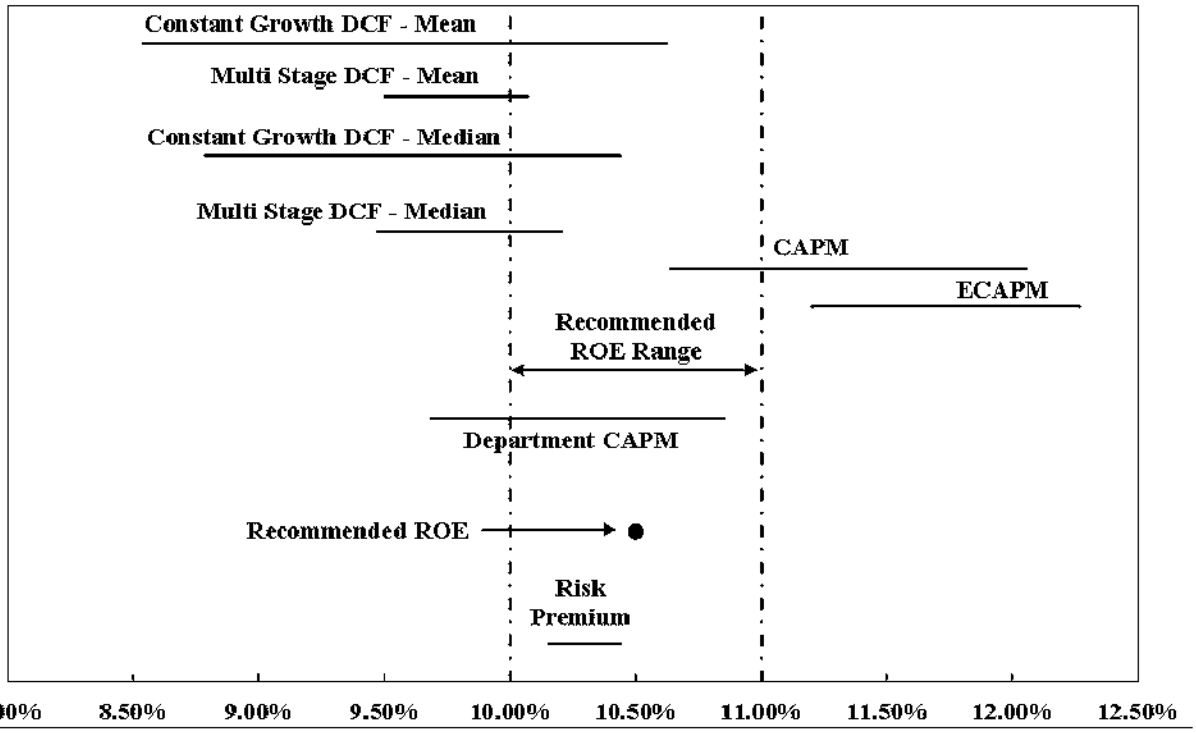
and support credit quality, and the requirement that the result lead to just and reasonable rates.

- The effect of current and prospective capital market conditions on the cost of equity estimation models and on investors' return requirements.
- The results of several analytical approaches that provide estimates of the Company's cost of equity. Because the Company's authorized ROE should be a forward-looking estimate over the period during which the rates will be in effect, these analyses rely on forward-looking inputs and assumptions, such as projected analyst growth rates in the DCF model; a forecasted risk-free rate and market risk premium in the CAPM analysis.
- Although the companies in my proxy group are generally comparable to the Company, each company is unique, and no two companies have the exact same business and financial risk profiles. Accordingly, I considered the Company's regulatory, business, and financial risks relative to the proxy group of comparable companies in determining where the Company's ROE should fall within the reasonable range of analytical results to appropriately account for any residual differences in risk.

Q. What are the results of the models that you have used to estimate the cost of equity for the Company?

A. Figure 1, below, and Exhibit NG-AEB-2 summarize the range of results produced by the constant growth DCF, multi-stage DCF, CAPM, ECAPM, and BYRP analyses.

Figure 1: Summary of Analytical Results



As shown in Figure 1 and in Exhibit NG-AEB-2, the range of results produced by the cost of equity estimation models is wide. While it is common to consider multiple models to estimate the cost of equity, it is particularly important when the range of results varies considerably across methodologies.

Q. Is it important to consider prospective capital market conditions in setting the authorized ROE in this proceeding?

A. Yes. Capital market conditions affect the investor required return and the results of the cost of equity estimation models. Specifically:

- Long-term interest rates have increased substantially in the past year and a half and are expected to remain relatively high at least over the next year in response to inflation.
- Over the past year, utilities have underperformed the broader market. Between January 1, 2023 and September 30, 2023, the S&P 500 Utilities Index had a total return of negative 16.5 percent. During the same period, the S&P 500 Index had a total return of 11.7 percent.[2] It is reasonable to expect this relationship to continue, as interest rates remain high or increase and investors have the option to invest in lower risk investments at similar returns offered on utility equity.
- Equity analysts have noted the increased risk for the utility sector as a result of rising interest rates and expect the sector to underperform over the near-term.
- Consequently, the results of the DCF model, which relies on current utility share prices, are likely to understate the cost of equity during the period that the Company's rates will be in effect.
- In May 2023, S&P Global Ratings revised its outlook for the investor-owned North American regulated utility industry to stable from negative. However, it noted that significant risks for the industry remain, such as inflation and high levels of capital spending.[3] S&P Global Ratings further noted that credit quality weakened over the past three years because of increasing influence of environmental, social, and governance ("ESG") credit factors and high capital spending. Funding of capital spending in a credit-supportive manner is also a key concern.

It is appropriate to consider all of these factors when estimating a reasonable range of the investor-required cost of equity and the recommended ROE for the Company.

Q. What is your recommended ROE for the Company in this proceeding?

A. Considering the analytical results presented in Figure 1, current and prospective capital market conditions, and the Company's regulatory, business, and financial risk relative to

[2] S&P Dow Jones Indices.

[3] S&P Global Ratings. "The Outlook For North American Regulated Utilities Turns Stable." May 18, 2023.

the proxy group, I conclude that an ROE in the range of 10.00 percent to 11.00 percent is reasonable, and within that range, I recommend an ROE of 10.50 percent.

Q. Is your recommended ROE reasonable based on recent ROE authorizations made by the Department?

A. Yes. The Department authorized an ROE of 9.80 percent for NSTAR Electric Company d/b/a Eversource Energy ("NSTAR Electric") on November 30, 2022,[4] based on data submitted through May 11, 2022.[5] As shown in Figure 2, below, the 30-day average yield on the 30-year Treasury bond was approximately 2.87 percent at that time, which has since increased by 155 basis points to the current 30-day average yield of 4.42 percent. Further, while inflation has come down from its peak, it has required extensive monetary policy actions by the Federal Reserve, including an increase in the federal funds rate of 4.50 percent since the data the Department considered in D.P.U. 22-22. Therefore, it is reasonable to expect that the cost of equity has increased since the Department established the authorized ROE in the NSTAR Electric case.

[4] NSTAR Electric Company, D.P.U. 22-22, Order, November 30, 2022, at 403.

[5] D.P.U. 22-22, Exhibit ES-VVR-Rebuttal-3 (final).xlsx, p. 3, which indicates that the stock price averaging periods relied upon were through May 11, 2022.

Figure 2: Comparison of Market Data Currently Relative to the Time of the Department's Most Recent Rate Determinations

Docket No	Analytical Date	Federal Funds Rate	Yield on 30-Year Treasury	Core Inflation Rate	Authorized ROE
D.P.U.22-22	5/11/2022	0.83%	2.87%	6.02%	9.80%
Current Proceeding	**9/30/2023**	**5.33%**	**4.42%**	**3.71%**	
Change		4.50%	1.55%	(2.31%)	

Q. Is the Company's projected capital structure reasonable and appropriate?

A. Yes. The Company's proposed equity ratio of 53.48 percent is within the range of equity ratios for the utility operating subsidiaries of the proxy group companies. This is particularly important to consider given that credit rating agencies have identified in their outlook for the utility sector significant risks such as relatively high interest rates and inflation, record levels of capital spending, and the need to fund capital spending in a credit supportive manner. Supportive regulatory outcomes are critical to maintaining the financial health of regulated utilities. This support is even more important as the Company is required to make significant investments in the electric distribution system to achieve the Commonwealth's energy policy objectives.

IV. Regulatory Guidelines

Q. Please describe the guiding principles to be used in establishing the cost of capital for a regulated utility.

A. The United States Supreme Court's precedent-setting Hope and Bluefield cases established the standards for determining the fairness or reasonableness of a utility's allowed ROE.

Among the standards established by the Supreme Court in those cases are: (1) consistency with other businesses having similar or comparable risks; (2) adequacy of the return to support credit quality and access to capital; and (3) the principle that the result reached, as opposed to the methodology employed, is the controlling factor in arriving at just and reasonable rates.[6]

Q. Has the Department provided similar guidance?

A. Yes. The Department has consistently recognized the precedent established under Hope and Bluefield:

> The standard for determining the allowed ROE is set forth in Bluefield at 692-693 and Hope at 603. The allowed ROE should preserve a company's financial integrity, allow it to attract capital on reasonable terms, and be comparable to returns on investments of similar risk. See Bluefield at 692-693; Hope at 603, 605. The allowed ROE should be determined "having regard to all relevant facts." Bluefield at 692.[7]

Q. Why is it important for a utility to be allowed the opportunity to earn an ROE that is adequate to attract capital at reasonable terms?

A. An authorized ROE that is adequate to attract capital at reasonable terms enables the utility to continue to provide safe and reliable service while maintaining its financial integrity. That return should be commensurate with returns required by investors elsewhere in the market for investments of comparable risk. It is important to recognize that equity

[6] Hope, 320 U.S. 591 (1944); Bluefield, 262 U.S. 679 (1923).

[7] See, e.g., NSTAR Gas Company, D.P.U. 14-150, Order, October 30, 2015, at 362; Fitchburg Gas and Electric Light Company, D.P.U. 15-81, Order, April 29, 2016, at 290.

investors have a choice of where to invest capital. If the authorized ROE is not comparable to the returns available for comparable risk investments, it is not just the value to current equity holders that will be harmed, but rather, access to incremental equity is also affected. It is reasonable to expect that equity investors will seek alternative investment opportunities for which the expected return reflects the perceived risks, thereby inhibiting the Company's ability to attract new equity capital at reasonable cost.

Q. Is a utility's ability to attract capital also affected by the ROEs that are authorized for other utilities?

A. Yes. Utilities compete directly for capital with other investments of similar risk, which include other electric, natural gas, and water utilities. Therefore, the ROE authorized for a utility sends an important signal to investors regarding whether there is regulatory support for financial integrity, dividends, growth, and fair compensation for business and financial risk. The cost of capital represents an opportunity cost to investors. If higher returns are available elsewhere for other investments of comparable risk over the same time-period, investors have an incentive to direct their capital to those alternative investments. Thus, an authorized ROE significantly below authorized ROEs for other electric, natural gas, and water utilities can inhibit the utility's ability to attract capital for investment.

Q. Is the regulatory framework and the authorized ROE and equity ratio important to the financial community?

A. Yes. The regulatory framework is one of the most important factors in debt and equity investors' assessments of risk. Specifically regarding debt investors, credit rating agencies

consider the authorized ROE and equity ratio for regulated utilities to be very important for two reasons: (1) they help determine the cash flows and credit metrics of the regulated utility; and (2) they provide an indication of the degree of regulatory support for credit quality in the jurisdiction. To the extent that the authorized returns in a jurisdiction are insufficient, credit rating agencies will consider this in the overall risk assessment of the regulatory jurisdiction in which the company operates. Not only do credit ratings affect the overall cost of borrowing, they also act as a signal to equity investors about the risk of investing in the equity of a company.

Q. What is the standard for setting the ROE in any jurisdiction?

A. The stand-alone ratemaking principle is the foundation of jurisdictional ratemaking. This principle requires that the rates charged in any operating jurisdiction be for the costs incurred in that jurisdiction. The stand-alone ratemaking principle ensures that customers in each jurisdiction only pay for the costs of the service provided in that jurisdiction, which is not influenced by the business operations in other operating companies. In order to maintain this principle, the cost of equity analysis is performed for an individual operating company as a stand-alone entity. As such, I have evaluated the investor-required return for the Company's operations in Massachusetts.

Q. What are your conclusions regarding regulatory guidelines?

A. The ratemaking process is premised on the principle that, in order for investors and companies to commit the capital needed to provide safe and reliable utility services, a

utility must have a reasonable opportunity to recover the return of, and the market-required return on, its invested capital. Accordingly, the Department's order in this proceeding should establish rates that provide the Company with a reasonable opportunity to earn an ROE that is: (1) adequate to attract capital at reasonable terms; (2) sufficient to ensure its financial integrity; and (3) commensurate with returns on investments in enterprises with similar risk. It is important for the ROE authorized in this proceeding to take into consideration current and projected capital market conditions, as well as investors' expectations and requirements for both risks and returns. Because utility operations are capital-intensive, regulatory decisions should enable the utility to attract capital at reasonable terms under a variety of economic and financial market conditions. Providing the opportunity to earn a market-based cost of capital supports the financial integrity of the Company, which is in the interest of both customers and shareholders.

V. Capital Market Conditions

Q. Why is it important to analyze capital market conditions?

A. The models used to estimate the cost of equity rely on market data that are specific either to the proxy group, in the case of the DCF model, or to the expectations of market risk, in the case of the CAPM. The results of the cost of equity estimation models can be affected by prevailing market conditions at the time the analysis is performed. While the ROE established in a rate proceeding is intended to be forward-looking, the analyst uses both current and projected market data, specifically stock prices, dividends, growth rates, and

interest rates, in the cost of equity estimation models to estimate the investor-required return for the subject company.

Analysts and regulatory commissions recognize that current market conditions affect the results of the cost of equity estimation models. As a result, it is important to consider the effect of the market conditions on these models when determining an appropriate range for the ROE and the recommended ROE for ratemaking purposes for a future period. If investors do not expect current market conditions to be sustained in the future, it is possible that the cost of equity estimation models will not provide an accurate estimate of investors' required return during that rate period. Therefore, it is very important to consider projected market data to estimate the return for that forward-looking period.

Q. What factors affect the cost of equity for regulated utilities in the current and prospective capital markets?

A. The cost of equity for regulated utility companies is affected by several factors in the current and prospective capital markets, including: (1) changes in monetary policy; (2) relatively high inflation; and (3) increased interest rates that are expected to remain relatively high over the next few years. These factors affect the assumptions used in the cost of equity estimation models.

Q. What effect do current and prospective market conditions have on the cost of equity for the Company?

A. As discussed in more detail in the remainder of this section, the combination of persistently high inflation and the Federal Reserve's changes in monetary policy contribute to an expectation of an increase in the cost of the investor-required return. It is essential that these factors be considered in setting the forward-looking ROE. Inflation has recently been at some of the highest levels seen in approximately 40 years, and while inflation has declined from these recent peaks, it remains relatively high. Interest rates, which have increased significantly from pandemic-related lows seen in 2020, are expected to continue to remain relatively high in direct response to the Federal Reserve's use of monetary policy to combat inflation. These market conditions are indicative of an increase in the cost of equity because (i) there is a strong historical inverse correlation between interest rates (i.e., yields on long-term government bonds) and the share prices of utility stocks (i.e., as interest rates increase, utility share prices decline, and thus utility dividend yields increase); and (ii) the yields on long-term government bonds currently exceed the dividend yields of utilities, whereas historically long-term government bond yields have been lower than the dividend yields of utilities. Because the cost of equity in this proceeding is being estimated for the future period that the Company's rates will be in effect, and because the cost of equity is expected to increase over the near term for utilities, cost of equity estimates based in whole or in part on historical or current market conditions, as opposed to projected

market conditions, will likely understate the cost of equity during the future period that the Company's rates will be in effect.

