

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO**

\* \* \* \* \*

IN THE MATTER OF ADVICE LETTER )  
NO. 1906-ELECTRIC OF PUBLIC )  
SERVICE COMPANY OF COLORADO )  
TO REVISE ITS COLORADO PUC NO. 8- ) PROCEEDING NO. 22AL-XXXXE  
ELECTRIC TARIFF TO REVISE )  
JURISDICTIONAL BASE RATE )  
REVENUES, IMPLEMENT NEW BASE )  
RATES FOR ALL ELECTRIC RATE )  
SCHEDULES, AND MAKE OTHER )  
PROPOSED TARIFF CHANGES )  
EFFECTIVE DECEMBER 31, 2022.

**DIRECT TESTIMONY AND ATTACHMENTS OF ANN E. BULKLEY**

**ON**

**BEHALF OF**

**PUBLIC SERVICE COMPANY OF COLORADO**

**November 30, 2022**

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**I. INTRODUCTION AND QUALIFICATIONS**

1

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Ann E. Bulkley. I am a Principal at The Brattle Group (“Brattle”). My  
4 business address is One Beacon Street, Suite 2600, Boston, Massachusetts  
5 02108.

6 **Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?**

7 A. I am submitting this Direct Testimony on behalf of Public Service Company of  
8 Colorado (“Public Service” or the “Company”), a Colorado corporation and wholly-  
9 owned subsidiary of Xcel Energy Inc. (“Xcel Energy”). Xcel Energy is a registered  
10 holding company that owns several electric, natural gas, and steam utility

1 operating companies, a regulated natural gas pipeline company, and three  
2 transmission service companies.<sup>1</sup>

3 **Q. PLEASE DESCRIBE YOUR BACKGROUND AND PROFESSIONAL**  
4 **EXPERIENCE IN THE ENERGY AND UTILITY INDUSTRIES.**

5 A. I hold a Bachelor's degree in Economics and Finance from Simmons College and  
6 a Master's degree in Economics from Boston University, with over 25 years of  
7 experience consulting to the energy industry. I have advised numerous energy  
8 and utility clients on a wide range of financial and economic issues with primary  
9 concentrations in valuation and utility rate matters. Many of these assignments  
10 have included the determination of the cost of capital for valuation and ratemaking  
11 purposes. My resume and a summary of testimony that I have filed in other  
12 proceedings are included as Attachment AEB-1.

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<sup>1</sup> Xcel Energy is the parent company of four utility operating companies: Public Service; Northern States Power Company, a Minnesota corporation; Northern States Power Company, a Wisconsin corporation; and Southwestern Public Service Company, a New Mexico corporation. Xcel Energy's natural gas pipeline company is WestGas Interstate, Inc. Through a subsidiary company, Xcel Energy Transmission Holding Company, LLC, Xcel Energy also owns three transmission-only operating companies: Xcel Energy Southwest Transmission Company, LLC; Xcel Energy Transmission Development Company, LLC; and Xcel Energy West Transmission Company, LLC, all of which are subject to Federal Energy Regulatory Commission jurisdiction.

1                                   **II. PURPOSE AND OVERVIEW OF TESTIMONY**

2   **Q.    WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

3   A.    The purpose of my Direct Testimony is to provide the Colorado Public Utilities  
4        Commission (“Commission”) with a recommendation regarding Public Service’s  
5        requested return on equity (“ROE”) for its vertically-integrated electric utility  
6        business in Colorado. I also provide an assessment of the reasonableness of the  
7        proposed capital structure to be used for ratemaking purposes. In order to  
8        evaluate the cost of equity and develop my ROE recommendation, I applied the  
9        Constant Growth Discounted Cash Flow (“DCF”) model, the Multi-Stage DCF  
10       model, the Capital Asset Pricing Model (“CAPM”), the Empirical Capital Asset  
11       Pricing Model (“ECAPM”), and the Bond Yield Plus Risk Premium approach to a  
12       proxy group of vertically-integrated electric utilities that are risk-comparable to  
13       Public Service.

14           I also discuss Public Service’s proposed regulated capital structure in  
15       support of the testimony of Company witness Mr. Paul A. Johnson. I compare  
16       Public Service’s proposed capital structure to the capital structures of my proxy  
17       group companies and conclude that the Company’s proposed capital structure for  
18       ratemaking purposes is reasonable.

19           My analyses and recommendations are supported by the data presented in  
20       Attachments AEB-2 through AEB-15, which have been prepared by me or under  
21       my supervision.

22   **Q.    HOW IS THE REMAINDER OF YOUR DIRECT TESTIMONY ORGANIZED?**

23   A.    The remainder of my Direct Testimony is organized as follows:

- 1           • Section III provides a summary of my analyses and conclusions;
- 2           • Section IV reviews the regulatory guidelines pertinent to the development  
3           of the cost of capital;
- 4           • Section V discusses current and prospective capital market conditions and  
5           the effect of those conditions on Public Service’s cost of equity;
- 6           • Section VI explains my selection of a proxy group of vertically-integrated  
7           electric utilities;
- 8           • Section VII describes my analyses and the analytical basis for the  
9           recommendation of the appropriate ROE for Public Service;
- 10          • Section VIII provides a discussion of specific business and financial risks  
11          that have a direct bearing on the ROE to be authorized for Public Service in  
12          this case;
- 13          • Section IX discusses Public Service’s capital structure as compared with  
14          the capital structures of the utility operating company subsidiaries of the  
15          proxy group companies; and
- 16          • Section X presents my conclusions and recommendations.

1                   **III. SUMMARY OF ANALYSES AND CONCLUSIONS**

2   **Q.   PLEASE SUMMARIZE THE KEY FACTORS CONSIDERED IN YOUR**  
3   **ANALYSES AND UPON WHICH YOU BASE YOUR RECOMMENDED ROE.**

4   A.   My analyses and recommendations consider the following:

- 5           • The United States (“U.S.”) Supreme Court’s *Hope* and *Bluefield* decisions,<sup>2</sup>  
6           which establish the standards for determining a fair and reasonable  
7           authorized ROE, including consistency of the authorized return with other  
8           businesses having similar risk, adequacy of the return to ensure access to  
9           capital and support credit quality, and the necessity for the end result to lead  
10          to just and reasonable rates.
- 11          • The results of several analytical approaches that provide estimates of the  
12          Company’s cost of equity. Because the Company’s authorized ROE should  
13          be a forward-looking estimate over the period during which the rates will be  
14          in effect, these analyses rely on forward-looking inputs and assumptions  
15          (e.g., projected analyst growth rates in the DCF model, forecasted risk-free  
16          rate and market risk premium in the CAPM analysis).
- 17          • The effect of current and prospective capital market conditions on the cost  
18          of equity estimation models and on investors’ return requirements.
- 19          • Public Service’s business risks relative to the proxy group companies and  
20          the implications of those risks in arriving at the appropriate ROE.

21   **Q.   HOW DID YOU DEVELOP YOUR RECOMMENDED ROE FOR THE COMPANY?**

22   A.   My recommended ROE for the Company is based on the results of several  
23   analytical approaches to estimate Public Service’s cost of equity based on a proxy  
24   group of publicly-traded vertically-integrated electric utility companies, current and  
25   projected capital market conditions, and the levels of regulatory, business, and  
26   financial risk faced by Public Service relative to the proxy group. I have relied on  
27   the results of multiple models used to estimate the cost of equity considering that,

---

<sup>2</sup> *Bluefield Waterworks & Improvement Co. v. Pub. Serv. Comm’n of West Virginia*, 262 U.S. 679, 692-93 (1923); *Fed. Power Comm’n v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944).



