expectations about the future. Research has demonstrated the usefulness of financial analysts' forecasts for such expectations[53].

[53] Robert S. Harris, "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return," *Financial Management,* (Spring 1986), at 59, 66.

Similarly, in "Investor Growth Expectations: Analysts vs. History," Vander Weide and Carleton concluded:

> [First] we found overwhelming evidence that the consensus analysts' forecast of future growth is superior to historically oriented growth measures in predicting the firm's stock price. …Our results also are consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy-and-sell decisions[54].

In *Modern Regulatory Finance*, Morin sums up the academic literature on this topic very effectively where he states:

> Because of the dominance of institutional investors and their influence on individual investors, analysts' forecasts of long-run growth rates provide a sound basis for estimating required returns. Financial analysts exert a strong influence on the expectations of many investors who do not possess the resources to make their own forecasts, that is, they are the cause of g.[55]

Clearly then, a substantial amount of academic research supports the use of analyst earnings forecasts as an appropriate proxy for the expected growth rate component of the DCF constant growth model. For these reasons, I have given considerable weight to the 5-year consensus earnings estimates available from Yahoo/Thomson Reuters and Zacks, along with Value Line's EPS growth forecasts, in deriving my estimates of long-term investor growth expectations.

5. Growth Component – Market-Based Evidence
The Influence of Analyst Estimates on Investor Growth Expectations

[54] James H. Vander Weide and William T. Carleton, "Investor Growth Expectations: Analysts vs. History," *The Journal of Portfolio Management* (Spring 1988), at 4.

[55] Roger A. Morin, *Modern Regulatory Finance* (PUR Books LLC, 2021), at 371.

Analyst earnings forecasts are widely available through a variety of sources and are frequently referenced by both institutional and individual investors and the financial press. Without question, a robust market exists for earnings estimates, which is driven by strong investor demand for such information. Considering that there is a significant monetary cost associated with producing these forecasts, investment firms would not continue to produce them if they were not valued by investors. This is further demonstrated by the ongoing success of the various information service providers who summarize analyst earnings forecasts into "consensus estimates" for the benefit of investors. These information service providers include Thomson Reuters, I/B/E/S, and FactSet, each of which are widely-referenced by institutional investors.

Moreover, the availability of consensus estimates to the general public through freely-accessible websites, such as Yahoo Finance, Zacks and Reuters.com, further demonstrates the pervasive influence that analyst forecasts have on market expectations, including those of individual investors. Lastly, it is important to note that, to date, investors have not demanded earnings forecasts for periods extending beyond five years. If investors had expressed a desire for such information, the robust information services marketplace would have certainly delivered longer-term forecasts by now. This strongly suggests that investors are reasonably confident that the 5-year earnings forecasts they presently utilize already provides a reasonably reliable longer-term growth estimate.

6. Growth Component - Earnings Growth Rates Projected by Equity Analysts

Forecasts of EPS growth and the corresponding cost of equity estimates for each member of the Electric Group, Gas LDC Group and Non-Regulated Group are presented on page 1 of Attachment ES-VVR-4, Attachment ES-VVR-5 and Attachment ES-VVR-6, respectively.

Appendix B - DCF Estimates - Determination of Outlier Results

1. General Approach in Determining the "Low-End" Threshold for Outlier Results

While applying the DCF constant-growth model to the individual proxy group companies, I found both "low-end" and "high-end" outlier results which did not pass fundamental tests of economic logic. Therefore, to ensure logical and credible analytical results, I have eliminated unreasonably high and unreasonably low DCF estimates from my analysis, as further discussed herein.

It is a well-established financial principle that when the risk profile of a given investment increases, investors will demand a commensurately higher rate of return. This classic "risk-and-return" relationship explains why investors demand a higher return for investing in common stocks versus investing in corporate debt securities. Indeed, equity investors are not only compensated for the default risk inherent in fixed-income securities, but they must also be compensated for the residual claim risk they bear. Residual claim risk arises for two primary reasons. First, since common stock is the lowest ranking or most junior capital within a firm's capital structure, common stock investors are always positioned "last in line" behind fixed income investors and preferred stockholders to recover their investment in the event of a financial distress scenario. Second, common stock investors are also in a subordinated position relative to periodic cash distributions, since common stock dividends can only be paid after contractually-required debt service payments and preferred dividend payments have been made. Considering their junior position in the capital structure, common stock investors require additional compensation for bearing this residual claim risk, through what is known as an equity risk premium.