A. Inflationary Expectations in Current and Projected Capital Market Conditions

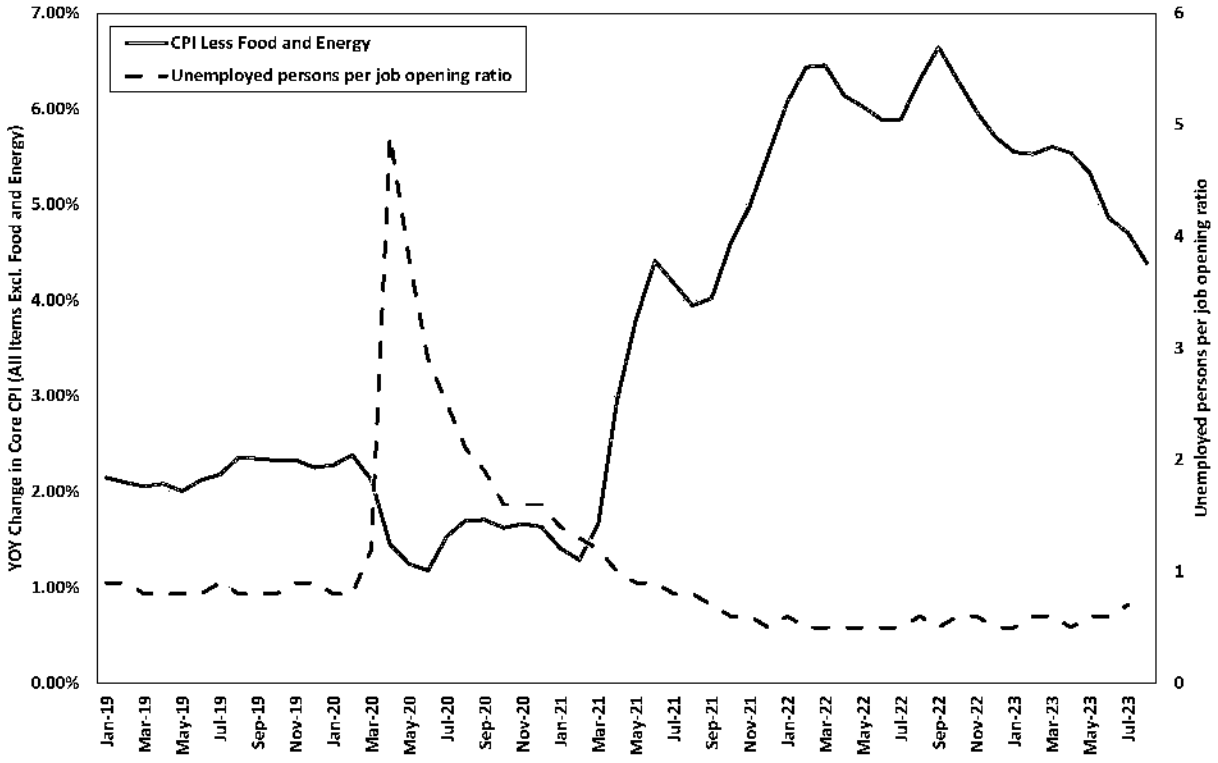
Q. Has inflation increased significantly over the past year?

A. Yes. Figure 3 presents the year-over-year ("YOY") change in core inflation, as measured by the Consumer Price Index ("CPI") excluding food and energy prices as published by the Bureau of Labor Statistics. I considered core inflation because it is the preferred inflation indicator of the Federal Reserve for determining the direction of monetary policy. Core inflation is preferred by the Federal Reserve because it removes the effect of food and energy prices, which can be highly volatile. As shown in Figure 3, core inflation increased steadily beginning in early 2021, rising from 1.41 percent in January 2021 to a high of 6.64 percent in September 2022, which was the largest 12-month increase since 1982. Since that time, while core inflation has declined in response to the Federal Reserve's monetary policy, core inflation continues to remain significantly above the Federal Reserve's target level of 2.0 percent.

Finally, as shown in Figure 3, I also considered the ratio of unemployed persons per job opening, which is currently 0.7 and has been consistently below 1.0 since 2021, despite the Federal Reserve's accelerated policy normalization. This metric indicates sustained strength in the labor market. Given the Federal Reserve's dual mandate of maximum employment and price stability, the continued increased levels of core inflation coupled

with the strength in the labor market has resulted in the Federal Reserve's sustained focus on the priority of reducing inflation.

Figure 3: Core Inflation and Unemployed Persons-to-Job Openings, January 2019 to September 2023[8]



Q. What are the expectations for inflation over the near-term?

A. The Federal Reserve has indicated that it expects inflation will remain elevated above its target level over at least the next year and that monetary policy will remain restrictive in order to reduce inflation. For example, Federal Reserve Chair Powell at the Federal Open

[8] Bureau of Labor Statistics.

Market Committee ("FOMC") meeting in September 2023 observed that while inflation is off of its recent highs, it remains significantly above the Federal Reserve's long-term target and noted that further policy firming is possible, including additional increases in the federal funds rate:

> Inflation remains well above our longer-run goal of 2 percent. Based on the Consumer Price Index, or CPI, and other data, we estimate that total PCE prices rose 3.4 percent over the 12 months ending in August; and that, excluding the volatile food and energy categories, core PCE prices rose 3.9 percent. Inflation has moderated somewhat since the middle of last year, and longer-term inflation expectations appear to remain well anchored, as reflected in a broad range of surveys of households, businesses, and forecasters, as well as measures from financial markets. Nevertheless, the process of getting inflation sustainably down to 2 percent has a long way to go. The median projection in the SEP for total PCE inflation is 3.3 percent this year, falls to 2.5 percent next year, and reaches 2 percent in 2026.[9]

At the September 2023 FOMC meeting, Chair Powell also noted that the current estimates of FOMC participants suggest that monetary policy will be more restrictive for longer as compared to those same estimates as of the June 2023 FOMC meeting. [10]

B. The Use of Monetary Policy to Address Inflation

Q. What policy actions has the Federal Reserve enacted to respond to increased inflation?

A. The dramatic increase in inflation has prompted the Federal Reserve to pursue an aggressive normalization of monetary policy, removing the accommodative policy

[9] Federal Reserve, Transcript of Chair Powell's Press Conference, September 20, 2023, p 2.

[10] Id., at 3

programs used to mitigate the economic effects of COVID-19. Beginning in March 2022 and through September 20, 2023, the Federal Reserve increased the target federal funds rate through a series of increases from a range of 0.00 to 0.25 percent to a range of 5.25 percent to 5.50 percent.[11] Further, in the July 25, 2023 meeting, the FOMC participants stressed that inflation remained unacceptably high and that further evidence would be required for them to be confident that inflation was on a clear path towards the Committee's two percent objective.[12] The Federal Reserve remained committed to returning inflation to that two percent objective.[13]

C. The Effect of Inflation and Monetary Policy on Interest Rates and the Investor-Required Return

Q. Have the yields on long-term government bonds increased in response to inflation and the Federal Reserve's normalization of monetary policy?

A. Yes. As the Federal Reserve has substantially increased the federal funds rate and decreased its holdings of Treasury bonds and mortgage-backed securities in response to increased levels of inflation that have persisted for longer than originally projected, longer term interest rates have also increased. As shown in Figure 4 below, since the Federal Reserve's December 2021 meeting, the yield on 10-year Treasury bonds has more than

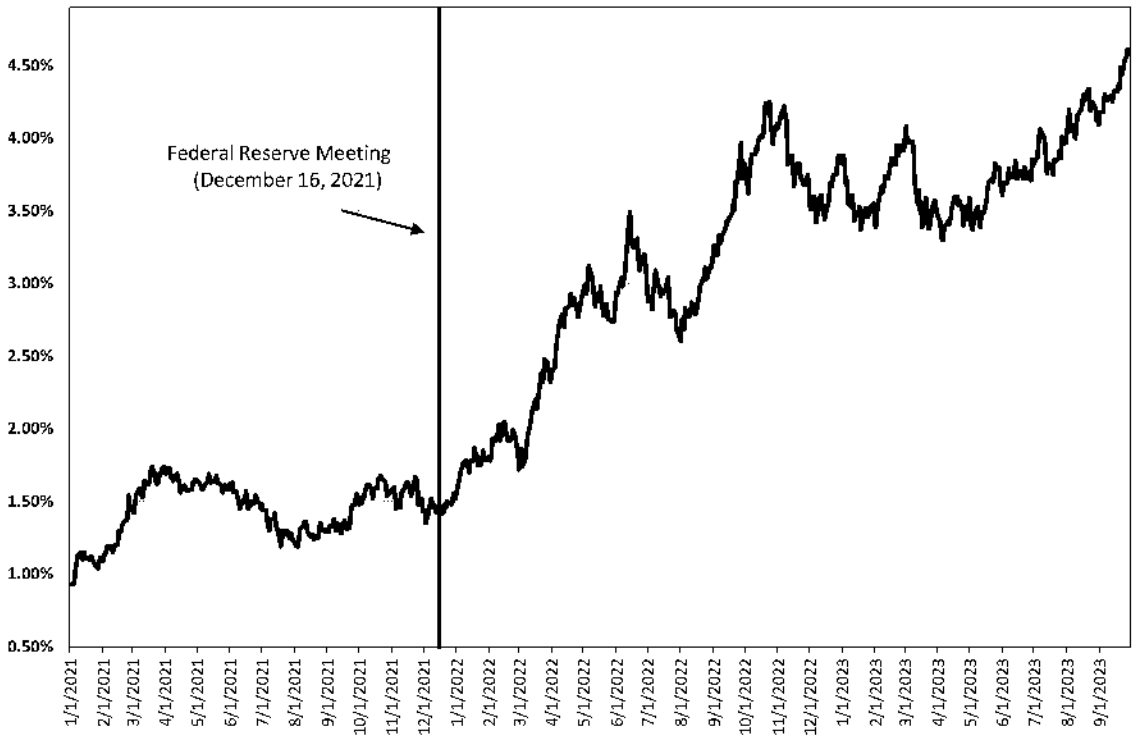
[11] Federal Reserve, Press Releases, March 16, 2022, May 4, 2022, June 15, 2022, September 22, 2022, November 2, 2022, February 1, 2023, March 22, 2023, May 3, 2023, July 25, 2023, September 20, 2023

[12] Federal Reserve Minutes of the Meeting of July 25, 26, 2023 at 7.

[13] Id., at 9.

doubled, increasing from 1.47 percent on December 15, 2021, to 4.59 percent at the end of September 2023.

Figure 4: 10-Year Treasury Bond Yield, January 2021 – September 2023[14]



Q. How have interest rates and inflation changed since the Company's last rate case?

A. As shown in Figure 5, below, when the Department authorized an ROE of 9.60 percent in September 2019 in the Company's last rate case proceeding in D.P.U. 18-150, interest rates, as measured by the 30-year Treasury bond yield, were 2.11 percent[15] and core

[14] S&P Capital IQ Pro.

[15] Thirty-day average of Treasury bond yields ending September 30, 2019.

inflation was 2.34 percent.[16] However, since the Company's last rate proceeding, long-term interest rates have increased to 4.42 percent[17] and, as discussed, after reaching a peak in the summer of 2022, core inflation is currently at 4.13 percent.[18] These factors all demonstrate that the current cost of capital is higher than at the time of the Company's last rate case proceeding.

Figure 5: Change in Market Conditions Since Company's Last Rate Case[19]

Docket	Decision Date	Federal Funds Rate	30-Day Average Of 30-Year Treasury Bond Yield	Core Inflation Rate	Authorized ROE
18-150	9/30/2019	1.90%	2.11%	2.34%	9.60%
Current	9/30/2023	5.33%	4.42%	4.13%	
Change		3.43%	2.31%	1.79%	

Q. What have equity analysts said about long-term government bond yields?

A. Leading equity analysts have noted that they expect the yields on long-term government bonds to remain elevated through at least the first quarter of 2025. According to the most

[16] U.S. Bureau of Labor Statistics.

[17] Thirty-day average of Treasury bond yields ending September 30, 2023.

[18] U.S. Bureau of Labor Statistics.

[19] St. Louis Federal Reserve Bank; Bureau of Labor Statistics.

recent Blue Chip Financial Forecasts report, the consensus estimate of the average yield on the 10-year Treasury bond is at least 3.80 percent through the first quarter of 2025.[20] It is reasonable to expect that if government bond yields remain elevated, the cost of equity will be increasing above the levels experienced in the 2020 and 2021 lower interest rate environment.

D. Expected Performance of Utility Stocks and the Investor-Required Return on Utility Investments

Q. Are utility share prices correlated to changes in the yields on long-term government bonds?

A. Yes. Interest rates and utility share prices are inversely correlated, which means that increases in interest rates result in declines in the share prices of utilities and vice versa. For example, Goldman Sachs and Deutsche Bank examined the sensitivity of share prices of different industries to changes in interest rates over the past five years. Both Goldman Sachs and Deutsche Bank found that utilities had one of the strongest negative relationships with bond yields (i.e., increases in bond yields resulted in the decline of utility share prices).[21]

[20] Blue Chip Financial Forecasts, Vol. 42, No. 10, October 2, 2023.

[21] Lee, Justina. "Wall Street Is Rethinking the Treasury Threat to Big Tech Stocks." Bloomberg.com, March 11, 2021.

Q. How do equity analysts expect the utilities sector to perform in an increasing interest rate environment?

A. Equity analysts project that utilities will continue to underperform the broader market given high inflation and the recent increases in interest rates. Fidelity classifies the utility sector as underweight,[22] and Bank of America recently noted that they are "not so constructive on Utilities" given that the dividend yields for utilities are below both the yields available on long- and short-term treasury bonds.[23]

Q. How has the utility sector performed in 2023?

A. As interest rates have increased substantially over the past year, the valuations of utilities have declined. Recently, Bank of America indicated that the utilities sector has been the worst performing of the S&P sectors, and despite the decline in utility stock prices, they were not recommending a rotation back into the sector, which suggests that equity investors expect further decline in the sector.

> Despite utilities -13% YTD decline, the clear worst S&P subsector, we do not view the pullback as an overly attractive buying opportunity. At risk of overly simplifying, the utilities sector has simply been tracking US Treasury rates. With most utilities yielding below 4%, the merits of ownership for a wide group of investors is simply not there vs Treasuries at 4.3% +. . . and 5.3% short-term.[24]

[22] Fidelity. "Third Quarter 2023 Investment Research Update." July 24, 2023, at 3.

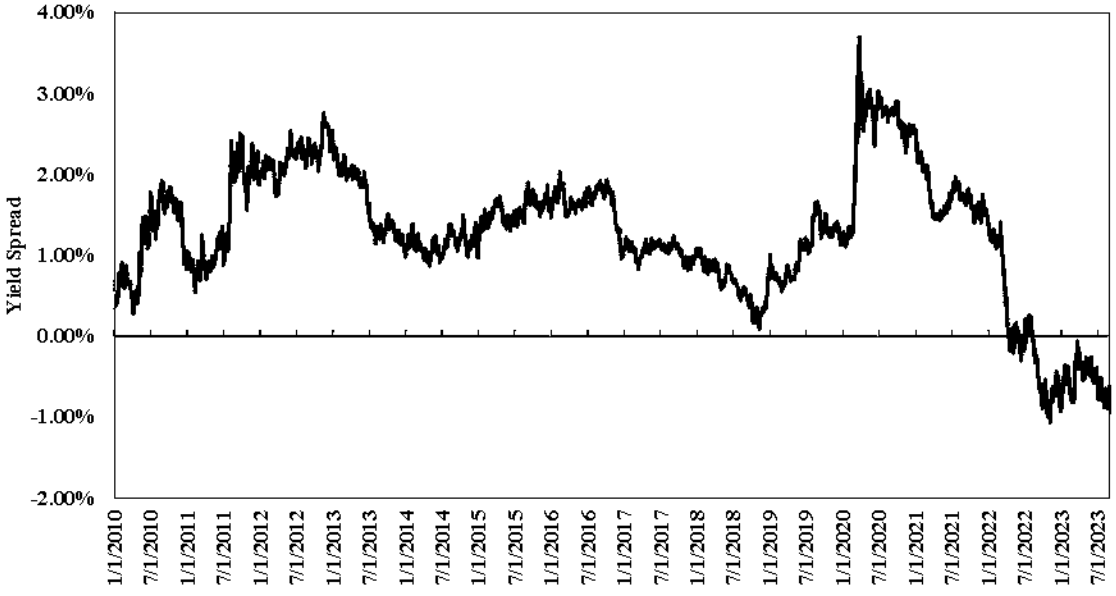
[23] Dumoulin-Smith, Julien, et. al. "US Electric Utilities & IPPs: As the leaves fall, preparing for Autumn utility outlook. Macro still has potholes." BofA Securities, September 6, 2023.

[24] Id.

Q. Is it reasonable to expect that utilities will continue to underperform the market?

A. Yes. To illustrate why this is reasonable, I examined the difference between the dividend yields of utility stocks and the yields on long-term government bonds from January 2010 through September 2023 ("yield spread"). I selected the dividend yield on the S&P Utilities Index as the measure of the dividend yields for the utility sector and the yield on the 10-year Treasury bond as the estimate of the yield on long-term government bonds. As shown in Figure 6, below, the recent significant increase in long-term government bonds yields has resulted in the yield on long-term government bonds exceeding the dividend yields of utilities. The yield spread as of September 30, 2023 is negative 0.92 percent. However, the long-term average yield spread from 2010 to 2023 is positive 1.26 percent. Therefore, the current yield spread is well below the long-term average.