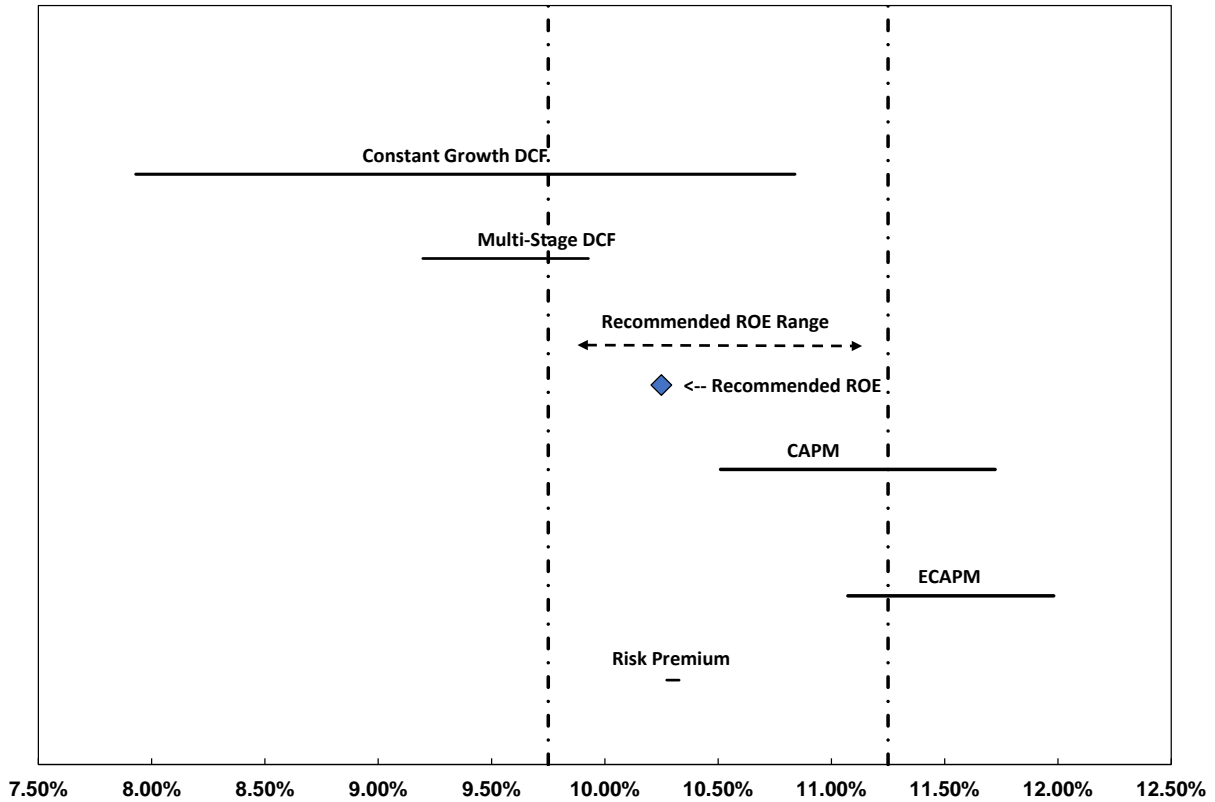
1 as discussed in Section V herein, current and forward capital market conditions  
2 are projected to affect the inputs and assumptions of these models over the period  
3 during which the Company's rates will be effective. Although the companies in my  
4 proxy group are generally comparable to Public Service, each company is unique,  
5 and no two companies have the exact same business and financial risk profiles.  
6 Accordingly, I considered the Company's business, financial and regulatory risk in  
7 aggregate relative to that of the proxy group companies when determining where  
8 the Company's ROE should fall within the reasonable range of analytical results to  
9 appropriately account for any residual differences in risk.

10 **Q. WHAT ARE THE RESULTS OF THE MODELS THAT YOU HAVE USED TO**  
11 **ESTIMATE THE COST OF EQUITY?**

12 A. Figure AEB-D-1 summarizes the range of results of my analyses.

1

**Figure AEB-D-1: Range of Analytical Results**



2

As shown in Figure AEB-D-1, the range of results produced by the models used to estimate the cost of equity is relatively 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. Capital market conditions are expected to affect the results of the cost of equity estimation models. Specifically:

8

- Inflation is expected to persist over the near-term, which increases the operating risk of the utility.

9

10

- Long-term interest rates are expected to increase over the near-term in response to inflation.

11

- 1           • Since utility stock prices are inversely related to changes in interest rates,  
2           and as interest rates are expected to increase, it is likely that utility share  
3           prices will decline.
- 4           • Equity analysts have noted the increased risk for the utility sector as a result  
5           of rising interest rates and therefore expect the sector to underperform over  
6           the near-term.
- 7           • Therefore, the results of the DCF model, which relies on current utility share  
8           prices, is likely to understate the cost of equity during the period that the  
9           Company's rates will be in effect.

10           Therefore, it is appropriate to consider all of these factors when estimating  
11           a reasonable range of the investor-required cost of equity and the recommended  
12           return on equity for Public Service.

13 **Q.   WHAT IS YOUR RECOMMENDED RANGE FOR THE COMPANY'S ROE IN**  
14 **THIS PROCEEDING?**

15 A.   Based on the analytical results presented in Figure AEB-D-1, the projected capital  
16           market conditions, and the levels of regulatory, business, and financial risk faced  
17           by Public Service relative to the proxy group, including the Company's history of  
18           earning less than its authorized ROE, I conclude that an ROE in the range from  
19           9.75 percent to 11.25 percent is reasonable.

20 **Q.   THE COMPANY IS REQUESTING A ROE OF 10.25 PERCENT. IN YOUR VIEW,**  
21 **IS THIS REASONABLE?**

22 A.   Yes.  Although the companies in my proxy group are generally comparable to  
23           Public Service, the Company's electric business faces higher risk than the proxy  
24           group companies in several important respects.  While the Commission relied on  
25           a year-end rate base in the Company's last general rate case, it has more often  
26           relied on a historical test year and average rate base for ratemaking purposes, the

1 risk of which has been reflected in the Company's inability to earn its authorized  
2 return in recent years. I also consider the Company's environmental leadership  
3 both nationally and in Colorado. As discussed in more detail in the remainder of  
4 my Direct Testimony, Public Service committed to reduce its carbon emissions by  
5 85 percent relative to 2005 levels by 2030, which will include significant  
6 investments in renewable generation. In order for Public Service to compete for  
7 capital on reasonable terms, these factors should be reflected in the Company's  
8 authorized ROE. Based on all of these factors, I conclude that the ROE requested  
9 by the Company of 10.25 percent is reasonable.

1 **IV. REGULATORY GUIDELINES**

2 **Q. PLEASE DESCRIBE THE PRINCIPLES THAT GUIDE THE ESTABLISHMENT**  
3 **OF THE COST OF CAPITAL FOR A REGULATED UTILITY.**

4 A. The U.S. Supreme Court's precedent-setting *Hope* and *Bluefield* cases  
5 established the standards for determining the fairness or reasonableness of a  
6 utility's authorized ROE. Among the standards established by the Court in those  
7 cases are: (1) consistency with other businesses having similar or comparable  
8 risks; (2) adequacy of the return to support credit quality and access to capital; and  
9 (3) the principle that the specific means of arriving at a fair return are not important,  
10 only that the end result leads to just and reasonable rates.<sup>3</sup>

11 **Q. HAS THE COMMISSION PROVIDED SIMILAR GUIDANCE IN ESTABLISHING**  
12 **THE APPROPRIATE RETURN ON COMMON EQUITY?**

13 A. Yes. The Commission follows the precedents of the *Hope* and *Bluefield* cases by  
14 acknowledging that utility investors are entitled to a fair and reasonable return. For  
15 example, the Commission has stated:

16 As regards the utility, to be just and reasonable, rates must generate  
17 revenues sufficient to meet the utility's cost of furnishing services,  
18 and provide its investors with fair and reasonable return on their  
19 investments. The Commission must ensure that the utility has  
20 adequate revenues for operating expenses and to cover the capital  
21 costs of doing business. The revenues must be sufficient to assure  
22 confidence in the financial integrity of the utility, in order to maintain  
23 its credit and attract capital.<sup>4</sup>

24 Similarly, the Commission has also stated:

---

<sup>3</sup> *Bluefield*, 262 U.S. at 692-93; *Hope*, 320 U.S. at 603.

<sup>4</sup> Proceeding No. 21AL-0317E, Decision No. C22-0178, pp. 8-9; citations omitted.

1 To be consistent with sound regulatory economics and the standards  
2 set forth by the Supreme Court in the *Bluefield* and *Hope* cases, a  
3 utility's allowed ROE should be: (i) similar to that of other financially  
4 sound businesses having similar or comparable risk, (ii) sufficient to  
5 ensure confidence in the financial integrity of the utility, and (iii)  
6 adequate to maintain and support the credit of the utility, thereby  
7 enabling it to attract, on a reasonable cost basis, the funds necessary  
8 to satisfy its capital requirements so that it can meet the obligation to  
9 provide adequate and reliable service to the public.<sup>5</sup>

10 **Q. WHY IS IT IMPORTANT FOR A UTILITY TO BE ALLOWED THE**  
11 **OPPORTUNITY TO EARN A RETURN THAT IS ADEQUATE TO ATTRACT**  
12 **CAPITAL AT REASONABLE TERMS?**

13 A. A return that is adequate to attract capital on reasonable terms enables Public  
14 Service to provide safe, reliable electric service while maintaining its financial  
15 integrity. That return should be commensurate with returns required by investors  
16 elsewhere in the market for investments of comparable risk. To the extent the  
17 Company has the opportunity to earn its market-based cost of capital, a  
18 reasonable balance will be achieved between customers' and shareholders'  
19 interests.