However, in those circumstances where the equity risk premium offered does not provide sufficient compensation for bearing the additional risks associated with common stocks, investors will seek a superior risk-return tradeoff elsewhere by either investing in the company's fixed-income securities, or in another company's common stock. Therefore, consistent with the risk-and-return investment principle and fundamental tests of economic logic, DCF estimates which are lower than, or only marginally higher than, yields available on corporate debt securities have been eliminated from my analysis. This is because investors cannot reasonably be expected to invest in common stocks if they are unable to earn a minimally sufficient equity risk premium as compensation for the additional risks they bear, vis-à-vis fixed income securities. Under these circumstances, investors would clearly show a preference for either holding the company's fixed-income securities or another company's stock, making it difficult for the company to attract new equity capital.

2. Regulatory Precedents Establishing the Minimum Equity Risk Premium for Setting the "Low-End" Outlier Threshold

In recent years, the FERC has compared DCF estimates to yields available on long-term corporate bonds and has excluded proxy group companies whose DCF estimates did not exceed a company's bond yield by a sufficient margin. In *Pioneer Transmission* (2009), the FERC ruled that low-end ROEs falling within about 100 basis points of the cost of debt should be excluded from cost of equity estimates. Specifically, in its Pioneer order, the FERC stated:

> …..the Commission will exclude from the proxy group companies whose low-end ROE is within about 100 basis points above the cost of debt,

> taking into account the extent to which the excluded low-end ROE's are outliers from the low-end ROEs of other proxy group companies[56].

Previously, in Opinion 445, the Commission had determined that:

> …..investors generally cannot be expected to purchase stock if debt, which has less risk than stock, yields essentially the same return[57].

Furthermore, in *Southern California Edison*, the FERC reaffirmed its previous decisions concerning the treatment of low-end outliers, by stating:

> We find that, consistent with *Pioneer*, it is reasonable to exclude any company whose low-end ROE fails to exceed the average bond yield by about 100 basis points or more[58].

Most recently, in *Opinion No. 569*, the FERC revised the methodology it employs in the determination of both low-end and high-end outlier estimates of the cost of equity under the DCF method. The FERC's revised low-end methodology no longer references a generic 100 basis point add-on to the cost of corporate debt, but instead now recognizes the dynamic nature of the equity risk premium, which is dependent upon ever-changing investor risk sentiments. The FERC will now reference Baa-rated corporate bond yields as the corporate bond component of the low-end outlier equation, but will now determine the minimally-required equity risk premium above the corporate bond yield by applying a 20 percent weighting factor to the market risk premium determined under the FERC's CAPM analysis. The FERC explained the rationale for these changes as follows:

> We will adjust the low-end outlier test to include a risk premium instead of the generic 100 basis points proposed in the Briefing Order, as discussed below. In particular, we will adopt a revised low-end outlier test that

[56] *Pioneer Transmission, LLC,* 126 FERC ¶ 61,281 at P 94 (March 27, 2009).
[57] *Southern California Edison Co*., 92 FERC ¶ 61,266 (2000) (Opinion No. 445).
[58] *Southern California Edison Co*., 131 FERC ¶ 61020 at P 55 (April 15, 2010).

> eliminates proxy group ROE results that are less than the yields of generic corporate Baa bonds plus 20 percent of the CAPM risk premium.
> ….
> We find that 20 percent of the risk premium from the CAPM analysis described above is a reasonable risk premium to apply to the low-end outlier test. Because the risk premium that investors demand changes over time, it is imprecise to simply add 100 basis points to the bond yield. The methodology that we adopting in this order captures such changes because the risk premium from the CAPM analysis reflects investors' required risk premium under the prevailing market conditions[59].

In a subsequent Order[60], the FERC reaffirmed its approach of referencing 20 percent of the CAPM risk premium when conducting its low-end outlier evaluations.

In my judgment, the FERC's revised low-end outlier methodology for DCF estimates is an improvement over its previous approach, as it now better captures the dynamic nature of the market risk premium, thus enabling the cost of capital analyst to appropriately apply fundamental tests of economic logic to his/her preliminary DCF results.