Figure 6: Spread Between the S&P Utilities Index Dividend Yield and the 10-Year Treasury Bond Yield, March 2010 – September 2023[25]



For further context as to how unlikely it is to have a yield spread of negative 0.92 percent, I calculated the z-score for the current yield spread, which measures the number of standard deviations from the mean. The current yield spread of negative 0.92 percent has a z-score of negative 2.63, therefore, a yield spread of negative 0.92 percent is more than 2 standard deviations from the mean of 1.27 percent.[26] In other words, 95 percent of the daily yield spread observations from 2010 through September 2023 fall between negative 0.40 percent

[25] S&P Capital IQ Pro and Bloomberg Professional.

[26] The z-score is calculated as: (yield spread at September 30, 2023 minus average yield spread January 2010 through September 30, 2023)/standard deviation of yield spread from 2010 through September 2023. This equals: (-0.0092 minus 0.0126)/0.0083.

and 2.92 percent, with the current yield spread of negative 0.92 percent being outside of that range. Thus, the current yield spread is an outlier, which is why equity analysts do not expect this current level to hold.

Since long-term bond yields are expected to remain elevated at current levels over the near-term, equity analysts expect utilities to underperform, and thus the dividend yields for utilities will increase. This is because investors that purchased utility stocks as an alternative to the lower yields on long-term government bonds would otherwise be inclined to rotate back into government bonds, particularly as the yields on long-term government bonds remain elevated, thus resulting in a decrease in the share prices of utilities.

Q. What is the significance of the inverse relationship between interest rates and utility share prices in the current market?

A. If interest rates remain relatively high as expected, then the share prices of utilities, which have been underperforming the broader market in 2023, would be expected to continue to underperform. If the prices of utility stocks continue to decline, then the DCF model, which relies on historical averages of share prices to calculate the dividend yield, is likely to understate the dividend yield and, thus, the cost of equity.

Q. Have regulatory commissions acknowledged that the DCF model might understate the cost of equity given current capital market conditions?

A. Yes. For example, in its May 2022 decision in establishing the cost of equity for Aqua Pennsylvania, Inc., the Pennsylvania Public Utility Commission ("PPUC") specifically

concluded that the current capital market conditions of high inflation and increasing interest rates has resulted in the DCF model understating the utility cost of equity, and that weight should be placed on risk premium models, such as the CAPM, in the determination of the ROE:

> To help control rising inflation, the Federal Open Market Committee has signaled that it is ending its policies designed to maintain low interest rates. Aqua Exc. at 9. Because the DCF model does not directly account for interest rates, consequently, it is slow to respond to interest rate changes. However, I&E's CAPM model uses forecasted yields on ten-year Treasury bonds, and accordingly, its methodology captures forward looking changes in interest rates.
>
> Therefore, our methodology for determining Aqua's ROE shall utilize both I&E's DCF and CAPM methodologies. As noted above, the Commission recognizes the importance of informed judgment and information provided by other ROE models. In the 2012 PPL Order, the Commission considered PPL's CAPM and RP methods, tempered by informed judgment, instead of DCF-only results. We conclude that methodologies other than the DCF can be used as a check upon the reasonableness of the DCF derived ROE calculation. Historically, we have relied primarily upon the DCF methodology in arriving at ROE determinations and have utilized the results of the CAPM as a check upon the reasonableness of the DCF derived equity return. As such, where evidence based on other methods suggests that the DCF-only results may understate the utility's ROE, we will consider those other methods, to some degree, in determining the appropriate range of reasonableness for our equity return determination. In light of the above, we shall determine an appropriate ROE for Aqua using informed judgement based on I&E's DCF and CAPM methodologies.[27]
>
> . . .
>
> We have previously determined, above, that we shall utilize I&E's DCF and CAPM methodologies. I&E's DCF and CAPM produce a range of

[27] Pennsylvania Public Utility Commission, Opinion and Order, Docket Nos. R-2021-3027385 and R-2021-3027386, May 12, 2022, at 154–155.

> reasonableness for the ROE in this proceeding from 8.90% [DCF] to 9.89% [CAPM]. Based upon our informed judgment, which includes consideration of a variety of factors, including increasing inflation leading to increases in interest rates and capital costs since the rate filing, we determine that a base ROE of 9.75% is reasonable and appropriate for Aqua.[28]

More recently, the Department has also recently came to a similar conclusion:

> The Department recently considered the relationship between low interest rates and utility stock prices over the last several years and whether a projected increase in long-term interest rates caused the DCF analysis to understate the cost of equity. D.P.U. 20-120, at 416-419. The Department found that, although utility stocks had increased above historic levels in conjunction with low interest rates, the evidence in that proceeding that long-term interest rates would change was speculative. D.P.U. 20-120, at 417-419. In this proceeding, the record is clear that long-term interest rates have increased compared to the period of time from which the parties derived the dividend yields used in the DCF analyses (Exh. ES-VVR-Rebutal-1, at 23-26; Tr. 14, at 1463). We also have considered the Attorney General's evidence of investors forecasting that utility stocks will retain their high valuations in the near term (Tr. 14, at 1449-1452; RR-DPU-48). ***Based on the foregoing evidence, the Department finds that there is greater certainty that the DCF results understate the Company's cost of equity.***[29]

[28] Id., at 177–178.

[29] NSTAR Electric Company, D.P.U. 22-22, November 30, 2022, at 385-386; emphasis added.

E. Conclusion

Q. What are your conclusions regarding the effect of current market conditions on the cost of equity for the Company?

A. Investors expect long-term interest rates to remain relatively high through 2024 in response to continued elevated levels of inflation and the Federal Reserve's normalization of monetary policy. Because the share prices of utilities are inversely correlated to interest rates, and government bond yields are already greater than utility stock dividend yields, the share prices of utilities are likely to continue to decline, which is the reason a number of equity analysts have classified the sector as either underperform or underweight. The expected underperformance of utilities means that DCF models using recent historical data likely underestimate investors' required return over the period that rates will be in effect. Therefore, this expected change in market conditions supports consideration of the higher end of the range of cost of equity results produced by the DCF models. Moreover, prospective market conditions warrant consideration of forward-looking cost of equity estimation models such as the CAPM and ECAPM, which better reflect expected market conditions.

VI. Proxy Group Selection

Q. Please provide a brief profile of the Company.

A. The Company is an electric retail distribution company providing electric service to approximately 1.4 million customers in Massachusetts.[30] The properties of the Company consist of substations and distribution lines. The Company is a wholly-owned subsidiary of National Grid USA, a public utility holding company. For the year ending March 31, 2023 (the "Test Year"), the Company had revenues of approximately $2.9 billion and total assets of $7.9 billion.[31] The Company has long-term issuer ratings of BBB+ (Outlook: Stable) and Baa1 (Outlook: Stable) from Standard and Poor's ("S&P") and Moody's Investors Service ("Moody's"), respectively.

Pursuant to a settlement agreement associated with National Grid USA's purchase of Nantucket Electric in 1996, which the Department approved, Mass. Electric and its affiliate, Nantucket Electric, are considered as one regulated entity for the purpose of recovering costs and establishing rates assessed to customers, with the exception of the recovery of Nantucket Electric's investment in two undersea electric cables.

[30] Mass. Electric and Nantucket Electric, Financial Statements for the years ended March 31, 2023, 2022, and 2021, at 10.

[31] Mass. Electric and Nantucket Electric, Financial Statements for the years ended March 31, 2023, 2022, and 2021, at 5 and 7.

Q. Why have you used a group of proxy companies to estimate the cost of equity for the Company?

A. One of the purposes of this proceeding is to estimate the cost of equity for a utility company that is not itself publicly traded. Because the cost of equity is a market-based concept and the Company's operations do not make up the entirety of a publicly traded entity, it is necessary to establish a group of companies that are both publicly traded and comparable to the Company in certain fundamental business and financial respects to serve as its "proxy" in the cost of equity estimation process.

Even if the Company's electric utility operations did constitute the entirety of a publicly-traded entity, it is possible that transitory events could bias its market value over a given period of time. A significant benefit of using a proxy group is that it moderates the effects of unusual events that may be associated with any one company. The proxy companies used in my analyses all possess a set of operating and risk characteristics that are substantially comparable to the Company, and thus provide a reasonable basis to derive and estimate the appropriate cost of equity for the Company.

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

A. I began with the group of 36 companies that Value Line classifies as electric utilities and applied the following screening criteria to exclude companies that:

- Do not pay consistent quarterly cash dividends because such companies cannot be analyzed using the Constant Growth DCF model.

- Do not have positive long-term earnings growth forecasts from at least two equity sources.
- Do not have investment grade long-term issuer ratings from both S&P and Moody's.
- Were party to a merger or transformative transaction during the analytical period considered.
- Do not derive at least 70 percent of the Company's operating income from regulated operations.

Q. What is the composition of your proxy group?

A. My proxy group consists of the 26 companies shown in Figure 7, below.

Figure 7: Proxy Group

Company	Ticker	Company	Ticker
ALLETE, Inc.	ALE	Evergy, Inc.	EVRG
Alliant Energy Corporation	LNT	IDACORP, Inc.	IDA
Ameren Corporation	AEE	MGE Energy, Inc.	MGEE
American Electric Power Company, Inc.	AEP	NextEra Energy, Inc.	NEE
Avista Corporation	AVA	NorthWestern Corporation	NWE
Black Hills Corporation	BKH	OGE Energy Corporation	OGE
CenterPoint Energy, Inc.	CNP	Pinnacle West Capital Corporation	PNW
CMS Energy Corporation	CMS	Portland General Electric Company	POR
Consolidated Edison, Inc.	ED	Public Service Enterprise Group Inc.	PEG
Duke Energy Corporation	DUK	Sempra Energy	SRE
Edison International	EIX	Southern Company	SO
Entergy Corporation	ETR	Wisconsin Energy Corporation	WEC
Eversource Energy	ES	Xcel Energy Inc.	XEL

Q. Does your proxy group meet the Department's criteria for establishing a risk-comparable proxy group?

A. Yes. In D.P.U. 22-22, the Department noted its preference to limit criteria to develop a broader, as opposed narrower, proxy group. My proxy group includes 26 of the 36

companies that are classified by Value Line as electric utilities, while being reasonably risk comparable to the Company.[32] Therefore, I believe that this group meets the Department's preferences as articulated in D.P.U. 22-22.

VII. Cost of Equity Estimation

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

A. The overall rate of return for a regulated utility is the weighted average cost of capital, in which the cost rates of the individual sources of capital are weighted by their respective book values. The ROE is the cost of common equity capital in the utility's capital structure for ratemaking purposes. While the costs of debt and preferred stock can be directly observed, the cost of equity is market-based and, therefore, must be estimated based on observable market data.

Q. How is the required cost of equity determined?

A. The required cost of equity is estimated by using analytical techniques that rely on market-based data to quantify investor expectations regarding equity returns, adjusted for certain incremental costs and risks. Informed judgment is then applied to determine where the company's cost of equity falls within the range of results produced by multiple analytical techniques. The key consideration in determining the cost of equity is to ensure that the

[32] NSTAR Electric Company, D.P.U. 22-22, Order, November 30, 2022, at 381.

methodologies employed reasonably reflect investors' views of the financial markets in general, as well as the subject company (in the context of the proxy group), in particular.

Q. What methods did you use to establish your recommended ROE in this proceeding?

A. I considered the results of the constant growth DCF model, multi-stage DCF model, the CAPM, the ECAPM, and the BYRP analysis. As discussed in more detail herein, a reasonable cost of equity estimate considers alternative methodologies, observable market data, and the reasonableness of their individual and collective results.

Importance of Multiple Analytical Approaches

Q. Is it important to use more than one analytical approach?

A. Yes. Because the cost of equity is not directly observable, it must be estimated based on both quantitative and qualitative information. When faced with the task of estimating the cost of equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed. Several models have been developed to estimate the cost of equity, and we use multiple approaches to estimate the cost of equity. As a practical matter, however, all the models available for estimating the cost of equity are subject to limiting assumptions or other methodological constraints. Consequently, many well-regarded finance texts recommend using multiple approaches when estimating the cost of equity. For example, Copeland, Koller, and Murrin[33] suggest using the CAPM and

[33] Copeland, Tom, Tim Koller and Jack Murrin. Valuation: Measuring and Managing the Value of Companies. New York, McKinsey & Company, Inc., 3rd Ed., 2000, at 214.

Arbitrage Pricing Theory model, while Brigham and Gapenski[34] recommend the CAPM, DCF, and BYRP approaches.

Q. Do current market conditions require the use of more than one analytical approach?

A. Yes. As discussed previously, interest rates have increased substantially over the past year from the lows seen during the COVID-19 pandemic and are expected to remain elevated over at least the next year. The benefit of using multiple models is that each model relies on different assumptions, certain of which may better reflect current and projected market conditions at different times. As discussed previously, CAPM, ECAPM, and BYRP analyses offer some balance through the use of interest rates as a direct input into the models since the effect of changes in interest rates, particularly the recent increase in interest rates, may not be captured as well in the DCF model at this time. Therefore, it is important to use multiple analytical approaches to ensure that the cost of equity results reflect market conditions that are expected during the period that the Company's rates will be in effect.

Q. Are you aware of any regulatory commissions that have recognized the importance of considering the results of multiple models?

A. Yes, several regulatory commissions consider the results of multiple cost of equity estimation methodologies such as the DCF, CAPM, and ECAPM, in determining the

[34] Brigham, Eugene and Louis Gapenski. Financial Management: Theory and Practice. Orlando, Dryden Press, 1994, at 341.

authorized ROE, including the Minnesota Public Utilities Commission ("Minnesota PUC")[35], the Michigan Public Service Commission ("Michigan PSC")[36], the Iowa Utilities Board ("IUB")[37], the Washington Utilities and Transportation Commission ("Washington UTC")[38] and the New Jersey Board of Public Utilities ("NJBPU")[39]. For example, the Washington UTC has repeatedly emphasized that it "places value on each of the methodologies used to calculate the cost of equity and does not find it appropriate to select a single method as being the most accurate or instructive."[40] The Washington UTC has also explained that "[f]inancial circumstances are constantly shifting and changing, and we welcome a robust and diverse record of evidence based on a variety of analytics and cost of capital methodologies."[41] Additionally, in its order for DTE Gas Company ("DTE Gas") in Case No. U-18999, the Michigan PSC considered the results of each of the models presented by the witnesses, which included the DCF, CAPM, and ECAPM, in the

[35] Docket No. G011/GR-17-563, Findings of Fact, Conclusions and Order, at 27; Docket No. E015/GR-16-664, Findings of Fact, Conclusions and Order, at 60-61.

[36] Michigan Public Service Commission Order, DTE Gas Company, Case No. U-18999, September 13, 2018, at 45-47.

[37] Iowa Utilities Board, Iowa-American Water Company, RPU-2016-0002, Final Decision and Order issued February 27, 2017, at 35.

[38] Washington Utilities & Transportation Commission, Docket UE-130043, Order 05, n. 89 (Dec. 4, 2013); Washington Utilities & Transportation Commission, Docket UE-100749, Order 06, ¶ 91 (March 25, 2011).

[39] NJBPU Docket No. ER12111052, OAL Docket No. PUC16310-12, Order Adopting Initial Decision with Modifications and Clarifications, March 18, 2015, at 71.

[40] Washington Utilities & Transportation Commission, Docket UE-130043, Order 05, n. 89 (Dec. 4, 2013).

[41] Washington Utilities & Transportation Commission, Docket UE-100749, Order 06, ¶ 91 (March 25, 2011).

determination of the authorized ROE.[42] The Michigan PSC also considered authorized ROEs in other states, increased volatility in capital markets and the company-specific business risks of DTE Gas.

B. Constant Growth DCF Model

Q. Please describe the DCF approach.

A. The DCF approach is based on the theory that a stock's current price represents the present value of all expected future cash flows. In its most general form, the DCF model is expressed as follows:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_\infty}{(1+k)^\infty} \qquad [1]$$

In Equation [1], P_0 represents the current stock price; D1…D∞ are all expected future dividends; and k is the discount rate, or required ROE. Equation [1] is a standard present value calculation that can be simplified and rearranged into the following form:

$$k = \frac{D_0(1+g)}{P_0} + g \qquad [2]$$

Equation [2] is often referred to as the constant growth DCF model in which the first term is the expected dividend yield and the second term, represented by *g*, is the expected long-term growth rate.