20 **Q. IS A UTILITY'S ABILITY TO ATTRACT CAPITAL ALSO AFFECTED BY THE**  
21 **ROEs AUTHORIZED FOR OTHER UTILITIES?**

22 A. Yes. Utilities compete directly for capital with other investments of similar risk,  
23 which include other electric and natural gas utilities. Therefore, the ROE awarded  
24 to a utility sends an important signal to investors regarding whether there is  
25 regulatory support for financial integrity, dividends, growth, and fair compensation

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<sup>5</sup> Proceeding Nos. 11AL-382E and 11AL-387E, Decision No. C11-1373, at ¶ 87.

1 for business and financial risk. The cost of capital represents an opportunity cost  
2 to investors. If higher returns are available for other investments of comparable  
3 risk, over the same time period, investors have an incentive to direct their capital  
4 to those alternative investments.

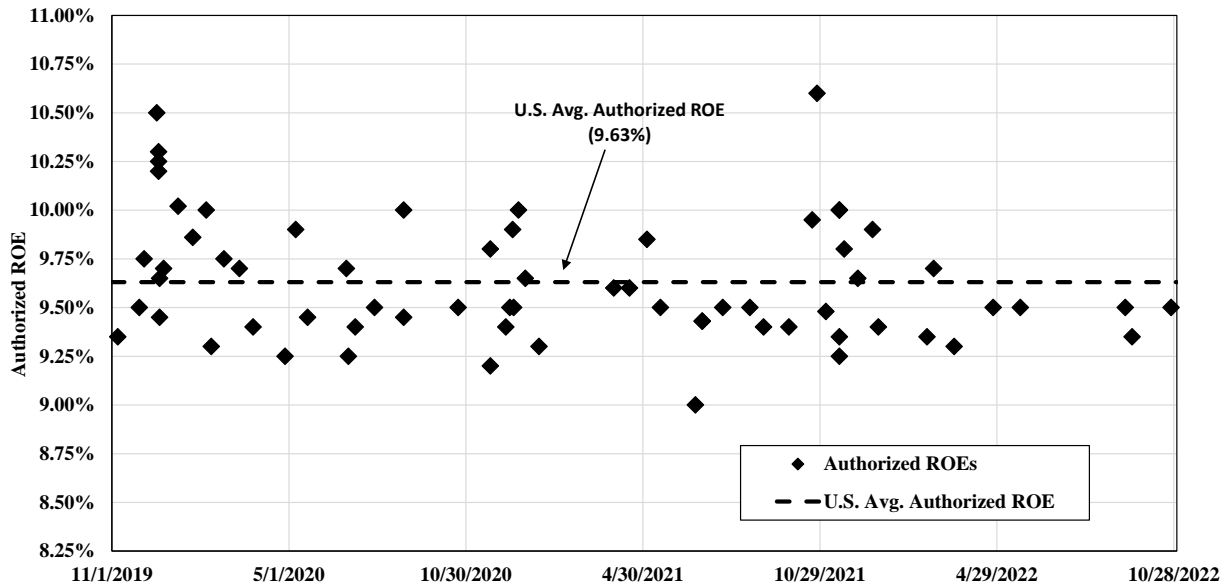
5 **Q. DOES THE FACT THAT THE COMPANY IS OWNED BY XCEL ENERGY, A**  
6 **PUBLICLY-TRADED COMPANY, AFFECT YOUR ANALYSIS?**

7 A. No. In this proceeding, consistent with stand-alone ratemaking principles, it is  
8 appropriate to establish the cost of equity for Public Service, not its publicly-traded  
9 parent, Xcel Energy. More importantly, however, it is appropriate to establish a  
10 cost of equity and capital structure that provide Public Service the ability to attract  
11 capital on reasonable terms, on a stand-alone basis, and within Xcel Energy.

12 **Q. HOW DOES PUBLIC SERVICE'S REQUESTED ROE COMPARE WITH**  
13 **RECENTLY AUTHORIZED ROEs FOR VERTICALLY-INTEGRATED ELECTRIC**  
14 **UTILITIES?**

15 A. As shown in Figure AEB-D-2, the authorized ROEs for vertically-integrated electric  
16 utilities over the past three years have averaged 9.63 percent. The current  
17 authorized ROE for Public Service is 9.30 percent, which is relatively low  
18 compared to national standards.

1 **Figure AEB-D-2: Authorized ROEs for Vertically-Integrated Electric Utilities in**  
2 **Past Three Years<sup>6</sup>**



3 This is important because, in order to attract capital on reasonable terms  
4 and conditions, Public Service must have an authorized return that is comparable  
5 to those available to investors in companies with comparable risk.

6 **Q. ARE THE REGULATORY FRAMEWORK, THE AUTHORIZED ROE, AND THE**  
7 **EQUITY RATIO IMPORTANT TO THE FINANCIAL COMMUNITY?**

8 A. Yes. The regulatory framework is one of the most important factors of debt and  
9 equity investors' assessments of risk. Specifically regarding debt investors, credit  
10 rating agencies consider the authorized ROE and equity ratio for regulated utilities  
11 to be very important for two reasons: (1) they help determine the cash flows and  
12 credit metrics of the regulated utility; and (2) they provide an indication of the  
13 degree of regulatory support for credit quality in the jurisdiction. In fact, credit rating

<sup>6</sup> Regulatory Research Associates, as of October 31, 2022.



1 agencies have instituted negative ratings actions in reaction to regulatory  
2 commission decisions authorizing a cost of equity that is deemed to increase risk  
3 by reducing future cash flow.

4 For example, most recently, amendments made by the Arizona Corporation  
5 Commission ("ACC") in October 2021 to an Administrative Law Judge's  
6 recommended order in an Arizona Public Service Company ("APS") rate  
7 proceeding caused credit rating agencies to institute negative ratings actions.  
8 Specifically, the ACC recommended reducing the ROE for APS from 10.00 percent  
9 to 8.70 percent. Upon the announcement of those amendments, which were  
10 subject to a final ACC decision, Fitch downgraded the issuer default credit rating  
11 of APS from A to A-, and its parent, Pinnacle West Capital Corporation ("PNW")  
12 from A- to BBB+, citing heightened business risk.<sup>7</sup> On November 2, 2021, the ACC  
13 voted to establish APS's ROE at 8.70 percent. Subsequently, Moody's also  
14 downgraded APS from A2 to A3 and PNW from A3 to Baa1.<sup>8</sup> Moody's noted that  
15 the downgrade was a function of "the recent decline in Arizona regulatory  
16 environment following the conclusion of the utility's 2019 rate case as well as the  
17 organization's weakened credit metrics."<sup>9</sup>

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<sup>7</sup> FitchRatings, "Fitch Downgrades Pinnacle West Capital & Arizona Public Service to 'BBB+'; Outlooks Remain Negative," October 12, 2021.

<sup>8</sup> Moody's Investors Service, "Rating Actions: Moody's downgrades Pinnacle West to Baa1 and Arizona Public Service to A3," November 17, 2021.

<sup>9</sup> *Id.*

1 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING REGULATORY**  
2 **GUIDELINES?**

3 A. The Commission's order in this proceeding should establish rates that provide  
4 Public Service with the reasonable opportunity to earn an ROE that is: (1)  
5 adequate to attract capital at reasonable terms; (2) sufficient to ensure its financial  
6 integrity; and (3) commensurate with returns on investments in enterprises with  
7 similar risk. It is important for the ROE authorized in this proceeding to take into  
8 consideration current and projected capital market conditions, as well as investors'  
9 expectations and requirements for both risks and returns.

1                                   **V. CAPITAL MARKET CONDITIONS**

2   **Q.   WHY IS IT IMPORTANT TO ANALYZE CAPITAL MARKET CONDITIONS?**

3   A.   The models used to estimate the cost of equity rely on market data that are either  
4       specific to the proxy group, in the case of the DCF model, or to the expectations  
5       of market risk, in the case of the CAPM. The results of the cost of equity estimation  
6       models can be affected by prevailing market conditions at the time the analysis is  
7       performed. While the ROE established in a rate proceeding is intended to be  
8       forward-looking, the analyst uses current and projected market data, specifically  
9       stock prices, dividends, growth rates and interest rates, in the cost of equity  
10      estimation models in order to estimate the investor-required return for the subject  
11      company.

12           As discussed in the remainder of this section, analysts and regulatory  
13      commissions have concluded that current market conditions have affected the  
14      results of the cost of equity estimation models. As a result, it is important to  
15      consider the effect of the market conditions on these models when determining an  
16      appropriate range for the ROE and the recommended ROE for ratemaking  
17      purposes for a future period. If investors do not expect current market conditions  
18      to be sustained in the future, it is possible that the cost of equity estimation models  
19      will not provide an accurate estimate of investors' required return during that rate  
20      period. Therefore, it is very important to consider projected market data to  
21      estimate the return for that forward-looking period.