3. Applying the FERC's Revised Approach in Determining the "Low-End" Outlier Threshold

As further described within page 7 of Attachment ES-VVR-4, after applying the FERC's revised low-end outlier methodology as outlined above, I have determined that a reasonable low-end outlier threshold to apply to my preliminary DCF results is 7.00 percent. I have therefore

[59] *Association of Businesses Advocating Tariff Equity, et al., v. Midcontinent Independent System Operator, Inc., et al.,* 169 FERC ¶ 61,129, Opinion No. 569, at P 387 and P 388 (November 21, 2019).

[60] *Association of Businesses Advocating Tariff Equity, et al., v. Midcontinent Independent System Operator, Inc., et al.,* 171 FERC ¶ 61,154, Opinion No. 569-A, at P 161-162 (May 21, 2020).

eliminated outlier estimates falling below this minimum threshold level. Consistent with the risk-and-return investment principle, investors cannot reasonably be expected to accept equity returns below this threshold, since on a risk-adjusted basis, fixed-income securities would likely offer investors a superior investment alternative.

4. Regulatory Precedents for Determining the "High-End" Threshold for Outlier Results

In *Opinion No. 569*, the FERC also adopted a revised high-end outlier test, whereby companies having DCF estimates in excess of 150 percent of the median value of the initial proxy group results would be excluded from the final group. In a subsequent Order[61], the FERC elected to modify this approach by instead referencing 200 percent of the median value of the initial proxy group results, and the FERC subsequently reaffirmed this decision in yet another Order[62]. I have taken a similar approach in identifying high-end outlier results in my DCF analyses, but have eliminated individual high-end estimates, rather than fully eliminating the company from the proxy group. In my judgment, this approach is appropriate in view of the relatively small number of regulated utility holding companies to choose from in forming a utility proxy group, which is largely attributable to recent merger and acquisition activity in the utility industry.

[61] *Association of Businesses Advocating Tariff Equity, et al., v. Midcontinent Independent System Operator, Inc., et al.,* 171 FERC ¶ 61,154, Opinion No. 569-A, at P 154 (May 21, 2020).

[62] *Association of Businesses Advocating Tariff Equity, et al., v. Midcontinent Independent System Operator, Inc., et al.,* 173 FERC ¶ 61,159, Opinion No. 569-B, at P 140 (November 19, 2020).

To further screen my DCF results for high-end outlier estimates, I have also considered the FERC's previous high-end outlier methodology in my DCF analyses. Specifically, in *ISO New England*,[63] the FERC determined that proxy group companies with DCF estimates in excess of 17.7 percent should be excluded from DCF analyses. Accordingly, as a further check on the high-end outlier threshold applied within my DCF analyses, I have also given some consideration to the 17.7 percent high-end threshold established in the *ISO New England* case. The results of the high-end outlier screens for my DCF analyses can be found on pages 1 and 2 of Attachment ES-VVR-4, Attachment ES-VVR-5, and Attachment ES-VVR-6, respectively.

[63] *ISO New England, Inc. et al.,* 109 FERC ¶ 61,147 at P 205 (November 3, 2004).

Appendix C - Financial Risk Adjustments to DCF Results

1. Circumstances Under Which a Financial Risk Adjustment is Required for DCF Results

A financial risk or "leverage" adjustment to DCF results is required whenever the average market value equity capitalization of the proxy companies being analyzed is materially higher than the corresponding book value equity capitalization. Stated alternatively, a leverage adjustment is required whenever the average per-share market-to-book ratio of the group materially exceeds 1.0. Whenever a significant market-to-book value disparity exists for a utility, the level of financial risk implicit in the respective market value and book value capital structures can differ substantially. In particular, the market value based capital structure will reflect a higher relative equity capitalization, a lower relative debt capitalization, and therefore less financial risk as compared to the book value capital structure. In contrast, the book value capital structure will reflect a lower relative equity capitalization and a higher relative debt capitalization, thereby indicating a higher degree of financial risk.