[42] Michigan Public Service Commission Order, DTE Gas Company, Case No. U-18999, September 13, 2018, at 45-47.

Q. What assumptions are required for the constant growth DCF model?

A. The constant growth DCF model requires the following assumptions: (1) a constant growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a constant price-to-earnings ratio; and (4) a discount rate greater than the expected growth rate. To the extent any of these assumptions is violated, considered judgment or specific adjustments should be applied to the results.

Q. What market data did you use to calculate the dividend yield in your constant growth DCF model?

A. The dividend yield is based on the proxy companies' current annual dividend and average closing stock prices over the 30-, 90-, and 180-trading days as of September 30, 2023.

Q. Why did you use three averaging periods for stock prices?

A. I use an average of recent trading days to calculate the price term P_0 in the DCF model to ensure that the ROE is not skewed by anomalous events that may affect stock prices on any given trading day.

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

A. Yes. Because utility companies tend to increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is reasonable to apply one-half of the expected annual dividend growth rate for purposes of calculating the expected

dividend yield component of the DCF model. This adjustment ensures that the expected first year dividend yield is, on average, representative of the coming 12-month period, and does not overstate the aggregated dividends to be paid during that time.

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

A. In its constant growth form, the DCF model in Equation [2], above, assumes a single long-term growth rate in perpetuity. To reduce the long-term growth rate to a single measure, one must assume that the dividend payout ratio remains constant and that earnings per share, dividends per share, and book value per share all grow at the same constant rate. Over the long run, however, dividend growth can be sustained only by earnings growth. Therefore, it is important to incorporate a variety of sources of long-term earnings growth rates into the constant growth DCF model.

Q. Which sources of long-term growth rates do you rely on in your constant growth DCF model?

A. My constant growth DCF model incorporates three sources of long-term earnings per share ("EPS") growth rates: (1) Zacks Investment Research ("Zacks"); (2) Yahoo! Finance; and (3) Value Line.

Q. Has the Department relied on earnings growth rates in prior decisions?

A. Yes. In D.P.U. 22-22, the Department affirmed its findings from other cases that federal regulators have mitigated systemic bias in overly optimistic stock recommendations and that the Department has accepted DCF results that rely on EPS growth rates.[43]

Q. How did you calculate the range of results for the constant growth DCF model?

A. I calculated the low-end result for the constant growth DCF model using the minimum growth rate of the three sources (i.e., the lowest of the Zacks, Yahoo Finance, and Value Line projected earnings growth rates) for each of the proxy group companies. I used a similar approach to calculate a high-end result, using the maximum growth rate of the three sources for each proxy group company. Lastly, I also calculated results using the average growth rate from all three sources for each proxy group company.

Q. Please summarize the results of your constant growth DCF analyses.

A. Figure 8, below, which is also presented in Exhibit NG-AEB-2, present the results of the constant growth DCF analyses using a 30-day, 90-day, or 180-day average for the closing stock price of the proxy groups as of September 30, 2023. As shown, the mean and median DCF results using the average growth rates range from 9.55 percent to 9.83 percent, and the mean and median results using the maximum growth rates range from 10.37 percent to 10.75 percent. While I also summarize the mean and median DCF results using the

[43] NSTAR Electric Company, D.P.U. 22-22, Order, November 30, 2022, at 386.

minimum growth rates, given the expected underperformance of utility stocks and thus the likelihood that the DCF model is understating the cost of equity, I do not believe it is appropriate to consider these DCF results at this time.

Figure 8: Summary of Constant Growth DCF Results

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	8.66%	9.78%	10.75%
90-Day Avg. Stock Price	8.52%	9.63%	10.60%
180-Day Avg. Stock Price	8.43%	9.55%	10.52%
Average	8.54%	9.65%	10.62%
Median Results:			
30-Day Avg. Stock Price	8.93%	9.83%	10.52%
90-Day Avg. Stock Price	8.80%	9.71%	10.43%
180-Day Avg. Stock Price	8.63%	9.61%	10.37%
Average	8.79%	9.72%	10.44%

C. Multi-Stage DCF Model

Q. How does the multi-stage form of the DCF model differ from the constant growth form of the DCF model?

A. As with the constant growth DCF model, the multi-stage form of the model defines the cost of equity as the discount rate that sets the current price equal to the discounted value of future cash flows. However, the multi-stage DCF model, which is an extension of the constant growth form of the DCF, enables the analyst to specify different growth rates over multiple stages. The multi-stage DCF model allows for a gradual transition from the first-

stage growth rate to the long-term growth rate, thereby avoiding the unrealistic assumption that growth changes abruptly between the first and final stages.

Q. What is the structure of your multi-stage DCF model?

A. My multi-stage DCF model sets a company's current stock price equal to the present value of future cash flows received over three "stages." In all three stages, cash flows are equal to the annual dividend payments that stockholders receive. Stage One is a short-term growth period that consists of the first five years; Stage Two is a transition period from the short-term growth period to the long-term growth period, from years 6 through 10; and Stage Three is a long-term growth period that begins in year 11 and continues in perpetuity, i.e., years 11 through 200. The cost of equity is then calculated as the rate of return that results from the initial stock investment and the dividend payments over the analytical period.

Q. What growth rates are used in your multi-stage DCF model?

A. As shown in Exhibit NG-AEB-4, I begin the multi-stage DCF model with the current annualized dividend as of September 30, 2023 for each proxy group company. In the first stage of the model, the current annualized dividend is escalated based on the average of the projected three- to five-year EPS growth rate estimates reported by Zacks, Yahoo! Finance, and Value Line. The second stage growth rate is a transition from the first stage growth rate to the long-term growth rate on a geometric average basis. For the third stage, I rely on a long-term projected Gross Domestic Product ("GDP") growth rate.

Q. How do you calculate the long-term GDP growth rate?

A. As shown in Exhibit NG-AEB-5, the long-term growth rate of 5.49 percent is based on real GDP growth rate of 3.16 percent from 1929 through 2022,[44] and a projected inflation rate of 2.26 percent. The projected inflation rate is based on three measures: (1) the consensus estimate long-term projected growth rate in the CPI of 2.20 percent, as published by Blue Chip Financial Forecasts;[45] (2) the compound annual growth rate of the CPI for all urban consumers for 2033 to 2050 of 2.27 percent, as projected by the Energy Information Administration ("EIA");[46] and (3) the compound annual growth rate of the GDP chain-type price index for 2033 to 2050 of 2.31 percent, as projected by the EIA.[47]

Q. What are the results of your multi-stage DCF models?

A. As shown in Figure 9, below, the mean and median multi-stage DCF results using the average first stage growth rate range from 9.68 percent to 10.00 percent, while the mean and median multi-stage DCF results using the maximum first stage growth rate range from 9.94 percent to 10.38 percent.

[44] U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Table 1.1.1, September 30, 2023.

[45] Blue Chip Financial Forecasts, Vol. 42, No. 6, June 1, 2023, p. 14.

[46] U.S. Energy Information Administration, Annual Energy Outlook 2023, Table 20, Macroeconomic Indicators.

[47] Id.

Figure 9: Multi-Stage DCF Results

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.64%	9.94%	10.22%
90-Day Avg. Stock Price	9.48%	9.78%	10.05%
180-Day Avg. Stock Price	9.39%	9.68%	9.94%
Average	9.50%	9.80%	10.07%
Median Results:			
30-Day Avg. Stock Price	9.61%	10.00%	10.38%
90-Day Avg. Stock Price	9.45%	9.85%	10.24%
180-Day Avg. Stock Price	9.35%	9.69%	9.99%
Average	9.47%	9.85%	10.20%

Q. Has the Department commented on the effect of market conditions on the DCF model results?

A. Yes. In D.P.U. 22-22, the Department recognized that long-term interest rates had increased and found greater certainty in that proceeding, as compared with prior decisions, that the DCF results understate the Company's cost of equity. As such, the Department considered this finding in establishing the range of reasonable results from within the analytical results presented.[48]

[48] NSTAR Electric Company, D.P.U. 22-22, Order, November 30, 2022, at 386.

D. Capital Asset Pricing Model

Q. What is the CAPM?

A. The CAPM is a risk premium approach that estimates the cost of equity for a given security as a function of a risk-free return plus a risk premium to compensate investors for the non-diversifiable or "systematic" risk of that security. Systematic risk is the risk inherent in the entire market or market segment. This form of risk cannot be diversified away using a portfolio of assets. Non-systematic risk is the risk of a specific company that can be mitigated through portfolio diversification.

The CAPM is defined by four components, each of which theoretically must be a forward-looking estimate:

$$K_e = r_f + \beta(r_m - r_f) \qquad [3]$$

Where:

K_e = the required market ROE;

β = Beta coefficient of an individual security;

r_f = the risk-free rate of return ("ROR"); and

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

In this equation, the term $(r_m - r_f)$ represents the market risk premium. According to the theory underlying the CAPM, because unsystematic risk can be diversified away, investors should only be concerned with systematic risk. Systematic risk is measured by beta, which

is a measure of the volatility of a security as compared to the market as a whole. Beta is defined as:

$$\beta = \frac{Covariance\ (r_e, r_m)}{Variance\ (r_m)} \qquad [4]$$

Variance (r_m) represents the variance of the market return, which is a measure of the uncertainty of the general market. *Covariance* (r_e, r_m) represents the covariance between the return on a specific security and the general market, which reflects the extent to which the return on that security will respond to a given change in the general market return. Thus, beta represents the risk of the security relative to the general market.

Q. What risk-free rate do you use in your CAPM analysis?

A. I rely on three sources for my estimate of the risk-free rate: (1) the current 30-day average yield on 30-year Treasury bonds of 4.42 percent;[49] (2) the projected 30-year Treasury bond yield for the first quarter of 2024 through the first quarter of 2025 of 4.16 percent;[50] and (3) the projected 30-year Treasury bond yield for 2025 through 2029 of 3.80 percent.[51]

[49] Bloomberg, as of September 30, 2023.

[50] Blue Chip Financial Forecasts, Vol. 42, No. 10, October 2, 2023, at 2.

[51] Blue Chip Financial Forecasts, Vol. 42, No. 6, June 1, 2023, at 14.

Q. What beta coefficients do you use in your CAPM analysis?

A. As shown in Exhibit NG-AEB-7, I use the current beta coefficients for the proxy group companies that are reported by Bloomberg and Value Line. The beta coefficients reported by Bloomberg are calculated using 10 years of weekly returns relative to the S&P 500 Index, and the beta coefficients reported by Value Line are calculated based on 5 years of weekly returns relative to the New York Stock Exchange Composite Index.

Additionally, as shown in Exhibit NG-AEB-7, I also consider an additional CAPM analysis that relies on the long-term average utility beta coefficient for the companies in my proxy group. The long-term average utility beta coefficient is calculated as an average of the Value Line beta coefficients for the companies in my proxy group from 2013 through 2022.

Q. How do you estimate the market risk premium in the CAPM?

A. I consider two estimates of the market risk premium: (1) the forward-looking estimate based on a projected market return on the S&P 500; and (2) a forward-looking estimate based on an estimated return on the Value Line universe of 1,700 stocks. It is my understanding that the second approach is an approach the Department requested in D.P.U. 20-120 and accepted in D.P.U. 22-22.

For the first estimate, I calculate the market risk premium as the difference between the implied expected equity market return and the risk-free rate. As shown in Exhibit NG-AEB-8, the expected return on the S&P 500 Index is calculated using the constant growth

DCF model discussed earlier in my testimony for the companies in the S&P 500 Index. Based on an estimated market capitalization-weighted dividend yield of 1.79 percent and a weighted long-term growth rate of 11.01 percent, the estimated required market return for the S&P 500 Index is 12.90 percent. I then deduct the risk-free rate from that market return, which produces a market risk premium ranging from 8.48 percent to 9.10 percent, depending on which of the three sources of the risk-free rate that is utilized.

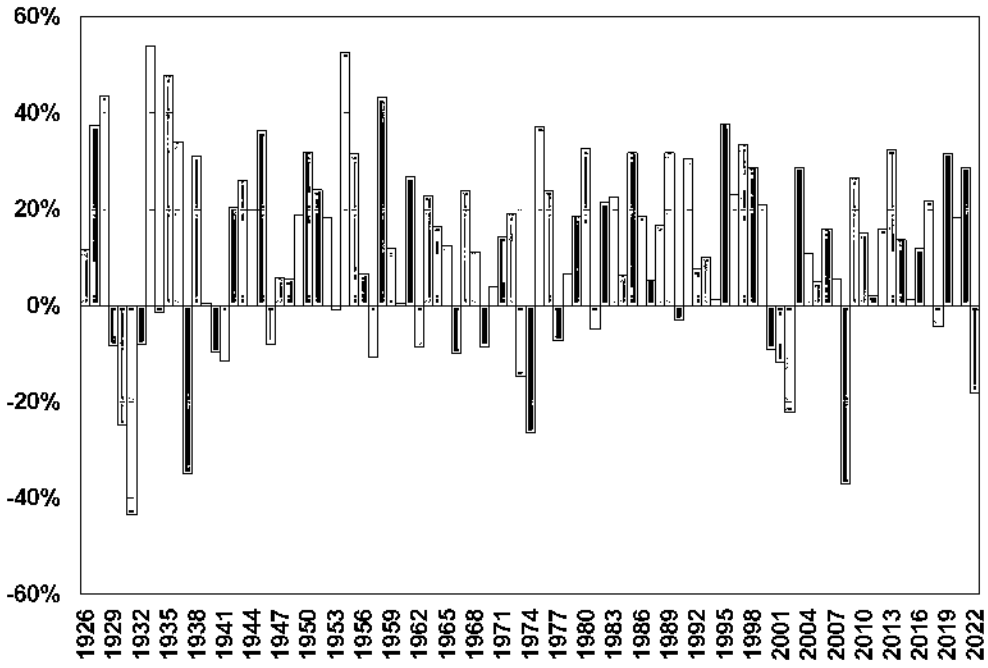
For the Department's methodology of the market risk premium, as shown in Exhibit NG-AEB-9, I estimated the market return based on the Value Line universe of 1,700 companies. In this calculation, I rely on the estimated dividend yield and estimated price appreciation potential as reported by Value Line for the universe of companies over a 13-week period from June 9, 2023 to September 29, 2023. The estimated market return is 11.71 percent. I then calculate the market risk premium by weighting the forward-looking market risk premium based on the S&P 500 Index and the forward-looking market risk premium using the universe of the stocks reported by Value Line equally at one-quarter weightings, and weight a historical market risk premium with the remaining one-half weighting. Based on the Department's preferences established in D.P.U. 22-22, I have considered a historical market risk premium that is calculated as the difference between the long-term historical market return over the period from 1929 through 2022 and the income-only return on

government bonds over the corresponding period. As shown in Exhibit NG-AEB-10, the resulting market risk premium under the Department's prior methodology is 7.84 percent.

Q. How do your estimates of the current expected market return compare to observed historical market returns?

A. Given the range of annual equity returns that have been observed over the past 96 years, as shown in Figure 10, below, current expected returns of 11.71 percent to 12.90 percent are not unreasonable. In 50 of the past 97 years, 52 percent of all observations, the realized total equity return was at least 12.90 percent.

Figure 10: Realized U.S. Equity Market Returns (1926-2022)[52]



[52] Figure 11 depicts total annual returns on large company stocks, as reported in the 2022 Kroll SBBI Yearbook.

Q. Did you consider another form of the CAPM in your analysis?

A. Yes. I have also considered the results of an ECAPM in estimating the cost of equity for the Company.[53] The ECAPM calculates the product of the adjusted beta coefficient and the market risk premium and applies a weight of 75.00 percent to that result. The model then applies a 25.00 percent weight to the market risk premium without any effect from the beta coefficient. The results of the two calculations are summed, along with the risk-free rate, to produce the ECAPM result, as noted in Equation [5] below:

$$k_e = r_f + 0.75\beta(r_m - r_f) + 0.25(r_m - r_f) \qquad [5]$$

Where:

k_e = the required market ROE
β = Adjusted beta coefficient of an individual security
r_f = the risk-free rate of return
r_m = the required return on the market as a whole

The ECAPM addresses the tendency of the "traditional" CAPM to underestimate the cost of equity for companies with low beta coefficients such as regulated utilities. In that regard, the ECAPM is not redundant to the use of adjusted betas in the traditional CAPM, but rather it recognizes the results of academic research indicating that the risk-return relationship is different, in essence, flatter than estimated by the CAPM, and that the CAPM underestimates the "alpha," or the constant return term.[54]

[53] See, e.g., Morin, Roger A. New Regulatory Finance. Public Utilities Reports, Inc., 2006, at 189.