1 **Q. WHAT FACTORS ARE AFFECTING THE COST OF EQUITY FOR REGULATED**  
2 **UTILITIES IN THE CURRENT AND PROSPECTIVE CAPITAL MARKETS?**

3 A. The cost of equity for regulated utility companies is being affected by several  
4 factors in the current and prospective capital markets, including: (1) changes in  
5 monetary policy; (2) currently high inflation that has continued well into 2022; (3)  
6 increasing interest rates; and (4) volatile market conditions. These factors affect  
7 the assumptions used in the cost of equity estimation models.

8 **Q. WHAT EFFECT DO CURRENT AND PROSPECTIVE MARKET CONDITIONS**  
9 **HAVE ON THE COST OF EQUITY FOR THE COMPANY?**

10 A. The combination of persistently high inflation, the Federal Reserve's changes in  
11 monetary policy, and the dramatic shifts in market conditions resulting from political  
12 influences all contribute to an expectation of increased market risk and an increase  
13 in the cost of the investor-required return on equity. Therefore, it is very important  
14 to consider projected market data to estimate the return for that forward-looking  
15 period.

16 Specifically, inflation is currently at its highest level seen in approximately  
17 40 years. Interest rates, which have increased significantly from pandemic-related  
18 lows seen in 2020, are expected to continue to increase in direct response to the  
19 Federal Reserve's use of monetary policy to combat inflation. As discussed later  
20 herein, since there is a strong historical inverse correlation between interest rates  
21 and the share prices of utility stocks, it is reasonable to expect that investors' cost  
22 of equity is increasing (*i.e.*, as utility share prices decline, utility dividend yields  
23 increase). Because the cost of equity in this proceeding is being estimated for the

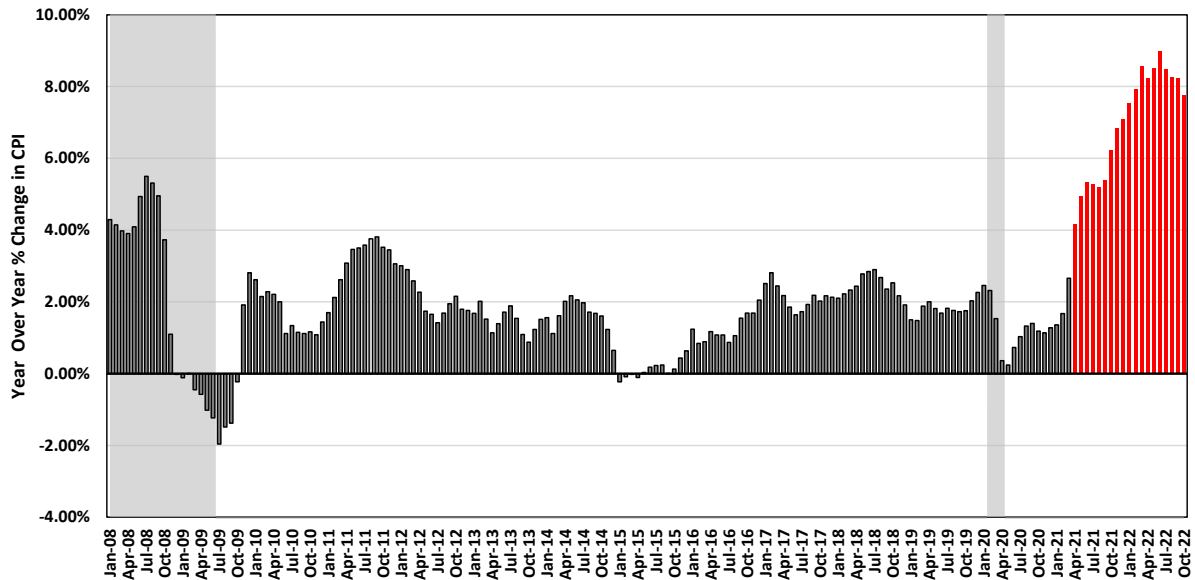
1 future period that the Company's rates will be in effect, and because the cost of  
2 equity is expected to increase over the near-term for utilities, cost of equity  
3 estimates based in whole or in part on historical or current market conditions, as  
4 opposed to projected market conditions, will likely understate the cost of equity  
5 during the future period that the Company's rates will be in effect.

6 **A. Inflationary Expectations in Current and Projected Capital Market**  
7 **Conditions**

8 **Q. HAS INFLATION INCREASED SIGNIFICANTLY OVER THE PAST YEAR?**

9 A. Yes. As shown in Figure AEB-D-3, the year-over-year ("YOY") change in the  
10 Consumer Price Index ("CPI") published by the Bureau of Labor statistics has  
11 increased steadily since the beginning of 2021, rising from 1.37 percent in January  
12 2021 to reaching a high of 9.0 percent YOY change in June 2022, which was the  
13 largest 12-month increase since 1981 and significantly greater than any level seen  
14 since January 2008. As shown in Figure AEB-D-3, since that time, inflation  
15 continues to remain elevated.

1 **Figure AEB-D-3: Consumer Price Index – YOY Percent Change January 2008–**  
2 **October 2022<sup>10</sup>**



3 **Q. WHAT ARE THE EXPECTATIONS FOR INFLATION OVER THE NEAR-TERM?**

4 A. The expectation is that inflation will remain elevated over the near-term. This  
5 expectation is supported by recent comments of the Chair and Vice Chair of the  
6 Federal Reserve. For example, in her speech on September 7, 2022 at the  
7 Clearing House and Bank Policy Institute 2022 Annual Conference, Vice Chair  
8 Lael Brainard noted that:

9 We are in this for as long as it takes to get inflation down. So far, we  
10 have expeditiously raised the policy rate to the peak of the previous  
11 cycle, and the policy rate will need to rise further. As of this month,  
12 the maximum monthly reduction in the balance sheet will be nearly  
13 double the level of the previous cycle. Together, the increase in the  
14 policy rate and the reduction in the balance sheet should help bring  
15 demand into alignment with supply. Monetary policy will need to be  
16 restrictive for some time to provide confidence that inflation is moving  
17 down to target. The economic environment is highly uncertain, and  
18 the path of policy will be data dependent. While the precise course  
19 of action will depend on the evolution of the outlook, I am confident

<sup>10</sup> Bureau of Labor Statistics; shaded area indicates a recession.

1 we will achieve a return to 2 percent inflation. Our resolve is firm,  
2 our goals are clear, and our tools are up to the task.<sup>11</sup>

3 Subsequently, Chair Powell noted in his press conference at the Federal Open  
4 Market Committee meeting in September 2022 that:

5 Inflation remains well above our 2 percent longer-run goal. ... Price  
6 pressures remain evident across a broad range of goods and  
7 services. Although gasoline prices have turned down in recent  
8 months, they remain well above year-earlier levels, in part reflecting  
9 Russia's war against Ukraine, which has boosted prices for energy  
10 and food and has created additional upward pressure on inflation.  
11 The median projection in the SEP for total PCE inflation is 5.4  
12 percent this year and falls to 2.8 percent next year, 2.3 percent in  
13 2024, and 2 percent in 2025; participants continue to see risks to  
14 inflation as weighted to the upside.<sup>12</sup>

15 Finally, at the Federal Open Market Committee meeting in November 2022, Chair  
16 Powell noted that:

17 My colleagues and I are strongly committed to bringing inflation back  
18 down to our 2 percent goal. We have both the tools that we need and  
19 the resolve it will take to restore price stability on behalf of American  
20 families and businesses. Price stability is the responsibility of the  
21 Federal Reserve and serves as the bedrock of our economy. Without  
22 price stability, the economy does not work for anyone. In particular,  
23 without price stability, we will not achieve a sustained period of strong  
24 labor market conditions that benefit all.

25 Today, the FOMC raised our policy interest rate by 75 basis points,  
26 and we continue to anticipate that ongoing increases will be  
27 appropriate. We are moving our policy stance purposefully to a level  
28 that will be sufficiently restrictive to return inflation to 2 percent. In  
29 addition, we are continuing the process of significantly reducing the  
30 size of our balance sheet.

31 Restoring price stability will likely require maintaining a restrictive  
32 stance of policy for some time.

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<sup>11</sup> Vice Chair Lael Brainard, "Bringing Inflation Down," Clearing House and Bank Policy Institute 2022 Annual Conference, September 7, 2022.

<sup>12</sup> Transcript, Chair Powell, Press Conference, September 21, 2022.

1 At today's meeting the Committee raised the target range for the  
2 federal funds rate by 75 basis points. And we are continuing the  
3 process of significantly reducing the size of our balance sheet, which  
4 plays an important role in firming the stance of monetary policy.