To understand the need for a leverage adjustment, it must first be emphasized that DCF cost of equity estimates are market-based estimates which are derived by referencing the stock prices of comparable risk companies as direct inputs into the DCF model. DCF estimates therefore reflect the return expectations of investors based upon the level of financial risk embedded within the corresponding market value capital structure, as indicated by the current stock price. Equity investors are predominately concerned with a firm's market value capital structure, since it reflects the current value of their investment and therefore provides the basis for assessing a company's

financial risk profile. To the extent that a book value based capital structure will be utilized in the rate-setting process, equity investors will expect an additional return premium to be compensated for the additional financial risk inherent within a book value capital structure. Multiple academic studies have demonstrated that a strong positive correlation exists between the amount of leverage in a firm's capital structure and its cost of equity capital, which Morin discusses in *Modern Regulatory Finance,* a widely-recognized authoritative guide on utility cost of capital matters, as follows:

> …..the one inescapable conclusion from the research is that debt affects the cost of equity and that a company has a different cost of equity at a different capital structure, with the cost of equity rising as leverage increases. Therefore, the capital structure used to estimate the cost of equity is an integral inseparable part of that estimate.[64]

Therefore, if market-based DCF estimates of the cost of equity are applied to a utility's book value capital structure in determining the utility's weighted average cost of capital, a leverage adjustment is required to recognize the increase in financial risk resulting from the use of the book value capital structure, rather than the market-value capital structure. It is clear that this adjustment is necessary, since as Morin explains above, *"a company has a different cost of equity at a different capital structure."* Absent this leverage adjustment, the DCF results will be incorrectly specified, since they will reflect the lower level of financial risk associated with a market value based capital structure, rather than the higher risk associated with the book value capital structure, to which the DCF results will be applied.

[64] Roger A. Morin, *Modern Regulatory Finance* (PUR Books LLC, 2021), at 521.

2. Regulatory Precedents Supporting the Use of Financial Risk Adjustments Based on Differences in Market-Value and Book-Value Capitalization Levels

On numerous occasions, the Pennsylvania Public Utility Commission has allowed upward adjustments to the cost of equity to recognize the difference in financial risk between market value based capital structures, which are the basis of DCF estimates, and the book value capital structures used for rate-setting purposes.

3. Determining the Appropriate Financial Risk or "Leverage" Adjustment Utilizing Modigliani and Miller's Classic Financial Theorems

In formulating my proposed leverage adjustments, I have referenced the classic financial theorems of Nobel laureates Modigliani and Miller (M&M), which demonstrated the relationship between a firm's capital structure, its valuation, and its cost of capital.[65] Based on the M&M equation for the cost of equity, and the respective market value and book value capital structure ratios for the Electric Group, the required financial risk or "leverage" adjustments was determined to be as reflected in Table C-1 below:

[65] Franco Modigliani and Merton H. Miller, "Taxes and the Cost of Capital: A Correction," *American Economic Review,* 53 (June 1963), 433-443; Franco Modigliani and Merton H. Miller, *The Cost of Capital, Corporation Finance and the Theory of Investments, American Economic Review* 48 (June 1958) at 261-297.

Table C-1	
Required Financial Leverage Adjustments	
Electric Group	0.49%
Gas LDC Group	0.34%
Non-Regulated Group	0.49%[66]

Supporting calculations for the recommended leverage adjustment is as follows:

$$K_e = p + (p-i)\ (1-T)\ (B/S) + (p-d)\ P/S \qquad \text{(Equation C.1)}$$

Where:

K_e = Estimated cost of equity

p = Cost of equity for a firm financed with 100% equity capital

i = Long-term debt borrowing cost

T = Marginal corporate income tax rate

B = Debt to total capitalization ratio

S = Common stock to total capitalization ratio

d = Preferred stock dividend yield

P = Preferred stock to total capitalization ratio

[66] The magnitude of the difference between the average market value capital structure of the Non-Regulated Group and PSNH's book value based capital structure is significantly greater than the difference between the market value based capital structure of the Electric Group and PSNH's book value capital structure. Therefore, under the M&M equation, the required leverage adjustment for the Non-Regulated Group would be significantly greater than that of the Electric Group. To recognize this disparity and make the financial risk adjustment relevant to a typical electric utility capital structure, I have applied the same adjustment that I applied to the Electric Group (0.49%) to the Non-Regulated Group. Utilizing this approach ensures a more conservative analysis.