[54] Id. at 191.

My application of the ECAPM uses the same three yields on the 30-year Treasury bonds as the risk-free rate, the same beta coefficients, and the same market risk premium estimates as in my application of the CAPM. I did not calculate an ECAPM analysis using the market risk premium derived based on the Department's methodology in D.P.U. 22-22.

Q. What are the results of your CAPM and ECAPM analyses?

A. The results of my CAPM and ECAPM analyses are shown in below in Figure 11, as well as in Exhibit NG-AEB-2.

Figure 11: Summary of CAPM and ECAPM Results

	Current 30-Day Avg 30-Year Treasury Yield	Near-Term Projected 30-Year Treasury Yield	Longer-Term Projected 30-Year Treasury Yield
Bulkley Market Return			
CAPM (Mean):			
Current Value Line Beta	12.05%	12.03%	11.99%
Current Bloomberg Beta	11.19%	11.14%	11.07%
Long-term Avg. Value Line Beta	10.79%	10.73%	10.64%
ECAPM (Mean):			
Current Value Line Beta	12.27%	12.25%	12.22%
Current Bloomberg Beta	11.62%	11.58%	11.53%
Long-term Avg. Value Line Beta	11.32%	11.27%	11.20%
Department Market Return			
CAPM (Mean):			
Current Value Line Beta			10.85%
Current Bloomberg Beta			10.06%
Long-term Avg. Value Line Beta			9.69%

E. BYRP Analysis

Q. Please describe the BYRP approach.

A. In general terms, this approach is based on the fundamental principle that equity investors bear the residual risk associated with equity ownership and, therefore, require a premium over the return they would have earned as bondholders. In other words, because returns to equity holders have greater risk than returns to bondholders, they require a higher return for that incremental risk. Thus, risk premium approaches estimate the cost of equity as the sum of the equity risk premium and the yield on a particular class of bonds. In my analysis, I use actual authorized returns for electric utilities as the historical measure of the cost of equity to determine the risk premium.

Q. What is the fundamental relationship between the equity risk premium and interest rates?

A. It is important to recognize both academic literature and market evidence indicating that the equity risk premium, as used in this approach, is inversely related to the level of interest rates - i.e., as interest rates increase, the equity risk premium decreases, and vice versa. Consequently, it is important to develop an analysis that: (1) reflects the inverse relationship between interest rates and the equity risk premium; and (2) relies on recent and expected market conditions. Such an analysis can be developed based on a regression of the risk premium as a function of Treasury bond yields. When the authorized ROEs for electric utilities serve as the measure of required equity returns and the yield on the long-

term Treasury bond is defined as the relevant measure of interest rates, the risk premium is the difference between those two points.[55]

Q. Is the BYRP analysis relevant to investors?

A. Yes. Investors are aware of authorized ROEs in other jurisdictions, and they consider those awards as a benchmark for a reasonable level of equity returns for utilities of comparable risk operating in other jurisdictions. Because my BYRP analysis is based on authorized ROEs for utility companies relative to corresponding Treasury yields, it provides relevant information to assess the return expectations of investors in the current interest rate environment.

Q. What did your BYRP analysis reveal?

A. As shown in Figure 12, below, from 1992 through September 30, 2023, there was a strong negative relationship between risk premia and interest rates. To estimate that relationship, I conducted a regression analysis using the following equation:

$$RP = a + b(T) \qquad [6]$$

Where:

RP = Risk Premium, which is the difference between allowed ROEs and the yield on 30-year U.S. Treasury bonds;

a = intercept term

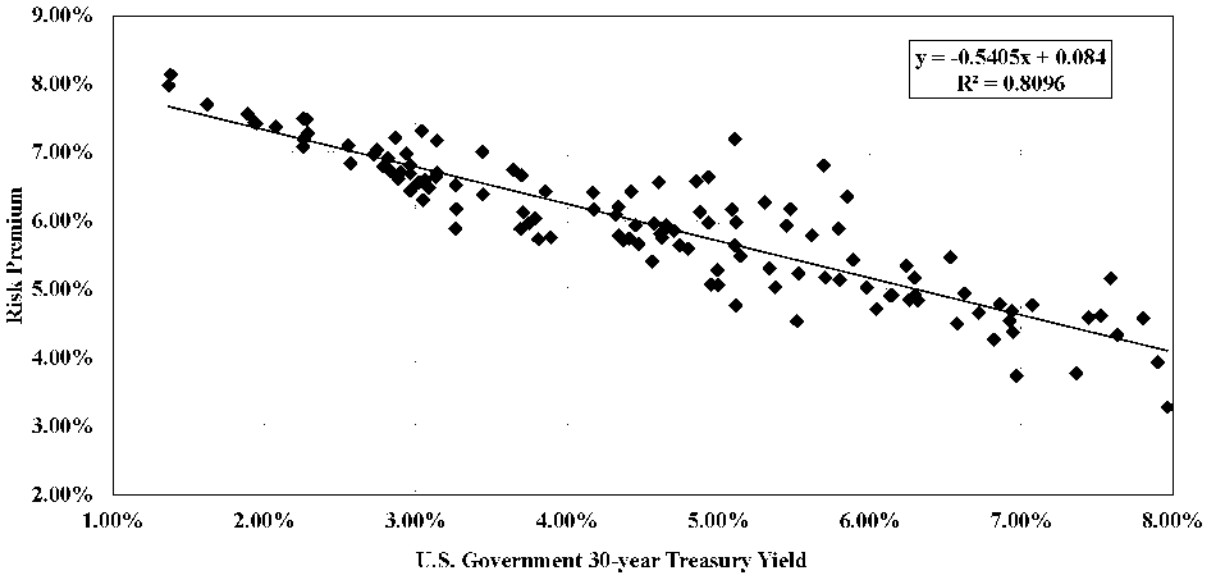
[55] See e.g., Berry, S. Keith. "Interest Rate Risk and Utility Risk Premia during 1982-93." Managerial and Decision Economics, Vol. 19, No. 2, March, 1998 (the author used a similar methodology, including using authorized ROEs as the relevant data source, and came to similar conclusions regarding the inverse relationship between risk premia and interest rates). See also Harris, Robert S. "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return." Financial Management, Spring 1986, at 66.

b = slope term

I = 30-year Treasury bond yield

Data regarding authorized ROEs were derived from more than 1,500 electric utility rate cases from 1992 through September 2023, as reported by Regulatory Research Associates ("RRA").[56] The coefficients in Equation [6] were statistically significant at the 99.00 percent level.

Figure 12: Risk Premium Results



As shown in Exhibit NG-AEB-11, based on the current 30-day average of the 30-year Treasury bond yield of 4.42 percent, the risk premium would be 6.02 percent, resulting in

[56] This analysis began with the universe of rate cases reported by S&P for electric utilities over the specified time period and was screened to eliminate limited issue rider cases, transmission-only cases, and cases that were silent with respect to the authorized ROE.

an estimated cost of equity of 10.44 percent. Based on the near-term projections of the 30-year Treasury bond yield from the first quarter of 2024 through the first quarter of 2025 of 4.16 percent, the risk premium would be 6.16 percent, resulting in an estimated cost of equity of 10.32 percent. Based on longer-term projections from 2025 through 2029 of the 30-year Treasury bond yield of 3.80 percent, the risk premium would be 6.36 percent, resulting in an estimated cost of equity of 10.16 percent.

Q. How did the results of the BYRP inform your recommended ROE for the Company?

A. I have considered the results of the BYRP analysis in establishing my recommended ROE for the Company. As noted above, investors consider the ROE authorized by a regulator when assessing the risk of that company as compared to utilities of comparable risk operating in other jurisdictions. The risk premium analysis takes into account this comparison by estimating the return expectations of investors based on the current and past ROE authorizations of electric utilities across the United States.

VIII. Regulatory and Business Risks

Q. Do the DCF, CAPM, and ECAPM results for the proxy group, taken alone, provide an appropriate estimate of the cost of equity for the Company?

A. No. These results provide only a range of the appropriate estimate of the Company's cost of equity. Several additional factors must be taken into consideration when determining where the Company's cost of equity falls within the range of results. In particular, the Company has significant capital investment plans for the period from 2024 through 2028

to meet its core system needs to provide safe and reliable electric service, and also to meet the requirements of its Electric Sector Modernization Plan ("ESMP"), as described in more detail in the pre-filed direct testimony of the CPI Plan Panel at Exhibit NG-CPIP-1. It is essential that the Company be able to access capital on reasonable terms to achieve this plan and to do so at the most reasonable cost to customers. In order to meet these objectives, the Company is proposing a Performance-Based Ratemaking ("PBR") mechanism specific to the operation and maintenance ("O&M") cost changes over a five-year rate plan period ("PBR-O mechanism") and a cost recovery mechanism to ensure that the costs to support its infrastructure, safety, reliability, and electrification ("ISRE") investments are recovered on a timely basis and that the Company can maintain strong financial metrics ("ISRE mechanism").

A. Multi-Year Rate Plan

Q. What is your understanding of the Company's proposed rate plan?

A. The Company is proposing a five-year rate plan under the CPI Plan, during which time the Company would manage its revenue and cost structure in accordance with the components of the plan. The CPI Plan is proposed to include a revised PBR-O mechanism, which adjusts based on an inflation less productivity (i.e., I-X) adjustment factor applied to only O&M components of the rates; and includes the ISRE mechanism, which is a recovery mechanism that provides for the ability to recover (1) revenue requirement for investments in core capital projects necessary to provide safe and reliable electric distribution service

to customers; and (2) the total revenue requirement for investments in capital projects necessary to execute on the ESMP, over the five-year rate period. The full rate plan is referred to as the CPI Plan.

Q. Does the Company's proposed CPI Plan mitigate the Company overall risk profile?

A. No. The CPI Plan is structured to provide an opportunity to earn the Company's allowed ROE, taking into consideration its significant capital investment plan and related components, which is a reasonable expectation of regulation. However, the CPI Plan as proposed is not entirely risk mitigating. For example, the proposed modified PBR-O mechanism reduces rates based on an O&M-only productivity factor that provides incentives to reduce costs. This offset is a benefit to customers and could be a risk to earnings if the Company is not able to achieve the productivity gains required. Further, the ROE that is being proposed in this proceeding would be fixed for the duration of the rate plan, providing stability to customers but some uncertainty for investors, as the business risks and potentially the cost of capital change over the duration of the plan.

B. Capital Expenditures

Q. Please summarize the projected capital expenditure requirements for the Company.

A. The Company is planning approximately $5.6 billion in investment for the period for FY 2024 through FY 2028, including approximately $1.4 billion in capital investments for the ESMP program and approximately $3.4 billion for ongoing capital investment in core

services, facilities, and other investments. The Company's capital plan includes expenditures to: add new customer connections; improve system operations, reliability, and resiliency; replace aging infrastructure; and modernize the grid to meet customer demands.

Q. How is the Company's risk profile affected by its substantial capital expenditure requirements?

A. As with any utility faced with substantial capital expenditure requirements, the Company's risk profile may be adversely affected in two significant and related ways: (1) the heightened level of investment increases the risk of under-recovery or delayed recovery of the invested capital; and (2) an inadequate return; which would both put downward pressure on key credit metrics.

Q. Do credit rating agencies recognize the risks associated with significant capital expenditures?

A. Yes. From a credit perspective, the additional pressure on cash flows associated with high levels of capital expenditures exerts corresponding pressure on credit metrics and, therefore, credit ratings. To that point, S&P explains the importance of regulatory support for large capital projects:

> When applicable, a jurisdiction's willingness to support large capital projects with cash during construction is an important aspect of our analysis. This is especially true when the project represents a major addition to rate base and entails long lead times and technological risks that make it susceptible to construction delays. Broad support for all capital spending is the most credit-sustaining. Support for only specific types of capital spending, such as specific environmental projects or

> system integrity plans, is less so, but still favorable for creditors. Allowance of a cash return on construction work-in-progress or similar ratemaking methods historically were extraordinary measures for use in unusual circumstances, but when construction costs are rising, cash flow support could be crucial to maintain credit quality through the spending program. Even more favorable are those jurisdictions that present an opportunity for a higher return on capital projects as an incentive to investors.[57]

Therefore, to the extent that the Company's rates do not permit the opportunity to recover its significant capital investments on a timely basis, the Company will face increased recovery risk and, therefore, increased pressure on its credit metrics.

Q. Have the credit rating agencies specifically addressed the Company's financial risk?

A. Yes. In a recent credit opinion, Moody's noted that the Company's credit metrics are "weakly positioned during the current rate plan" and noted that this is of particular concern if the number and severity of storms remains at the levels seen in the past few years. Further, Moody's noted that the material capital investment program is a credit challenge for the Company.[58]

Q. Have you conducted any analysis of the Company's projected capital expenditures relative to the proxy companies?

A. Yes. As shown in Exhibit NG-AEB-12, I compared the capital expenditures planned by the Company to the capital investment plans expected for each of the proxy group

[57] S&P Global Ratings, Ratings Direct, "Assessing U.S. Investor-Owned Utility Regulatory Environments," August 10, 2016, at 7.

[58] Moody's Investor Service. Credit Opinion. Massachusetts Electric Company. August 15, 2023, at 1-2.

companies. In order to perform this comparison, I calculated the ratio of expected capital expenditures to net utility plant for the Company and each of the companies in the proxy group by dividing each company's projected capital expenditures for the period 2024 through 2028 by its total net utility plant as of December 31, 2022. As shown in Exhibit NG-AEB-12, the Company's ratio of capital expenditures as a percentage of its net utility plant is approximately 108 percent, which is 2.02 times the median for the proxy group companies.

Q. How are capital tracking mechanisms used in utility rate making?

A. Trackers are rate mechanisms used for recovering certain operating expenses and capital investments. These are typically designed to address specific and predetermined areas of expenditure that are usually recovered either through adjustments to revenue requirements and rates, outside of rate case, or through a separate line item on customer bills. Trackers are also important in promoting policy initiatives particularly those that require substantial capital investments as the trackers award the utility the opportunity to recover the cost of the investments on an as incurred basis and thus reduce regulatory lag. For example, as I discuss in more detail below, the Company's proposed capital tracking mechanism will facilitate the clean energy transition by providing the Company a means to recover the actual costs of substantial prudent and necessary electric system investments over the term of the rate plan.

Q. What is your understanding of the Company's proposed tracking mechanism in this proceeding?

A. The Company is proposing the ISRE mechanism as part of its five-year rate plan under the CPI Plan. The ISRE mechanism would recover the investments that are necessary to support the Company's core operations to provide safe and reliable electric service, as well as the investments required to meet the Massachusetts clean energy and electrification requirements under the ESMP.

Q. Are the proxy group companies relying on capital tracking mechanisms to facilitate more timely recovery of investments?

A. Yes. As shown in Exhibit NG-AEB-13, I have reviewed the capital tracking mechanisms that are currently employed by the utility operating companies of the proxy group companies. As demonstrated in this exhibit, 69 percent of the utility operating companies owned by the proxy group entities are also employing capital tracking mechanisms to provide more timely recovery of infrastructure investments. Consequently, if approved, the presence of the ISRE mechanism, while a positive regulatory mechanism, would not reduce the Company's risk vis-à-vis that of the proxy group. However, given the relative size of the Company's investments, the absence of a capital tracking mechanism would make the Company more risky than the proxy group.

C. Performance-Based Ratemaking, Operating Cost Only

Q. Please summarize your understanding of the Company's proposed PBR-O mechanism.

A. The Company is proposing the PBR-O mechanism that would be structured to apply an inflation less productivity (i.e., I-X) adjustment factor to only O&M components of the rates. The Company proposes to rely on an inflation measure that reflects the underlying price changes in typical O&M cost categories, such as labor, supplies, and rents, to the exclusion of the capital and construction cost assumptions. The PBR-O mechanism also includes a consumer dividend.

Q. Why is the Company proposing a change in its PBR mechanism?

A. It is my understanding that the Company's current PBR formula was not structured to adequately address the financial pressures resulting from the Company's significant capital investment plan and the significant increase in inflation. The proposed PBR-O mechanism, in combination with the proposed ISRE mechanism, will provide the Company with a more reasonable and predictable opportunity to recover its necessary capital investment on a timely basis, and will allow the Company the opportunity to reflect changes in O&M costs, less the productivity offset.