5 With today's action, we have raised interest rates by 3-3/4  
6 percentage points this year. We anticipate that ongoing increases in  
7 the target range for the federal funds rate will be appropriate in order  
8 to attain a stance of monetary policy that is sufficiently restrictive to  
9 return inflation to 2 percent over time.<sup>13</sup>

10 **B. The Use of Monetary Policy to Address Inflation**

11 **Q. WHAT POLICY ACTIONS HAS THE FEDERAL RESERVE ENACTED TO**  
12 **RESPOND TO INCREASED INFLATION?**

13 A. The dramatic increase in inflation has prompted the Federal Reserve to pursue an  
14 aggressive normalization of monetary policy, removing the accommodative policy  
15 programs used to mitigate the economic effects of COVID-19. As of the FOMC's  
16 November 2, 2022 meeting, the Federal Reserve has taken the following actions:

- 17 • Completed its taper of Treasury bond and mortgage-backed securities  
18 purchases;<sup>14</sup>
- 19 • Increased the target federal funds rate beginning in March 2022 through a  
20 series of five increases from 0.00 – 0.25 percent to 3.25 percent to 4.00  
21 percent;<sup>15</sup>
- 22 • Anticipates ongoing increases in the target range will be appropriate to  
23 achieve its goals of maximum employment at the inflation rate of 2 percent  
24 over the long-run;<sup>16</sup>
- 25 • Began reducing its holdings of Treasury and mortgage-backed securities  
26 on June 1, 2022.<sup>17</sup> The Federal Reserve is reducing the size of its balance  
27 sheet by only reinvesting principal payments on owned securities after the

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<sup>13</sup> Transcript, Chair Powell, Press Conference, November 2, 2022.

<sup>14</sup> Federal Reserve Bank of New York, <https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/treasury-securities/treasury-securities-operational-details#monthly-details>.

<sup>15</sup> Federal Reserve, Press Releases, March 16, 2022, May 4, 2022, June 15, 2022, September 22, 2022 and November 2, 2022.

<sup>16</sup> Federal Reserve, Press Release, July 27, 2022.

<sup>17</sup> Federal Reserve, Press Release, May 4, 2022.



1 total amount of payments received exceeds a defined cap. For Treasury  
2 Securities, the cap is set at \$30 billion per month for the first three months  
3 and \$60 billion per month after the first three months. The cap for mortgage-  
4 backed securities is set at \$17.5 billion per month for the first three months  
5 and \$35 billion per month thereafter.<sup>18</sup>

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

8 **Q. WHAT EFFECT WILL INFLATION AND THE FEDERAL RESERVE'S**  
9 **NORMALIZATION OF MONETARY POLICY HAVE ON LONG-TERM INTEREST**  
10 **RATES?**

11 A. Inflation and the Federal Reserve's normalization of monetary policy will likely  
12 result in increases in long-term interest rates. Specifically, inflation reduces the  
13 purchasing power of the future interest payments an investor expects to receive  
14 over the duration of the bond. This risk increases the longer the duration of the  
15 bond. As a result, if investors expect increased levels of inflation, they will require  
16 higher yields to compensate for the increased risk of inflation, which means interest  
17 rates will increase.

18 **Q. HAVE THE YIELDS ON LONG-TERM GOVERNMENT BONDS INCREASED IN**  
19 **RESPONSE TO INFLATION AND THE FEDERAL RESERVE'S**  
20 **NORMALIZATION OF MONETARY POLICY?**

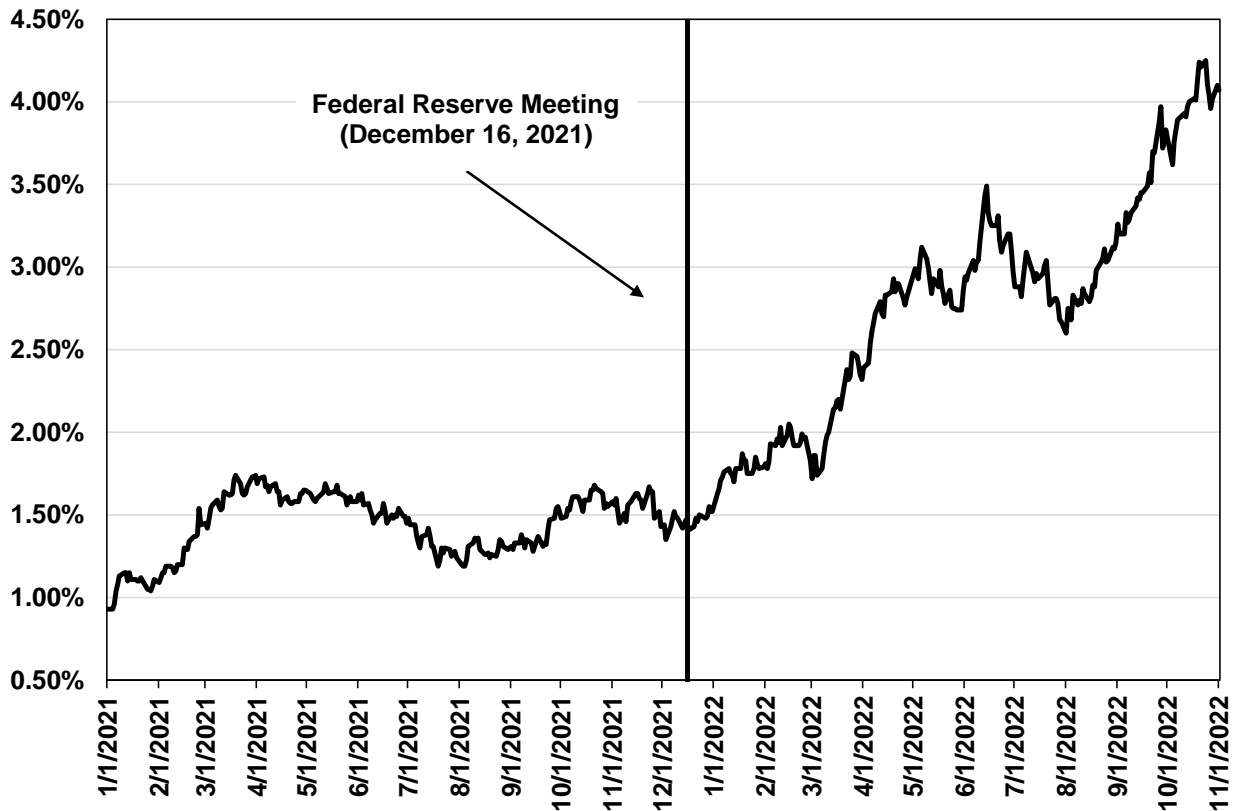
21 A. Yes, they have. At the FOMC meetings throughout 2022, the Federal Reserve  
22 has continued to note its concerns over the sustained increased levels of inflation  
23 and has continued to accelerate the process of normalizing monetary policy to

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<sup>18</sup> Federal Reserve, Plans for Reducing the Size of the Federal Reserve's Balance Sheet, Press Release, May 4, 2022.

1 combat inflation. As shown in Figure AEB-D-4, since the Federal Reserve's  
2 December 2021 meeting, the yield on 10-year Treasury bond has nearly tripled,  
3 increasing from 1.47 percent on December 15, 2021 to 4.10 percent on October  
4 31, 2022. The increase is due to the Federal Reserve's announcements at the  
5 each of the meetings since December 2021 and the continued increased levels of  
6 inflation that are now expected to persist much longer than the Federal Reserve  
7 and investors had originally projected.

8 **Figure AEB-D-4: 10-Year Treasury Bond Yield – Jan 2021 through Oct 2022<sup>19</sup>**



<sup>19</sup> S&P Capital IQ Pro.

1 **Q. WHAT HAVE EQUITY ANALYSTS SAID ABOUT LONG-TERM GOVERNMENT**  
2 **BOND YIELDS?**

3 A. Leading equity analysts have noted that they expect the yields on long-term  
4 government bonds to remain elevated through at least the end of 2023. According  
5 to the most recent *Blue Chip Financial Forecasts* report, the consensus estimate  
6 of the average yield on the 10-year Treasury Bond is 3.80 percent through  
7 Q1/2024.<sup>20</sup>

8 **Q. DO RECENT CHANGES IN GROSS DOMESTIC PRODUCT (“GDP”) AFFECT**  
9 **THE CURRENT OUTLOOK FOR INFLATION AND INTEREST RATES?**

10 A. No. While FOMC participants have reduced their projections for economic activity  
11 for real GDP growth to 0.2 percent in 2022 and 1.2 percent in 2023,<sup>21</sup> which is well  
12 below the median estimate for the longer-run normal GDP growth rate, the Fed  
13 has highlighted that the labor market continues to be extremely tight. Specifically,  
14 Chair Powell noted at the November 2022 FOMC meeting that unemployment was  
15 at a 50-year low and job vacancies remain very high. Therefore, with a tight labor  
16 market and persistently high inflation, the Fed has indicated its need to continue a  
17 restrictive monetary policy to moderate demand to better align it with supply.<sup>22</sup>

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<sup>20</sup> *Blue Chip Financial Forecasts*, Vol. 41, No. 11, November 1, 2022.