Electric Group

$K_e = p + (p-i)\ (1-T)\ (B/S) + (p-d)\ P/S$ (Equation C.1)

10.20% = 8.779% + (8.779% - 5.73%) (1-0.27)(38.8/61.1) + (8.779% - 6.58%) (0.2/61.1)

10.69% = 8.779% + (8.779% - 5.73%) (1-0.27)(46.15/53.85)

Leverage adjustment = 10.69% - 10.20% = 0.49%

Gas LDC Group

$K_e = p + (p-i)\ (1-T)\ (B/S) + (p-d)\ P/S$ (Equation C.1)

10.00% = 8.564% + (8.564% - 5.73%) (1-0.27)(40.0/59.0) + (8.564% - 6.58%) (1.0/59.0)

10.34% = 8.564% + (8.564% - 5.73%) (1-0.27)(46.15/53.85)

Leverage adjustment = 10.34% - 10.00% = 0.34%

Appendix D - Flotation Costs

1. Adjusting the "Bare Bones" Cost of Equity for Flotation Costs

When common equity is employed to finance a utility's rate base, it is either derived from new stock sales or from the retention of undistributed earnings. In cases where a utility or its parent company "floats" a new equity issuance, significant issuance or flotation costs may be incurred, including underwriting discounts, legal fees, accounting fees and printing costs. After subtracting these out-of-pocket costs from the transaction's gross proceeds, the company is left with net proceeds which are materially lower than the amount invested by the company's equity investors. Considering that only net proceeds can be invested into a company's rate base, the amount invested by equity investors which funds flotation related costs will never earn a fair return for those investors unless an appropriate adjustment is made to the cost of equity. As such, if a flotation cost adjustment is not applied to the "bare-bones" cost of equity determined by the various market-based analytical models, the company's equity investors will not earn a fair return on their entire investment, thereby understating the company's legitimate revenue requirement. This is contrary to established regulatory practice for debt issuance costs, which are typically capitalized at the time of issuance and amortized over the life of the outstanding debt, therefore being fully recoverable through the cost of service ratemaking process.

2. Flotation Costs – Multiple of Cost of Equity Approach

Numerous adjustment methods have been proposed to incorporate equity issuance costs into rate proceedings, several of which have been accepted by state regulatory commissions, including the DCF formula approach, multiple of cost of equity approach, basis point approach, and the actual

costs approach. For purposes of this proceeding, I have relied upon the "multiple of cost of equity" approach in determining the appropriate flotation cost adjustment for each of the three proxy groups.

In contrast to debt capital, equity capital is considered to have an infinite life, and it would therefore be inappropriate to amortize a company's flotation costs over a finite number of years. As such, rather than seeking a "return of" its flotation costs over some arbitrarily selected amortization period, it is more appropriate for a utility to seek a "return on" its flotation costs, as these costs constitute a permanent equity contribution by investors. PSNH's ultimate parent, Eversource Energy Inc., ("Eversource") has completed multiple equity offerings over the past two decades (2005-2023) which have benefitted Eversource's utility subsidiaries. Eversource's overall weighted composite flotation cost percentage[67] for these transactions has been 2.37 percent during this period. Nevertheless, considering that Eversource's most recent equity issuances over the past five years have incurred flotation costs in the range of 1.50 percent, I have concluded that a flotation cost percentage of 1.50 percent is a reasonable and conservative value to reference for purposes of the instant proceeding.

Considering that, over the past five years (2019-2023), the contributed capital component of PSNH's common equity account has averaged approximately 68 percent of the Company's total common equity balance, it is appropriate to apply a flotation cost adjustment to PSNH's cost of equity that is based on this 68 percent weighting, since the remaining 32 percent weighting

[67] The weighted composite flotation cost percentage is weighted on the basis of the flotation costs for each individual equity issuance as compared to the overall flotation costs incurred during the 2025-2023 period.

allocated to undistributed retained earnings would not be subject to underwriting costs. Accordingly, in deriving my recommended flotation cost adjustment, I have applied a 68 percent weighting to the recommended 1.50 percent flotation cost value previously discussed, which yields a flotation cost factor of 1.02 percent (1.50% x 68% = 1.02%). To properly apply this level of flotation costs to PSNH's cost of equity under the "multiple of cost of equity" approach, the 1.02 percent flotation cost factor must be added to 100 percent of PSNH's pre-adjusted cost of equity, which is derived in mathematical terms as follows: (1+.0102=1.0102%). Therefore, based upon the above approach, I have applied a 1.0102 percent multiple to the *pre-adjusted* indicated cost of equity for each of the respective proxy groups.