Q. Has the Company been able to earn its authorized ROE under the current PBR structure?

A. No. As shown in Figure 13 below, over the most recent five-year period, the Company's average earned return has been 7.28 percent, which is 2.32 percent below its currently

authorized ROE of 9.60 percent authorized in 2019. Further, for the first quarter of 2023, the Company's earned return was 5.90 percent, or 3.70 percent lower than its currently authorized ROE. This return history supports the approval of the Company's proposed PBR-O mechanism.

Figure 13: The Company's Earned ROEs, 2019-2023

Year	Earned Return
2019	**7.8%**
2020	**10.3%**
2021	**5.3%**
2022	**7.1%**
2023 (March 31, 2023-end)	**5.9%**
Average	**7.28%**

Q. Are there Performance Mechanisms included in the Company's proposed ISRE mechanism and PBR-O mechanism?

A. Yes. As discussed in the pre-filed direct testimony of the CPI Plan Panel at Exhibit NG-CPIP-1, the proposed CPI Plan would include (1) Investment-based Performance Incentive Mechanisms ("IPIMs") to hold the Company accountable for the delivery of capital projects recovered through the ISRE mechanism; and (2) Performance Incentive

Mechanisms ("PIMs") to hold the Company accountable for operating performance enabled by the PBR-O mechanism. Both the IPIMs and PIMs are proposed to include symmetrical penalties and incentives. A specified target level would be established for each IPIM and PIM, with a symmetrical deadband around that target level in which there would be no sharing of the financial impact for Company performance within that deadband, and then equal sharing between the Company and its customers of any financial impact for outperformance or underperformance outside the deadband.

Q. Would any of the financial impact associated with the Company's performance relative to the IPIMs and PIMs be subject to the Company's existing earnings sharing mechanism?

A. No. The Company is proposing that any financial impact associated with its performance relative to the IPIMs and PIMs for the proposed ISRE mechanism and PBR-O mechanism would be excluded from the existing earnings sharing mechanism.

Q. Should the Department adjust the Company's ROE if it approves the Company's proposal to implement the PBR-O Mechanism and the ISRE Mechanism?

A. No. The Massachusetts Clean Energy and Climate Plan relies on utility investment as a cornerstone in its effort to achieve the Commonwealth's energy efficiency, environmental, and customer goals for clean energy solutions. The Company has developed robust plans to meet the Commonwealth's policy initiatives and expectations. However, as noted previously, these plans include $5.6 billion of investment over the 2024 through 2028 period. In order for the Company to be able to make these expected investments, it is

critical that the Department implement mechanisms that maintain the Company's financial strength, such that the Company can attract capital on reasonable terms. Working in partnership with the Company to provide reasonable and timely financing of its operations and investments benefits customers because it is the best possible path towards realizing the Commonwealth's clean energy goals and expectations at financing costs that benefit customers over the long-term.

D. Regulatory Framework

Q. How does the regulatory framework within which a utility operates affect investors' risk assessment?

A. The ratemaking process is premised on the principle that, for investors and companies to commit the capital needed to provide safe and reliable utility services, the subject utility must have the opportunity to recover invested capital and the market-required return on such capital. Regulatory commissions recognize that because utility operations are capital intensive, regulatory decisions should enable the utility to attract capital at reasonable terms, which balances the long-term interests of investors and customers. In that respect, the regulatory framework in which a utility operates is one of the most important factors considered in both debt and equity investors' risk assessments.

Because investors have many investment alternatives, even within a given market sector, the Company's authorized returns must be adequate on a relative basis to ensure their ability to attract capital under a variety of economic and financial market conditions. From

the perspective of debt investors, the authorized return should enable the Company to generate the cash flow needed to meet its near-term financial obligations, make the capital investments needed to maintain and expand its electric distribution system, and maintain sufficient levels of liquidity to fund unexpected events. This financial liquidity must be derived not only from internally generated funds, but also from efficient access to capital markets.

From the perspective of equity investors, the authorized return must be adequate to provide a risk-comparable return on the equity portion of the Company's capital investments. Because equity investors are the residual claimants on the Company's cash flows - meaning that debt interest must be paid prior to any equity dividends-f equity investors are particularly concerned with the regulatory framework in which a utility operates and its effect on future earnings and cash flows.

Q. How do credit rating agencies consider the regulatory framework in establishing a company's credit rating?

A. Both S&P and Moody's consider the overall regulatory framework in establishing credit ratings. Moody's establishes credit ratings based on four key factors: (1) regulatory framework; (2) the ability to recover costs and earn returns; (3) diversification; and (4) financial strength, liquidity and key financial metrics. Of these criteria, regulatory framework and the ability to recover costs and earn returns are each given a broad rating

factor of 25.00 percent. Therefore, Moody's assigns regulatory risk a 50.00 percent weighting in the overall assessment of business and financial risk for regulated utilities.[59] S&P also identifies the regulatory framework as an important factor in credit ratings for regulated utilities, stating: "[o]ne significant aspect of regulatory risk that influences credit quality is the regulatory environment in the jurisdictions in which a utility operates."[60] S&P identifies four specific factors that it uses to assess the credit implications of the regulatory environment in which investor-owned regulated utilities operate: (1) regulatory stability; (2) tariff-setting procedures and design; (3) financial stability; and (4) regulatory independence and insulation.[61]

Q. How does the regulatory environment in which a utility operates affect its access to, and cost of, capital?

A. The regulatory environment can significantly affect both the access to, and cost of, capital in several ways. First, the proportion and cost of debt capital available to utility companies are influenced by the rating agencies' assessment of the regulatory environment. As noted by Moody's: "[f]or rate regulated utilities, which typically operate as a monopoly, the regulatory environment and how the utility adapts to that environment are the most

[59] Moody's Investors Service. Rating Methodology: Regulated Electric and Gas Utilities. June 23, 2017, at 4.

[60] Standard & Poor's Global Ratings. Ratings Direct. "Assessing U.S. Investor-Owned Utility Regulatory Environments." August 10, 2016, at 2.

[61] Id.

important credit considerations."[62] Moody's further highlighted the relevance of a stable and predictable regulatory environment to a utility's credit quality, noting: "[b]roadly speaking, the Regulatory Framework is the foundation for how all the decisions that affect utilities are made (including the setting of rates), as well as the predictability and consistency of decision-making provided by that foundation."[63]

Q. Have you conducted an analysis of the regulatory environment in Massachusetts as compared with the regulatory jurisdictions where the proxy companies operate?

A. Yes. I have considered the risk that is perceived by RRA in its rankings of regulatory jurisdictions across the United States. RRA develops their ranking based on their assessment of how investors perceive the regulatory risk associated with ownership of utility securities in that jurisdiction, specifically reflecting their assessment of the probable level and quality of earnings to be realized by the state's utilities as a result of regulatory, legislative, and legal actions. RRA assigns a ranking for each regulatory jurisdiction between "Above Average/1" to "Below Average/3," with nine total rankings between these categories. I applied a numeric ranking system to the RRA rankings with "Above Average/1" assigned the highest ranking ("1") and "Below Average/3" assigned the lowest ranking ("9"). As shown in Exhibit NG-AEB-14, the Massachusetts jurisdictional ranking

62 Moody's Investors Service, Rating Methodology: Regulated Electric and Gas Utilities, June 23, 2017, at 6.

63 Id., at 7.

of "Average/2" – "5.0" is at the low end of the range established by the proxy group ranking of "Average/1 to Average/2" – "4.74" from RRA.

Q. What is your conclusion regarding the regulatory framework in Massachusetts as compared with the jurisdictions in which the proxy group companies operate?

A. As discussed, both Moody's and S&P have identified the supportiveness of the regulatory environment as an important consideration in developing their overall credit ratings for regulated utilities. Based on the comparison of the Company's proposed regulatory mechanisms and the regulatory jurisdictional rankings relative to the proxy group indicates that the current regulatory environment is reasonably supportive.

IX. Capital Structure, Cost of Debt and Preferred Equity, and Proposed Treatment of Interest Rates for Long-Term Debt Issuance

A. Capital Structure

Q. Is the capital structure of the Company an important consideration in the determination of the appropriate ROE?

A. Yes. Assuming other factors are equal, a higher debt ratio increases the risk to investors. For debt holders, higher debt ratios result in a greater portion of the available cash flow being required to meet debt service, thereby increasing the risk associated with the payments on debt. The result of increased risk is a higher interest rate. The incremental risk of a higher debt ratio is more significant for common equity shareholders, who are the residual claimants on the cash flow of the Company. Therefore, the greater the debt service requirement, the less cash flow is available for common equity holders.

Q. What is the Department's precedent with respect to establishing the capital structure for the utilities that it regulates?

A. The Department has typically deferred to the management of a utility in decisions regarding the appropriate capital structure, unless the capital structure deviates substantially from sound utility practice. In recent cases, the Department has accepted a company's test year-end capital structure, allowing for known and measurable changes.[64]

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

A. The Company is proposing a capital structure consisting of 53.48 percent common equity, 46.47 percent long-term debt, and 0.05 percent preferred stock. This capital structure considers the Company's actual consolidated capital structure, including Mass. Electric and Nantucket Electric, as of March 31, 2023, which is the end of the Test Year. The Company's adjustments to its capital structure for ratemaking purposes include: the removal of goodwill and accumulated other comprehensive income from common equity; the removal of unamortized debt issuance expenses from long-term debt; and the exclusion of debt financing for the Nantucket Electric undersea cable projects.[65] In addition the Company's consolidated capital structure is adjusted to reflect an incremental debt issuance of $400 million expected in the first quarter of calendar year 2024 and a subsequent equity injection, which reduces the equity ratio to 53.48 percent.

[64] NSTAR Electric Company, D.P.U. 22-22, Order, November 30, 2022, at 357-359.

[65] Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 18-150, at 448-449.

Q. Are the proposed adjustments to the Company's actual Test Year capital structure consistent with Department policy and precedent?

A. Yes. It would be consistent with the Department's general policy to approve the Company's proposed capital structure that reflects the planned new long-term debt issuance and equity contribution.[66] Both the long-term debt issuance planned for first quarter of 2024 and the proposed issuance of securities will be known and measurable changes before the final rate case order, which the Company expects in September 2024. Moreover, the proposed adjustments yield debt and equity ratios for ratemaking purposes that are consistent with the Company's currently authorized equity ratio and sound utility practice. The Company will provide confirmation to the Department upon final issuance of the new long-term debt and completion of the equity contribution prior to the final rate case order.

Q. What is the Company's requested overall rate of return?

A. The Company is requesting a 7.80 percent overall rate of return, as provided in Exhibit NG-AEB-17. The requested rate of return reflects the proposed capital structure just explained, an ROE of 10.50 percent, a cost of long-term debt of 4.70 percent, and a cost of preferred stock of 4.44 percent.

[66] Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 15-155, Order, September 30, 2016, at 344-346.

Q. Did you conduct any analysis to determine the reasonableness of the Company's projected equity ratio?

A. Yes. To determine the Company's proposed equity ratio, I reviewed the Company's proposed capital structure and the capital structures of the utility operating subsidiaries of the proxy companies. Because the ROE is set based on the return that is derived from the risk-comparable proxy group, it is reasonable to look to the proxy group average capital structure to benchmark the equity ratio for the Company.

Q. What is your analysis of the capital structures of the proxy group companies?

A. I calculated the mean and median proportions of common equity and long-term debt for the most recent eight quarters - third quarter of 2021 to second quarter of 2023 - for each of the companies in the proxy group. My analysis of the capital structures of the proxy group companies is provided in Exhibit NG-AEB-15. As shown in Exhibit NG-AEB-15, the equity ratios for the proxy group ranged from 41.54 percent to 66.21 percent, with a mean of 53.23 percent and a median of 53.42 percent. The Company's proposed equity ratio of 53.48 percent is consistent with the median equity ratio of the utility operating companies of the proxy group. In addition, it is generally consistent with the equity ratios approved by the Department in recent rate proceedings, including in the Company's last rate case in D.P.U. 18-150, as well as in D.P.U. 22-22.[67]

[67] Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 18-150, at 448-449; NSTAR Electric Company, D.P.U. 22-22, Order, November 30, 2022, at 359.

Q. Do you consider other factors in setting the Company's capital structure?

A. Yes. It is important to consider the challenges that the credit rating agencies have highlighted as placing pressure on the outlook for utilities in 2023. For example, while Moody's recently revised its outlook for the utility sector from "negative" to "stable," Moody's continues to note that high interest rates and increased capital spending will place pressure on credit metrics. Thus, Moody's highlights constructive regulatory outcomes that promote timely cost recovery as a key factor in supporting utility credit quality.[68]

Fitch Ratings ("Fitch") highlights similar factors as those identified by Moody's as challenging utilities' outlook for 2023, stating that the sector faces mounting cost pressures due to "elevated commodity prices, inflationary headwinds and rising interest costs," and that some offset in managing these headwinds include "higher authorized ROEs and the use of tools such as securitization of under-recovered fuel balances."[69]

Likewise, although S&P recently revised its outlook for the industry from negative to stable, S&P continues to see significant risks over the near-term for the industry as a result of inflation and increased levels of capital spending. Specifically, S&P noted:

> Despite the improvement in economic data, we expect inflation, rising interest rates, higher capital spending, and the strategic decision by many companies to operate with only minimal financial cushion from their downgrade thresholds to continue to pressure the industry's credit quality.

[68] Moody's Investors Service. "Outlook turns stable on low prices and credit-supportive regulation." September 7, 2023.

[69] Fitch Ratings. "North American Utilities, Power & Gas Outlook 2023." December 7, 2022, at 1-2.

> Throughout 2022 and so far in 2023, the Federal Reserve has consistently raised interest rates to reduce the pace of inflation. While these actions appear to have had a positive effect on slowing inflation, there's still been a modest weakening in the industry's financial measures because of inflation and rising interest rates. An environment of continuously rising costs tends to weaken the industry's financial measures because of the timing difference between when the higher costs are incurred and when they are ultimately recovered from ratepayers.[70]

The credit ratings agencies' continued concerns over the negative effects of inflation, higher interest rates, and increased capital expenditures underscore the importance of maintaining adequate cash flow metrics for the industry as a whole, and the Company in particular in the context of this proceeding.

Q. What is your conclusion regarding an appropriate equity ratio for the Company?

A. I have considered (1) the Company's significant projected capital investment plan that is necessary to meet the Company's core obligations and ESMP goals; (2) the need to maintain the Company's financial metrics, as noted by the credit rating agencies; (3) the equity ratios authorized by the Department in recent rate proceedings for other electric utilities; and (4) the actual capital structures of the proxy group operating companies. Based on all of this information, I believe that the Company's proposed common equity ratio of 53.48 percent is reasonable and appropriate. The proposed equity ratio is well within the range of equity ratios established by the capital structures of the utility operating

[70] S&P Global Ratings. "The Outlook for North American Regulated Utilities Turns Stable," May 18, 2023, at 8.

subsidiaries of the proxy companies and the equity ratios authorized by the Department. In addition, the proposed equity ratio will help the Company maintain its financial metrics as it embarks on the significant capital investment plan necessary to meet its continued core obligations and ESMP goals.

Cost of Debt and Preferred Equity

Q. How did you calculate the costs of long-term debt and preferred equity used in determining the Company's overall cost of capital?

A. The cost of debt and cost of preferred equity calculations, which are provided in Exhibit NG-AEB-16, are based on data provided by the Company.

The Company currently has one issue of preferred equity, which has an annual dividend rate of 4.44 percent.

The Company currently has three debt issuances outstanding, including: (1) an $800 million 30-year bond with an overall cost of 5.90 percent issued in November 2009; (2) a $500 million 30-year bond with an overall cost of 4.00 percent issued in August 2016; and (3) a $500 million 10-year bond with an overall cost of 1.73 percent issued in November 2020. As noted previously, the Company also projects conducting a $400 million 30-year debt issuance in first quarter of 2024 with an overall cost rate of 6.66 percent. Included in the calculation of the overall cost of the bonds are the direct coupon payments, the amortization of debt discounts or premiums, and the amortization of issuance costs where applicable. The weighted average cost of these long-term debt issuances is 4.70 percent.

Proposed Treatment of Interest Expense for New Long-Term Debt Issuances

Q. What is the Company's proposal with respect to the treatment of interest expense relative to the issuance of new long-term debt?

A. As explained in detail earlier in my testimony, interest rates have increased significantly and are expected to continue to remain relatively high in direct response to the Federal Reserve's use of monetary policy to combat inflation. At the same time, interest rates have been volatile. Interest rates are ultimately unpredictable, and changes in the capital market environment are outside the Company's control.