<sup>21</sup> FOMC, Summary of Economic Projections, September 21, 2022.

<sup>22</sup> Transcript, Chair Powell, Press Conference, November 2, 2022.

1 **D. Expected Performance of Utility Stocks and the Investor-Required Cost of**  
2 **Equity on Utility Investments**

3 **Q. ARE UTILITY SHARE PRICES CORRELATED TO CHANGES IN THE YIELDS**  
4 **ON LONG-TERM GOVERNMENT BONDS?**

5 A. Yes. Interest rates and utility share prices are inversely correlated, which means  
6 that increases in interest rates result in declines in the share prices of utilities and  
7 vice versa. For example, Goldman Sachs and Deutsche Bank examined the  
8 sensitivity of share prices of different industries to changes in interest rates over  
9 the past five years. Both Goldman Sachs and Deutsche Bank found that utilities  
10 had one of the strongest negative relationships with bond yields (*i.e.*, increases in  
11 bond yields resulted in the decline of utility share prices).<sup>23</sup>

12 **Q. HOW DO EQUITY ANALYSTS EXPECT THE UTILITIES SECTOR TO**  
13 **PERFORM IN AN INCREASING INTEREST RATE ENVIRONMENT?**

14 A. Equity analysts project that utilities will underperform the broader market as  
15 interest rates increase. Fidelity recently classified the utility sector as  
16 underweight<sup>24</sup> and Morningstar recently noted that as long as inflation persists the  
17 utility sector will underperform.<sup>25</sup> Specifically, Morningstar noted that:

18 [a]s long as inflation remains the market's top concern, we expect  
19 utilities to underperform. Utilities are the most sensitive to inflation  
20 because of their mostly fixed revenue, large capital investment  
21 budgets, and borrowing needs. We think long-term investors who

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<sup>23</sup> Lee, Justina. "Wall Street Is Rethinking the Treasury Threat to Big Tech Stocks." Bloomberg.com, 11 Mar. 2021, [www.bloomberg.com/news/articles/2021-03-11/wall-street-is-rethinking-the-treasury-threat-to-big-tech-stocks](https://www.bloomberg.com/news/articles/2021-03-11/wall-street-is-rethinking-the-treasury-threat-to-big-tech-stocks).

<sup>24</sup> Fidelity, "Top sectors to watch in Q2," August 3, 2022.

<sup>25</sup> Miller, Travis, "As Long as Inflation Worries Persist, We Expect Utilities to Underperform: Renewable energy continues to be a long-term boon for the sector," July 6, 2022.

1 want utilities in their portfolios should focus on those in constructive  
2 regulatory environments with the most protection from inflation.<sup>26</sup>

3 **Q. HAVE YOU REVIEWED ANY MARKET INDICATORS THAT MAY IMPLY THAT**  
4 **UTILITIES WILL UNDERPERFORM OVER THE NEAR-TERM?**

5 A. Yes, I have. As discussed above, the utility sector is considered a “bond proxy” or  
6 a sector that investors view as a “safe haven” alternative to bonds, and changes  
7 in utility stock prices are therefore inversely related to changes in interest rates.  
8 For example, the utility sector tends to perform well when interest rates are low  
9 since the dividend yields for utilities offer investors the prospect of higher returns  
10 when compared to the yields on long-term government bonds. Conversely, the  
11 utility sector underperforms as the yields on long-term government bonds increase  
12 and the spread between the dividend yields on utility stocks and the yields on long-  
13 term government bonds decreases. Therefore, I examined the difference (“yield  
14 spread”) between the dividend yields of utility stocks and the yields on long-term  
15 government bonds from January 2010 through October 2022. I selected the  
16 dividend yield on the S&P Utilities Index as the measure of the dividend yields for  
17 the utility sector and the yield on the 10-year Treasury bond as the estimate of the  
18 yield on long-term government bonds.

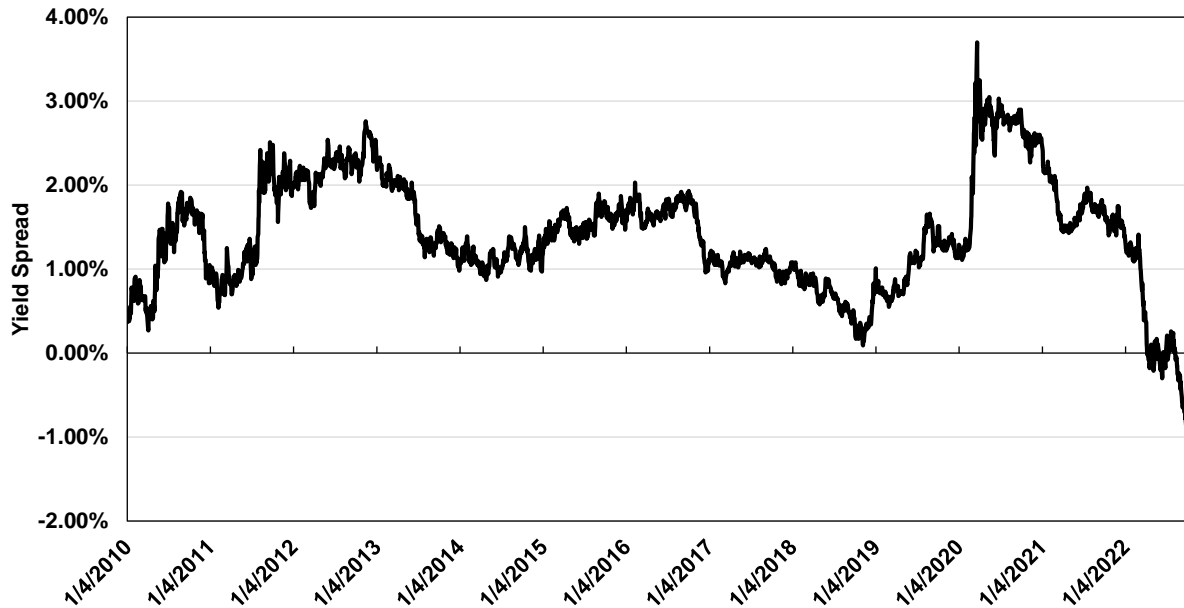
19 As shown in Figure AEB-D-5, the yield spread as of October 31, 2022 was  
20 -0.99 percent, which indicates that the yield on the 10-year Treasury bond has  
21 exceeded the dividend yield for the S&P Utilities Index. Furthermore, the current  
22 negative yield spread is well below the long-term average yield spread of 1.39

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<sup>26</sup> *Id.*

1 percent since January 2010. Given that the yield spread is currently well below  
2 the long-term average, as well as the expectation that interest rates will continue  
3 to increase, it is reasonable to conclude that utility sector will most likely  
4 underperform over the near-term. This is because investors that purchased utility  
5 stocks as an alternative to the lower yields on long-term government bonds would  
6 otherwise be inclined to rotate back into government bonds, particularly as the  
7 yields on long-term government bonds continue to increase, thus resulting in a  
8 decrease in the share prices of utilities.

9 **Figure AEB-D-5: Spread between the S&P Utilities Index Dividend Yield and the**  
10 **10-year Treasury Bond Yield, Jan 2012 – Oct 2022<sup>27</sup>**

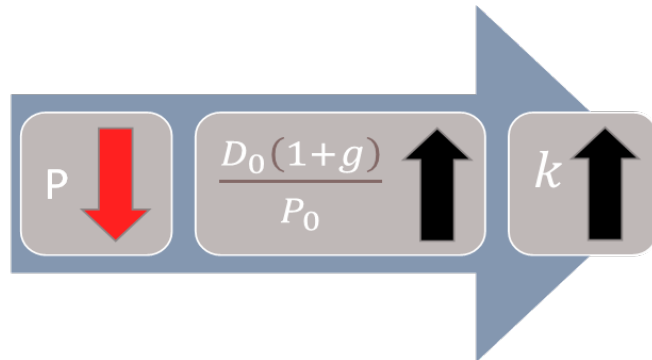


<sup>27</sup> S&P Capital IQ Pro and Bloomberg Professional.

1 **Q. WHAT IS THE SIGNIFICANCE OF THE INVERSE RELATIONSHIP BETWEEN**  
2 **INTEREST RATES AND UTILITY SHARE PRICES IN THE CURRENT**  
3 **MARKET?**

4 A. If interest rates increase as expected, then the share prices of utilities will decline.  
5 If the prices of utility stocks decline, then the DCF model, which relies on historical  
6 averages of share prices to calculate the dividend yield, is likely to understate the  
7 dividend yield and thus the cost of equity. For example, Figure AEB-D-6  
8 summarizes the effect of price on the dividend yield in the Constant Growth DCF  
9 model.

10 **Figure AEB-D-6: The Effect of a Decline in Stock Prices on the Constant Growth**  
11 **DCF Model**



12 As shown, a decline in stock prices will increase the dividend yields and  
13 thus the estimate of the cost of equity produced by the Constant Growth DCF  
14 model.

15 **Q. HOW HAVE INTEREST RATES AND INFLATION CHANGED SINCE THE**  
16 **COMPANY'S LAST ELECTRIC RATE CASE?**

17 A. As shown in Figure AEB-D-7, when the Commission authorized an ROE of 9.83  
18 percent in the Company's 2014 rate proceeding, interest rates (as measured by  
19 the 30-year Treasury bond yield) were 2.63 percent at the time of the Commission

1 decision, and inflation was non-existent. Subsequently, when the Commission  
 2 authorized an ROE of 9.30 percent in the Company's 2019 Phase I Electric Rate  
 3 Case, Proceeding No. 19AL-0268E ("2019 Phase I Electric Rate Case"), interest  
 4 rates had declined to 2.19 percent, and inflation was 1.48 percent. However, since  
 5 the Company's last rate proceeding, interest rates have nearly doubled, increasing  
 6 by approximately 185 basis points and, as discussed, inflation is at 40-year highs  
 7 and approximately 5.5 times higher.

8 **Figure AEB-D-7: Change in Market Conditions Since Company's Last Case<sup>28</sup>**

Description	Date	Federal Funds Rate	30-Day Avg of 30-Year Treasury Bond Yield	Inflation Rate	Auth'd ROE
Order, Docket Nos. 14AL-0660E/14A-0680	3/31/2015	0.11%	2.63%	-0.02%	9.83%
Order, Docket No. 19AL-0268E	2/11/2020	1.58%	2.19%	1.48%	9.30%
Current	11/8/2022	3.08%	4.05%	8.22%	

9 **E. Conclusion**

10 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE EFFECT OF CURRENT**  
 11 **MARKET CONDITIONS ON THE COST OF EQUITY FOR THE COMPANY?**

12 A. Over the near-term, investors expect long-term interest rates to increase in  
 13 response to continued elevated levels of inflation and the Federal Reserve's  
 14 normalization of monetary policy. Because utility stock prices have been relatively  
 15 high and the share prices of utilities are inversely correlated to interest rates, an

<sup>28</sup> St. Louis Federal Reserve Bank; Bureau of Labor Statistics.



1 increase in long-term government bond yields will likely result in a decline in utility  
2 share prices, which is the reason a number of equity analysts expect the utility  
3 sector to underperform over the near-term. The expected underperformance of  
4 utilities means that DCF models using recent historical data likely underestimate  
5 investors' required return over the period that rates will be in effect. Therefore, this  
6 expected change in market conditions supports consideration of the higher end of  
7 the range of cost of equity results produced by the DCF models. Moreover,  
8 prospective market conditions warrant consideration of other cost of equity  
9 estimation models such as the CAPM and ECAPM, which may better reflect  
10 expected market conditions. For example, two out of three inputs to the CAPM  
11 (*i.e.*, the market risk premium and risk-free rate) are forward-looking.

1 **VI. PROXY GROUP SELECTION**

2 **Q. WHY HAVE YOU USED GROUPS OF PROXY COMPANIES TO ESTIMATE THE**  
3 **COST OF EQUITY FOR PUBLIC SERVICE?**

4 A. In this proceeding, I am estimating the cost of equity for Public Service, a  
5 rate-regulated subsidiary of Xcel Energy. Since the cost of equity is a market-  
6 based concept and given the fact that Public Service's electric utility operations do  
7 not make up the entirety of a publicly-traded entity, it is necessary to establish a  
8 group of companies that is both publicly-traded and comparable to Public Service  
9 in certain fundamental business and financial respects to serve as its "proxy" for  
10 purposes of estimating the cost of equity.

11 Even if Public Service's regulated electric utility business made up the  
12 entirety of a publicly-traded entity, it is possible that transitory events could bias its  
13 market value over a given time period. A significant benefit of using a proxy group  
14 is that it mitigates the effects of anomalous events that may be associated with any  
15 one company. The proxy companies used in my analyses all possess a set of  
16 operating and financial risk characteristics that are substantially comparable to  
17 Public Service, and, therefore, provide a reasonable basis to estimate a market-  
18 based cost of equity for the Company.

19 **Q. PLEASE PROVIDE A BRIEF PROFILE OF PUBLIC SERVICE.**

20 A. Public Service is a wholly-owned subsidiary of Xcel Energy that provides electric  
21 generation, transmission, and distribution services to approximately 1.5 million  
22 retail customers and gas distribution service to approximately 1.5 million retail  
23 customers, primarily in eastern Colorado. The Company has total assets of

1 approximately \$22 billion, including 6,228 MW of generating capacity, over 24,000  
2 miles of transmission lines and nearly 79,000 miles of distribution lines.<sup>29</sup> Public  
3 Service's current long-term issuer credit ratings are shown in Figure AEB-D-8.

4 **Figure AEB-D-8: Public Service Credit Ratings<sup>30</sup>**

Credit Rating Agency	Rating	Outlook
Standard & Poor's	A-	Stable
Moody's Investors Service	A3	Stable

5 **Q. HOW DID YOU SELECT THE COMPANIES IN YOUR PROXY GROUP?**

6 A. I began with the group of 36 companies that *Value Line Investment Survey* ("*Value*  
7 *Line*") classifies as electric utilities and applied the following screening criteria to  
8 exclude companies that:

- 9 • pay consistent quarterly cash dividends, because companies that do not  
10 cannot be analyzed using the Constant Growth DCF model;
- 11 • have investment grade long-term issuer ratings from S&P and/or Moody's;
- 12 • are covered by at least two utility industry analysts;
- 13 • have positive long-term earnings growth forecasts from at least two utility  
14 industry equity analysts;
- 15 • derive more than 60.00 percent of their total operating income from  
16 regulated operations;
- 17 • derive more than 50.00 percent of regulated operating income from electric  
18 utility operations;
- 19 • own electric generation in rate base,
- 20 • derive more than 15 percent of generation from owned generation, and;
- 21 • are not parties to a merger or transformative transaction during the  
22 analytical periods relied on.

<sup>29</sup> Xcel Energy Inc., SEC Form 10-K, February 23, 2022, at 4.

<sup>30</sup> Moody's Investors Service, Credit Opinion, December 24, 2021.

1 **Q. DID YOU INCLUDE PUBLIC SERVICE'S PARENT COMPANY, XCEL ENERGY,**  
2 **IN YOUR ANALYSIS?**

3 A. No. In order to avoid the circular logic that otherwise would occur, it is my practice  
4 to exclude the subject company, or its parent holding company, from the proxy  
5 group.

6 **Q. WHAT IS THE COMPOSITION OF YOUR PROXY GROUP?**

7 A. The screening criteria just discussed results in a proxy group consisting of the  
8 companies shown in Figure AEB-D-9 (and also in Attachment AEB-3).

9 **Figure AEB-D-9: Electric Utility Proxy Group**

Company	Ticker
ALLETE, Inc.	ALE
Alliant Energy Corporation	LNT
Ameren Corporation	AEE
American Electric Power Company, Inc.	AEP
Avista Corporation	AVA
Black Hills Corporation	BKH
CMS Energy Corporation	CMS
Duke Energy Corporation	DUK
Edison International	EIX
Entergy Corporation	ETR
Evergy, Inc.	EVRG
IDACORP, Inc.	IDA
NextEra Energy, Inc.	NEE
NorthWestern Corporation	NWE
OGE Energy Corporation	OGE
Otter Tail Corporation	OTTR
Portland General Electric Company	POR
Southern Company	SO
Wisconsin Energy Corporation	WEC

1 **Q. DO YOUR SCREENING CRITERIA RESULT IN A PROXY GROUP THAT IS**  
2 **COMPARABLE IN TERMS OF RISK TO PUBLIC SERVICE?**

3 A. Yes, they do. The overall purpose of developing a set of screening criteria is to  
4 select a proxy group of companies that align with the financial and operational  
5 characteristics of Public Service and that investors would view as comparable to  
6 the Company. I developed the screens and thresholds for each screen based on  
7 judgment with the intention of balancing the need to maintain a proxy group that is  
8 of sufficient size with the need to establish a proxy group of companies that are  
9 comparable in business and financial risk to Public Service.