As noted above, the Company is planning a long-term debt issuance in February 2024 which is included in the weighted cost of debt calculation which will be updated to reflect the new issuance details once completed. However, the Company will also need to issue additional debt over the course of the proposed five-year rate plan to fund its capital investments. Any debt issuance will be accompanied by a large capital infusion; however, corporate debt rates are currently higher than the Company's proposed weighted average cost of debt and the Company is also concerned about elevated rate volatility.

To address the anticipated volatility, the Company is proposing that the Department allow the Company to submit a filing with the Department, pursuant to an Incurred Debt Recovery Factor ("IDRF"), to request adjustments to revenue to reflect significant increases or decreases in incurred interest rate expense that materially impacts the Company's weighted average cost of capital during the five-year term of the CPI plan.

Predicting interest rates so far in advance of a debt issuance is challenging given the recent volatility. However, if the Company's proposed multi-year rate plan is approved in this proceeding, the Company will be locked into the parameters of the five-year rate plan with no recourse to address potential substantial and unpredictable swings in interest rates that would affect these long-term debt issuances. Therefore, the Company seeks the opportunity to request approval to recover incurred debt expense in the event that significant changes in interest rates occur over the five-year term of the CPI Plan causing a material impact on actual interest expense, upward or downward, outside a certain threshold.

Q. How would the proposed treatment for interest rates on long-term debt offerings work under the IDRF?

A. As defined in the CPI Plan Panel's testimony in Exhibit NG-CPIP-1, the Company is proposing the same definition of exogenous costs as ordered in D.P.U 18-150. The IDRF would work in a similar manner as a separate factor to address interest rate costs on new long-term debt. The Company would file for a revenue adjustment for interest expense, which would be subject to Department review and approval.

Under the IDRF, the difference between actual debt expense and regulatory allowed debt expense would be checked against the same exogenous cost significance threshold as the Z Factor, or $3.6 million with annual adjustments for inflation. Therefore, in a given rate year, if actual debt expense exceeds the Company's allowed debt expense by more than the

significance threshold, the Company could file for recovery of the additional expense. Conversely, if actual debt expense is lower than the Company's allowed debt expense by more than the same threshold amount, the Company would file to return the excess revenue to customers.

Q. Why would the IDRF be appropriate for the Company's long-term debt offerings?

A. As explained earlier in my testimony, there has been significant volatility in long-term interest rates over the past few years. For example, the 30-year Treasury yield fell by nearly 120 basis points in 2019, and then has increased approximately five-fold from a low of 0.99 percent in March of 2020 to a current high near 5.00 percent as of mid-October 2023. The volatility in interest rates increases the likelihood that actual cost of debt for future debt issuances will be either lower or higher than the approved weighted average cost of debt in this proceeding. The Company strives to issue debt at the most opportune times and in the most efficient manner. However, interest rates are set by the market, with the influence of the Federal Reserve, and the Company has no control over those rates. The opportunity to address future swings in the interest rates would protect customers from paying too much related to the Company's long-term debt costs if interest rates decrease significantly, and likewise would protect the Company if interest rates increase significantly relative to the cost of debt included in rates established in this proceeding. In this way, neither customers nor the Company would be disadvantaged for reasons outside of their control.

X. Conclusions and Recommendations

Q. What is your conclusion regarding a fair ROE for the Company?

A. Figure 14, below, summarizes the results of my cost of equity analyses. Based on the quantitative and qualitative analyses presented in my direct testimony, the business and financial risks of the Company as compared to the proxy group, and current and prospective capital market conditions, I recommend an ROE of 10.50 percent for the Company. The cost of capital, when considered in the context of the overall rate request, is expected to enable the Company to maintain its financial integrity and, therefore, its ability to attract capital at reasonable rates under a variety of economic and financial market conditions, while continuing to provide safe, reliable, and affordable electric utility service to customers in Massachusetts.

Figure 14: Summary of Analytical Results

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	8.66%	9.78%	10.75%
90-Day Avg. Stock Price	8.52%	9.63%	10.60%
180-Day Avg. Stock Price	8.43%	9.55%	10.52%
Average	8.54%	9.65%	10.62%
Median Results:			
30-Day Avg. Stock Price	8.93%	9.83%	10.52%
90-Day Avg. Stock Price	8.80%	9.71%	10.43%
180-Day Avg. Stock Price	8.63%	9.61%	10.37%
Average	8.79%	9.72%	10.44%

Multi Stage DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.64%	9.94%	10.22%
90-Day Avg. Stock Price	9.48%	9.78%	10.05%
180-Day Avg. Stock Price	9.39%	9.68%	9.94%
Average	9.50%	9.80%	10.07%
Median Results:			
30-Day Avg. Stock Price	9.61%	10.00%	10.38%
90-Day Avg. Stock Price	9.45%	9.85%	10.24%
180-Day Avg. Stock Price	9.35%	9.69%	9.99%
Average	9.47%	9.85%	10.20%

CAPM / ECAPM / Bond Yield Risk Premium

	Current 30-Day Avg 30-Year Treasury Yield	Near-Term Projected 30-Year Treasury Yield	Longer-Term Projected 30-Year Treasury Yield
Bulkley Market Return			
CAPM (Mean):			
Current *Value Line* Beta	12.05%	12.03%	11.99%
Current Bloomberg Beta	11.19%	11.14%	11.07%
Long-term Avg. *Value Line* Beta	10.79%	10.73%	10.64%
ECAPM (Mean):			
Current *Value Line* Beta	12.27%	12.25%	12.22%
Current Bloomberg Beta	11.62%	11.58%	11.53%
Long-term Avg. *Value Line* Beta	11.32%	11.27%	11.20%
Department Market Return			
CAPM (Mean):			
Current *Value Line* Beta			10.85%
Current Bloomberg Beta			10.06%
Long-term Avg. *Value Line* Beta			9.69%
Bond Yield Risk Premium:	10.44%	10.32%	10.16%

Q. Does this conclude your direct testimony?

Yes.

Ann E. Bulkley

PRINCIPAL

Boston 508.981.0866 Ann.Bulkley@brattle.com

With more than 25 years of experience in the energy industry, Ms. Bulkley specializes in regulatory economics for the electric and natural gas and water utility sectors, including valuation of regulated and unregulated utility assets, cost of capital, and capital structure issues.

Ms. Bulkley has extensive state and federal regulatory experience, and she has provided expert testimony on the cost of capital in nearly 100 regulatory proceedings before 32 state regulatory commissions and the Federal Energy Regulatory Commission (FERC).

In addition to her regulatory experience, Ms. Bulkley has provided valuation and appraisal services for a variety of purposes, including the sale or acquisition of utility assets, regulated ratemaking, ad valorem tax disputes, and other litigation purposes. In addition, she has experience in the areas of contract and business unit valuation, strategic alliances, market restructuring, and regulatory and litigation support.

Ms. Bulkley is a Certified General Appraiser licensed in the Commonwealth of Massachusetts and the State of New Hampshire.

Prior to joining Brattle, Ms. Bulkley was a Senior Vice President at an economic consultancy and held senior positions at several other consulting firms.

AREAS OF EXPERTISE

- Regulatory Economics, Finance & Rates
- Regulatory Investigations & Enforcement
- Tax Controversy & Transfer Pricing
- Electricity Litigation & Regulatory Disputes

M&A Litigation

EDUCATION

- **Boston University**
  MA in Economics
- **Simmons College**
  BA in Economics and Finance

PROFESSIONAL EXPERIENCE

- **The Brattle Group (2022–Present)**
  Principal
- **Concentric Energy Advisors, Inc. (2002–2021)**
  Senior Vice President
  Vice President
  Assistant Vice President
  Project Manager
- **Navigant Consulting, Inc. (1997–2002)**
  Project Manager
- **Reed Consulting Group (1995-1997)**
  Consultant- Project Manager
- **Cahners Publishing Company (1995)**
  Economist

SELECTED CONSULTING EXPERIENCE & EXPERT TESTIMONY

REGULATORY ANALYSIS AND RATEMAKING

Have provided a range of advisory services relating to regulatory policy analysis and many aspects of utility ratemaking, with specific services including:

- Cost of capital and return on equity testimony, cost of service and rate design analysis and testimony, development of ratemaking strategies
- Development of merchant function exit strategies
- Analysis and program development to address residual energy supply and/or provider of last resort obligations
- Stranded costs assessment and recovery
  Performance-based ratemaking analysis and design
- Many aspects of traditional utility ratemaking (e.g., rate design, rate base valuation)

COST OF CAPITAL

Have provided expert testimony on the cost of capital and capital structure in nearly 100 regulatory proceedings before state and federal regulatory commissions in the United States.

RATEMAKING

Have assisted several clients with analysis to support investor-owned and municipal utility clients in the preparation of rate cases. Sample engagements include:

- Assisted several investor-owned and municipal clients on cost allocation and rate design issues including the development of expert testimony supporting recommended rate alternatives.
- Worked with Canadian regulatory staff to establish filing requirements for a rate review of a newly regulated electric utility. Along with analyzing and evaluating rate application, attended hearings and conducted investigation of rate application for regulatory staff. And prepared, supported, and defended recommendations for revenue requirements and rates for the company. Additionally, developed rates for gas utility for transportation program and ancillary services.

VALUATION

Have provided valuation services to utility clients, unregulated generators, and private equity clients for a variety of purposes, including ratemaking, fair value, ad valorem tax, litigation and

damages, and acquisition. Appraisal practices are consistent with the national standards established by the Uniform Standards of Professional Appraisal Practice.

Representative projects/clients have included:

- Prepared appraisals of electric utility transmission and distribution assets for ad valorem tax purposes.
- Prepared appraisals of hydroelectric generating facilities for ad valorem tax purposes.
- Conducted appraisals of fossil fuel generating facilities for ad valorem tax purposes.
- Conducted appraisals of generating assets for the purposes of unwinding sale-leaseback agreements.
- For a confidential utility client, prepared valuation of fossil and nuclear generation assets for financing purposes for regulated utility client.
- Conducted a strategic review of the acquisition of nuclear generation assets. Review included the evaluation of the operating costs of the facilities and the long-term liabilities associated with the assets including the decommissioning of the assets.
- Prepared a valuation of a portfolio of generation assets for a large energy utility to be used for strategic planning purposes. Valuation approach included an income approach, a real options analysis, and a risk analysis.
- Assisted clients in the restructuring of NUG contracts through the valuation of the underlying assets. Performed analysis to determine the option value of a plant in a competitively priced electricity market following the settlement of the NUG contract.
- Prepared market valuations of several purchase power contracts for large electric utilities in the sale of purchase power contracts. Assignment included an assessment of the regional power market, analysis of the underlying purchase power contracts, and a traditional discounted cash flow valuation approach, as well as a risk analysis. Analyzed bids from potential acquirers using income and risk analysis approached. Prepared an assessment of the credit issues and value at risk for the selling utility.
- Prepared appraisal of a portfolio of generating facilities for a large electric utility to be used for financing purposes.

- Conducted a valuation of regulated utility assets for the fair value rate base estimate used in electric rate proceedings in Indiana.
- Prepared an appraisal of a fleet of fossil generating assets for a large electric utility to establish the value of assets transferred from utility property.
- Conducted due diligence on an electric transmission and distribution system as part of a buy-side due diligence team.
- Provided analytical support and prepared testimony regarding the valuation of electric distribution system assets in five communities in a condemnation proceeding.
- Prepared feasibility reports analyzing the expected net benefits resulting from municipal ownership of investor-owned utility operations.
- Prepared independent analyses of proposal for the proposed government condemnation of the investor-owned utilities in Maine and the formation of a public power district.
- Valued purchase power agreements in the transfer of assets to a deregulated electric market.

STRATEGIC AND FINANCIAL ADVISORY SERVICES

Have assisted several clients across North America with analytically-based strategic planning, due diligence, and financial advisory services.

Representative projects include:

- Preparation of feasibility studies for bond issuances for municipal and district steam clients.
- Assisted in the development of a generation strategy for an electric utility. Analyzed various NERC regions to identify potential market entry points. Evaluated potential competitors and alliance partners. Assisted in the development of gas and electric price forecasts. Developed a framework for the implementation of a risk management program.
- Assisted clients in identifying potential joint venture opportunities and alliance partners. Contacted interviewed and evaluated potential alliance candidates based on company-established criteria for several LDCs and marketing companies. Worked with several LDCs and unregulated marketing companies to establish alliances to enter into the retail energy

market. Prepared testimony in support of several merger cases and participated in the regulatory process to obtain approval for these mergers.

- Assisted clients in several buy-side due diligence efforts, providing regulatory insight and developing valuation recommendations for acquisitions of both electric and gas properties.

BULKLEY TESTIMONY LISTING

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Arizona Corporation Commission				
UNS Electric	11/22	UNS Electric	Docket No. E-04204A-15-0251	Return on Equity
Tucson Electric Power Company	6/22	Tucson Electric Power Company	Docket No. G-01933A-22-0107	Return on Equity
Southwest Gas Corporation	12/21	Southwest Gas Corporation	Docket No. G-01551A-21-0368	Return on Equity
Arizona Public Service Company	10/19	Arizona Public Service Company	Docket No. E-01345A-19-0236	Return on Equity
Tucson Electric Power Company	04/19	Tucson Electric Power Company	Docket No. E-01933A-19-0028	Return on Equity
Tucson Electric Power Company	11/15	Tucson Electric Power Company	Docket No. E-01933A-15-0322	Return on Equity
UNS Electric	05/15	UNS Electric	Docket No. E-04204A-15-0142	Return on Equity
UNS Electric	12/12	UNS Electric	Docket No. E-04204A-12-0504	Return on Equity
Arkansas Public Service Commission				

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Oklahoma Gas and Electric Co	10/21	Oklahoma Gas and Electric Co	Docket No. D-18-046-FR	Return on Equity
Arkansas Oklahoma Gas Corporation	10/13	Arkansas Oklahoma Gas Corporation	Docket No. 13-078-U	Return on Equity
California Public Utilities Commission				
PacifiCorp, d/b/a Pacific Power	5/22	PacifiCorp, d/b/a Pacific Power	Docket No. A-22-05-006	Return on Equity
San Jose Water Company	05/21	San Jose Water Company	A2105004	Return on Equity
Colorado Public Utilities Commission				
Public Service Company of Colorado	11/22	Public Service Company of Colorado	Docket No. 22AL-0530E	Return on Equity
Public Service Company of Colorado	01/22	Public Service Company of Colorado	Docket No. 22AL-0046G	Return on Equity
Public Service Company of Colorado	07/21	Public Service Company of Colorado	21AL-0317E	Return on Equity
Public Service Company of Colorado	02/20	Public Service Company of Colorado	20AL-0049G	Return on Equity
Public Service Company of Colorado	05/19	Public Service Company of Colorado	19AL-0268E	Return on Equity
Public Service Company of Colorado	01/19	Public Service Company of Colorado	19AL-0063ST	Return on Equity
Atmos Energy Corporation	05/15	Atmos Energy Corporation	Docket No. 15AL-0299G	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Atmos Energy Corporation	04/14	Atmos Energy Corporation	Docket No. 14AL-0300G	Return on Equity
Atmos Energy Corporation	05/13	Atmos Energy Corporation	Docket No. 13AL-0496G	Return on Equity
Connecticut Public Utilities Regulatory Authority				
United Illuminating	09/22	United Illuminating	Docket No. 22-08-08	Return on Equity
United Illuminating	05/21	United Illuminating	Docket No. 17-12-03RE11	Return on Equity
Connecticut Water Company	01/21	Connecticut Water Company	Docket No. 20-12-30	Return on Equity
Connecticut Natural Gas Corporation	06/18	Connecticut Natural Gas Corporation	Docket No. 18-05-16	Return on Equity
Yankee Gas Services Co. d/b/a Eversource Energy	06/18	Yankee Gas Services Co. d/b/a Eversource Energy	Docket No. 18-05-10	Return on Equity
The Southern Connecticut Gas Company	06/17	The Southern Connecticut Gas Company	Docket No. 17-05-42	Return on Equity
The United Illuminating Company	07/16	The United Illuminating Company	Docket No. 16-06-04	Return on Equity
Federal Energy Regulatory Commission				
Sea Robin Pipeline	12/22	Sea Robin Pipeline	Docket No. RP22-___	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Northern Natural Gas Company	07/22	Northern Natural Gas Company	Docket No. RP22-___	Return on Equity
Transwestern Pipeline Company, LLC	07/22	Transwestern Pipeline Company, LLC	Docket No. RP22-___	Return on Equity
Florida Gas Transmission	02/21	Florida Gas Transmission	Docket No. RP21-441	Return on Equity
TransCanyon	01/21	TransCanyon	Docket No. ER21-1065	Return on Equity
Duke Energy	12/20	Duke Energy	Docket No. EL21-9-000	Return on Equity
Wisconsin Electric Power Company	08/20	Wisconsin Electric Power Company	Docket No. EL20-57-000	Return on Equity
Panhandle Eastern Pipe Line Company, LP	10/19	Panhandle Eastern Pipe Line Company, LP	Docket Nos. RP19-78-000 RP19-78-001	Return on Equity
Panhandle Eastern Pipe Line Company, LP	08/19	Panhandle Eastern Pipe Line Company, LP	Docket Nos. RP19-1523	Return on Equity
Sea Robin Pipeline Company LLC	11/18	Sea Robin Pipeline Company LLC	Docket# RP19-352-000	Return on Equity
Tallgrass Interstate Gas Transmission	10/15	Tallgrass Interstate Gas Transmission	RP16-137	Return on Equity
Idaho Public Utilities Commission				
Intermountain Gas Co	12/22	Intermountain Gas Co	C-INT-G-22-07	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
PacifiCorp d/b/a Rocky Mountain Power	05/21	PacifiCorp d/b/a Rocky Mountain Power	Case No. PAC-E-21-07	Return on Equity
Illinois Commerce Commission				
Peoples Gas Light & Coke Company	01/23	Peoples Gas Light & Coke Company	D-23-0069	Return on Equity
North Shore Gas Company	01/23	North Shore Gas Company	D-23-0068	Return on Equity
Illinois American Water	02/22	Illinois American Water	Docket No. 22-0210	Return on Equity
North Shore Gas Company	02/21	North Shore Gas Company	No. 20-0810	Return on Equity
Indiana Utility Regulatory Commission				
Indiana American Water Company	03/23	Indiana and Michigan American Water Company	IURC Cause No. 45870	Return on Equity
Indiana Michigan Power Co.	07/21	Indiana Michigan Power Co.	IURC Cause No. 45576	Return on Equity
Indiana Gas Company Inc.	12/20	Indiana Gas Company Inc.	IURC Cause No. 45468	Return on Equity
Southern Indiana Gas and Electric Company	10/20	Southern Indiana Gas and Electric Company	IURC Cause No. 45447	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Indiana and Michigan American Water Company	09/18	Indiana and Michigan American Water Company	IURC Cause No. 45142	Return on Equity
Indianapolis Power and Light Company	12/17	Indianapolis Power and Light Company	Cause No. 45029	Fair Value
Northern Indiana Public Service Company	09/17	Northern Indiana Public Service Company	Cause No. 44988	Fair Value
Indianapolis Power and Light Company	12/16	Indianapolis Power and Light Company	Cause No.44893	Fair Value
Northern Indiana Public Service Company	10/15	Northern Indiana Public Service Company	Cause No. 44688	Fair Value
Indianapolis Power and Light Company	09/15	Indianapolis Power and Light Company	Cause No. 44576 Cause No. 44602	Fair Value
Kokomo Gas and Fuel Company	09/10	Kokomo Gas and Fuel Company	Cause No. 43942	Fair Value
Northern Indiana Fuel and Light Company, Inc.	09/10	Northern Indiana Fuel and Light Company, Inc.	Cause No. 43943	Fair Value
Iowa Department of Commerce Utilities Board				
MidAmerican Energy Company	06/23	MidAmerican Energy Company	Docket No. RPU-2023-___	Return on Equity
MidAmerican Energy Company	01/22	MidAmerican Energy Company	Docket No. RPU-2022-0001	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Iowa-American Water Company	08/20	Iowa-American Water Company	Docket No. RPU-2020-0001	Return on Equity
Kansas Corporation Commission				
Evergy Kansas	04/23	Evergy Kansas	Docket No. 23-_____-_____-RTS	Return on Equity
Atmos Energy Corporation	08/15	Atmos Energy Corporation	Docket No. 16-ATMG-079-RTS	Return on Equity
Kentucky Public Service Commission				
Kentucky American Water Company	06/23	Kentucky American Water Company	Docket No. 2023-____	Return on Equity
Kentucky American Water Company	11/18	Kentucky American Water Company	Docket No. 2018-00358	Return on Equity
Maine Public Utilities Commission				
Central Maine Power	08/22	Central Maine Power	Docket No. 2022-00152	Return on Equity
Central Maine Power	10/18	Central Maine Power	Docket No. 2018-194	Return on Equity
Maryland Public Service Commission				
Maryland American Water Company	06/18	Maryland American Water Company	Case No. 9487	Return on Equity
Massachusetts Appellate Tax Board				
Hopkinton LNG Corporation	03/20	Hopkinton LNG Corporation	Docket No.	Valuation of LNG Facility

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
FirstLight Hydro Generating Company	06/17	FirstLight Hydro Generating Company	Docket No. F-325471 Docket No. F-325472 Docket No. F-325473 Docket No. F-325474	Valuation of Electric Generation Assets
Massachusetts Department of Public Utilities				
National Grid USA	11/20	Boston Gas Company	DPU 20-120	Return on Equity
Berkshire Gas Company	05/18	Berkshire Gas Company	DPU 18-40	Return on Equity
Unitil Corporation	01/04	Fitchburg Gas and Electric	DTE 03-52	Integrated Resource Plan; Gas Demand Forecast
Michigan Public Service Commission				
Indiana Michigan Power Co.	09/23	Indiana Michigan Power Co.	Case No. U-21461	Return on Equity
Michigan Gas Utilities Corporation	03/23	Michigan Gas Utilities Corporation	Case No. U-21366	Return on Equity
Michigan Gas Utilities Corporation	03/21	Michigan Gas Utilities Corporation	Case No. U-20718	Return on Equity
Wisconsin Electric Power Company	12/11	Wisconsin Electric Power Company	Case No. U-16830	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Michigan Tax Tribunal				
New Covert Generating Co., LLC.	03/18	The Township of New Covert Michigan	MTT Docket No. 000248TT and 16-001888-TT	Valuation of Electric Generation Assets
Covert Township	07/14	New Covert Generating Co., LLC.	Docket No. 399578	Valuation of Electric Generation Assets
Minnesota Public Utilities Commission				
ALLETE, Inc. d/b/a Minnesota Power	11/23	Allete, Inc. d/b/a Minnesota Power	D-E-015/GR-23-155	Return on Equity
CenterPoint Energy Resources	11/23	CenterPoint Energy Resources	D-G-008/GR-23-173	Return on Equity
Minnesota Energy Resources Corporation	11/22	Minnesota Energy Resources Corporation	Docket No. G011/GR-22-504	Return on Equity
CenterPoint Energy Resources	11/21	CenterPoint Energy Resources	D-G-008/GR-21-435	Return on Equity
ALLETE, Inc. d/b/a Minnesota Power	11/21	Allete, Inc. d/b/a Minnesota Power	D-E-015/GR-21-630	Return on Equity
Otter Tail Power Company	11/20	Otter Tail Power Company	E017/GR-20-719	Return on Equity
ALLETE, Inc. d/b/a Minnesota Power	11/19	Allete, Inc. d/b/a Minnesota Power	E015/GR-19-442	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
CenterPoint Energy Resources Corporation d/b/a CenterPoint Energy Minnesota Gas	10/19	CenterPoint Energy Resources Corporation d/b/a CenterPoint Energy Minnesota Gas	G-008/GR-19-524	Return on Equity
Great Plains Natural Gas Co.	09/19	Great Plains Natural Gas Co.	Docket No. G004/GR-19-511	Return on Equity
Minnesota Energy Resources Corporation	10/17	Minnesota Energy Resources Corporation	Docket No. G011/GR-17-563	Return on Equity
Missouri Public Service Commission				
Ameren Missouri	08/22	Ameren Missouri	File No. ER-2022-0337	Return on Equity
Missouri American Water Company	07/22	Missouri American Water Company	Case No. WR-2022-0303 Case No. SR-2022-0304	Return on Equity
Evergy Missouri West	1/22	Evergy Missouri West	File No. ER-2022-0130	Return on Equity
Evergy Missouri Metro	1/22	Evergy Missouri Metro	File No. ER-2022-0129	Return on Equity
Ameren Missouri	03/21	Ameren Missouri	Docket No. ER-2021-0240 Docket No. GR-2021-0241	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Missouri American Water Company	06/20	Missouri American Water Company	Case No. WR-2020-0344 Case No. SR-2020-0345	Return on Equity
Missouri American Water Company	06/17	Missouri American Water Company	Case No. WR-17-0285 Case No. SR-17-0286	Return on Equity
Montana Public Service Commission				
Montana-Dakota Utilities Co.	11/22	Montana-Dakota Utilities Co.	D2022.11.099	Return on Equity
Montana-Dakota Utilities Co.	06/20	Montana-Dakota Utilities Co.	D2020.06.076	Return on Equity
Montana-Dakota Utilities Co.	09/18	Montana-Dakota Utilities Co.	D2018.9.60	Return on Equity
New Hampshire - Board of Tax and Land Appeals				
Liberty Utilities (EnergyNorth Natural Gas)	07/23	Liberty Utilities (EnergyNorth Natural Gas)	Docket No. DG 23-067	Return on Equity
Liberty Utilities (Granite State Electric)	05/23	Liberty Utilities (Granite State Electric)	Docket No. DE 23-039	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Public Service Company of New Hampshire d/b/a Eversource Energy	11/19 12/19	Public Service Company of New Hampshire d/b/a Eversource Energy	Master Docket No. 28873-14-15-16-17PT	Valuation of Utility Property and Generating Assets
New Hampshire Public Utilities Commission				
Public Service Company of New Hampshire	05/19	Public Service Company of New Hampshire	DE-19-057	Return on Equity
New Hampshire-Merrimack County Superior Court				
Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	04/18	Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	220-2012-CV-1100	Valuation of Utility Property
New Hampshire-Rockingham Superior Court				
Eversource Energy	05/18	Public Service Commission of New Hampshire	218-2016-CV-00899 218-2017-CV-00917	Valuation of Utility Property
New Jersey Board of Public Utilities				
New Jersey American Water Company, Inc.	01/22	New Jersey American Water Company, Inc.	WR22010019	Return on Equity
Public Service Electric and Gas Company	10/20	Public Service Electric and Gas Company	EO18101115	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
New Jersey American Water Company, Inc.	12/19	New Jersey American Water Company, Inc.	WR19121516	Return on Equity
Public Service Electric and Gas Company	04/19	Public Service Electric and Gas Company	EO18060629 GO18060630	Return on Equity
Public Service Electric and Gas Company	02/18	Public Service Electric and Gas Company	GR17070776	Return on Equity
Public Service Electric and Gas Company	01/18	Public Service Electric and Gas Company	ER18010029 GR18010030	Return on Equity
New Mexico Public Regulation Commission				
Southwestern Public Service Company	07/19	Southwestern Public Service Company	19-00170-UT	Return on Equity
Southwestern Public Service Company	10/17	Southwestern Public Service Company	Case No. 17-00255-UT	Return on Equity
Southwestern Public Service Company	12/16	Southwestern Public Service Company	Case No. 16-00269-UT	Return on Equity
Southwestern Public Service Company	10/15	Southwestern Public Service Company	Case No. 15-00296-UT	Return on Equity
Southwestern Public Service Company	06/15	Southwestern Public Service Company	Case No. 15-00139-UT	Return on Equity
New York State Department of Public Service				
Liberty Utilities (New York Water)	5/23	Liberty Utilities (New York Water)	Case 23-W-0235	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
New York State Electric and Gas Company Rochester Gas and Electric	05/22	New York State Electric and Gas Company Rochester Gas and Electric	22-E-0317 22-G-0318 22-E-0319 22-G-0320	Return on Equity
Corning Natural Gas Corporation	07/21	Corning Natural Gas Corporation	Case No. 21-G-0394	Return on Equity
Central Hudson Gas and Electric Corporation	08/20	Central Hudson Gas and Electric Corporation	Electric 20-E-0428 Gas 20-G-0429	Return on Equity
Niagara Mohawk Power Corporation	07/20	National Grid USA	Case No. 20-E-0380 20-G-0381	Return on Equity
Corning Natural Gas Corporation	02/20	Corning Natural Gas Corporation	Case No. 20-G-0101	Return on Equity
New York State Electric and Gas Company Rochester Gas and Electric	05/19	New York State Electric and Gas Company Rochester Gas and Electric	19-E-0378 19-G-0379 19-E-0380 19-G-0381	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Brooklyn Union Gas Company d/b/a National Grid NY KeySpan Gas East Corporation d/b/a National Grid	04/19	Brooklyn Union Gas Company d/b/a National Grid NY KeySpan Gas East Corporation d/b/a National Grid	19-G-0309 19-G-0310	Return on Equity
Central Hudson Gas and Electric Corporation	07/17	Central Hudson Gas and Electric Corporation	Electric 17-E-0459 Gas 17-G-0460	Return on Equity
Niagara Mohawk Power Corporation	04/17	National Grid USA	Case No. 17-E-0238 17-G-0239	Return on Equity
Corning Natural Gas Corporation	06/16	Corning Natural Gas Corporation	Case No. 16-G-0369	Return on Equity
National Fuel Gas Company	04/16	National Fuel Gas Company	Case No. 16-G-0257	Return on Equity
KeySpan Energy Delivery	01/16	KeySpan Energy Delivery	Case No. 15-G-0058 Case No. 15-G-0059	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
New York State Electric and Gas Company Rochester Gas and Electric	05/15	New York State Electric and Gas Company Rochester Gas and Electric	Case No. 15-E-0283 Case No. 15-G-0284 Case No. 15-E-0285 Case No. 15-G-0286	Return on Equity
North Dakota Public Service Commission				
Montana-Dakota Utilities Co.	05/22	Montana-Dakota Utilities Co.	C-PU-22-194	Return on Equity
Montana-Dakota Utilities Co.	08/20	Montana-Dakota Utilities Co.	C-PU-20-379	Return on Equity
Northern States Power Company	12/12	Northern States Power Company	C-PU-12-813	Return on Equity
Northern States Power Company	12/10	Northern States Power Company	C-PU-10-657	Return on Equity
Oklahoma Corporation Commission				
Oklahoma Gas & Electric	12/21	Oklahoma Gas & Electric	Cause No. PUD 202100164	Return on Equity
Arkansas Oklahoma Gas Corporation	01/13	Arkansas Oklahoma Gas Corporation	Cause No. PUD 201200236	Return on Equity
Oregon Public Service Commission				
PacifiCorp d/b/a Pacific Power & Light	03/22	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-399	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
PacifiCorp d/b/a Pacific Power & Light	02/20	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-374	Return on Equity
Pennsylvania Public Utility Commission				
American Water Works Company Inc.	04/22	Pennsylvania-American Water Company	Docket No. R-2020-3031672 (water) Docket No. R-2020-3031673 (wastewater)	Return on Equity
American Water Works Company Inc.	04/20	Pennsylvania-American Water Company	Docket No. R-2020-3019369 (water) Docket No. R-2020-3019371 (wastewater)	Return on Equity
American Water Works Company Inc.	04/17	Pennsylvania-American Water Company	Docket No. R-2017-2595853	Return on Equity
South Dakota Public Utilities Commission				
MidAmerican Energy Company	05/22	MidAmerican Energy Company	D-NG22-005	Return on Equity
Northern States Power Company	06/14	Northern States Power Company	Docket No. EL14-058	Return on Equity
Texas Public Utility Commission				

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Entergy Texas, Inc.	07/22	Entergy Texas, Inc.	D-53719	Return on Equity
Southwestern Public Service Commission	08/19	Southwestern Public Service Commission	Docket No. D-49831	Return on Equity
Southwestern Public Service Company	01/14	Southwestern Public Service Company	Docket No. 42004	Return on Equity
Texas Railroad Commission				
CenterPoint Energy Entex and CenterPoint Energy Texas Gas	10/23	CenterPoint Energy Entex and CenterPoint Energy Texas Gas	2023 Texas Division Rate Case Case No. OS-23-00015513	Return on Equity
Utah Public Service Commission				
PacifiCorp d/b/a Rocky Mountain Power	05/20	PacifiCorp d/b/a Rocky Mountain Power	Docket No. 20-035-04	Return on Equity
Virginia State Corporation Commission				
Virginia American Water Company, Inc.	11/21	Virginia American Water Company, Inc.	Docket No. PUR-2023-00194	Return on Equity
Virginia American Water Company, Inc.	11/21	Virginia American Water Company, Inc.	Docket No. PUR-2021-00255	Return on Equity
Virginia American Water Company, Inc.	11/18	Virginia American Water Company, Inc.	Docket No. PUR-2018-00175	Return on Equity
Washington Utilities Transportation Commission				