10 **Q. DID YOU ADJUST THE OPERATING INCOME DATA FOR ANY OF THE**  
11 **COMPANIES INCLUDED IN YOUR PROXY GROUP TO REMOVE THE**  
12 **EFFECTS OF A ONE-TIME FINANCIAL EVENT?**

13 A. Yes. As shown in Attachment AEB-3, I relied on the three-year average of  
14 operating income from 2019 to 2021 for two of my proxy group screening criteria:  
15 (i) the total operating income from regulated operations; and (ii) regulated  
16 operating income from electric utility operations. The operating income data from  
17 2019 through 2021 for Otter Tail Corporation. (“Otter Tail”) was affected by a one-  
18 time financial event that caused its operating income from regulated electric  
19 operations to fall below 70 percent. The company notes in its 2021 SEC Form 10-  
20 K that:

21 Our 2021 earnings mix was impacted by significantly higher earnings  
22 in our Plastics segment as unique supply and demand conditions  
23 during the year in the PVC pipe industry led to earnings levels not  
24 previously experienced. We expect our earnings mix to return back  
25 to our targeted 70% from the Electric segment and 30% from

1 Manufacturing and Plastics segment over the long term as this  
2 industry conditions subside.<sup>31</sup>

3 Given these anomalous conditions and the exclusion of the 2021 results,

4 Otter Tail is included in the proxy group.

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<sup>31</sup> Otter Tail Corporation, 2021 SEC Form 10-K, p. 4.

1 **VII. COST OF EQUITY ESTIMATION**

2 **Q. PLEASE EXPLAIN THE RATE OF RETURN IN THE CONTEXT OF A**  
3 **REGULATED UTILITY.**

4 A. The regulatory construct requires that the regulatory agency, acting as a substitute  
5 for the competitive market, establish a rate of return for the company that is  
6 commensurate with the rate of return expected in the market for investments of  
7 similar risk. There can be adjustments to the ROE to reflect specific performance  
8 (e.g., positive adjustments recognizing strong management performance, cost  
9 savings and other important operational metrics, or negative adjustments reflecting  
10 poor performance in similar metrics). Absent any adjustments for these types of  
11 performance measures, the base ROE is intended to reflect the return that  
12 investors require in order to invest in utility assets rather than investing in  
13 enterprises of comparable risk in the industry or competitive market.

14 The overall rate of return for a regulated utility includes both the cost of debt  
15 and the cost of equity and is based on its weighted average cost of capital, whereby  
16 the costs of the individual sources of capital are weighted by their proportion in the  
17 capital structure. The appropriate cost of debt can be directly observed since  
18 utilities issue bonds in the market and investors determine the required return on  
19 those bonds to take on the risks associated with debt repayment. In contrast, the  
20 cost of equity is market-based and, therefore, must be estimated based on  
21 observable market data. It must also reflect that the risk to equity investors is  
22 greater than that of debt investors because debt investors have priority over equity  
23 investors in the event of the dissolution of the business. Accordingly, the returns

1 for comparable publicly-traded companies can be used to determine the  
2 appropriate cost of equity for a regulated utility operating company.

3 **Q. HOW IS THE COST OF EQUITY DETERMINED?**

4 A. The cost of equity is estimated by using multiple analytical techniques that rely on  
5 market data to quantify investors' required return requirements, adjusted for certain  
6 incremental costs and risks. Quantitative models produce a range of reasonable  
7 results that inform the selection of a market-required cost of equity. That selection  
8 must be based on a comprehensive review of relevant data and information, but it  
9 does not necessarily lend itself to a strict mathematical solution. The key  
10 consideration in determining the cost of equity is to ensure that the methodologies  
11 employed reasonably reflect investors' views of the financial markets in general  
12 and of the subject company (in the context of the proxy group) in particular.

13 **Q. WHAT METHODS DID YOU USE TO ESTIMATE PUBLIC SERVICE'S COST OF**  
14 **EQUITY?**

15 A. I considered the results of the Constant Growth DCF model, the Multi-Stage DCF  
16 model, the CAPM and ECAPM analyses, and the Bond Yield Plus Risk Premium  
17 methodology. I believe that a reasonable cost of equity estimate considers  
18 alternative methodologies, observable market data, and the reasonableness of  
19 their individual and collective results.



1       **A. Importance of Multiple Analytical Approaches**

2       **Q.    WHY IS IT IMPORTANT TO USE MORE THAN ONE ANALYTICAL**  
3       **APPROACH?**

4       A.    Because the cost of equity is not directly observable, it must be estimated based  
5           on both quantitative and qualitative information.  When faced with the task of  
6           estimating the cost of equity, analysts and investors are inclined to gather and  
7           evaluate as much relevant data as reasonably can be analyzed.  Several models  
8           have been developed to estimate the cost of equity, and I use multiple  
9           approaches.  As a practical matter, however, all of the models available for  
10          estimating the cost of equity are subject to limiting assumptions or other  
11          methodological constraints.  Consequently, many well-regarded finance texts  
12          recommend using multiple approaches when estimating the cost of equity.  For  
13          example, Copeland, Koller, and Murrin<sup>32</sup> suggest using the CAPM and Arbitrage  
14          Pricing Theory model, while Brigham and Gapenski<sup>33</sup> recommend the CAPM,  
15          DCF, and Bond Yield Plus Risk Premium approaches.  Consistent with the *Hope*  
16          finding, it is the analytical result, not the methodology employed, which is  
17          controlling in arriving at a cost of equity determination.

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<sup>32</sup> Tom Copeland, Tim Koller and Jack Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd Ed. (New York: McKinsey & Company, Inc., 2000), at 214.

<sup>33</sup> Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed. (Orlando: Dryden Press, 1994), at 341.

1 **Q. DO CURRENT MARKET CONDITIONS INCREASE THE IMPORTANCE OF**  
2 **USING MORE THAN ONE ANALYTICAL APPROACH?**

3 A. Yes. As previously discussed, interest rates have increased substantially from the  
4 lows during the COVID-19 pandemic, and upward pressure is expected to continue  
5 as the Federal Reserve continues to combat persistently high inflation. Given the  
6 relatively high utility stock prices and the inverse relationship between interest  
7 rates and utility share prices, the dividend yields of utilities are expected to  
8 increase over the near-term. Therefore, the current low dividend yields for utilities  
9 result in DCF cost of equity estimates that are understating the forward-looking  
10 cost of equity. The CAPM and Bond Yield Plus Risk Premium method offer some  
11 balance through the use of projected interest rates. Therefore, it is important to  
12 use multiple analytical approaches to ensure that the cost of equity results reflect  
13 the market conditions that are expected to prevail during the period that Public  
14 Service's rates will be in effect. Given the expectation that interest rates will  
15 increase, it is important to moderate the impact that the current lower interest rates  
16 are having on the cost of equity estimates, especially the DCF analysis, and where  
17 possible consider using projected market data in the models to estimate the return  
18 for the forward-looking period.

19 **Q. DOES THE COMMISSION SUPPORT THE USE OF MULTIPLE MODELS IN**  
20 **SETTING THE APPROPRIATE ROE?**

21 A. Yes. In the Company's 2019 Phase I Electric Rate Case, the Commission  
22 recognized that it was important to consider the results of multiple models and  
23 further stated that it was important that the model results "not be used woodenly,"

1 but rather as a guide along with other factors.<sup>34</sup> In addition, in the Company's most  
2 recent natural gas rate proceeding (*i.e.*, Proceeding No. 22AL-0046G), it is my  
3 understanding that the Commission indicated in its deliberations in that case that  
4 it would like the Company to include in the future the Multi-Stage DCF model for  
5 consideration. As such, I have conducted a Multi-Stage DCF analysis and  
6 consider the results of multiple models to confirm the reasonableness of the  
7 results.

8 **B. Constant Growth DCF Model**

9 **Q. PLEASE DESCRIBE THE DCF APPROACH.**

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

13 
$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_\infty}{(1+k)^\infty} \quad [1]$$

14 Where  $P_0$  represents the current stock price,  $D_1 \dots D_\infty$  are all expected  
15 future dividends, and  $k$  is the discount rate, or investor-required return. Equation  
16 [1] is a standard present value calculation that can be simplified and rearranged  
17 into the following form:

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

---

<sup>34</sup> Public Utilities Commission of the State of Colorado, Decision No. C20-0096, February 11, 2020, Proceeding No. 19AL-0268E, at para 101.

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

4 **Q. WHAT ASSUMPTIONS ARE REQUIRED FOR THE CONSTANT GROWTH DCF**  
5 **MODEL?**

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

11 **Q. WHAT MARKET DATA DID YOU USE TO CALCULATE THE DIVIDEND YIELD**  
12 **IN YOUR CONSTANT GROWTH DCF MODEL?**

13 A. The dividend yield in my Constant Growth DCF model is based on the proxy group  
14 companies' current annual dividend and average closing stock prices over the  
15 30-, 90-, and 180-trading days ended October 31, 2022.

16 **Q. DID YOU MAKE ANY ADJUSTMENTS TO THE DIVIDEND YIELD TO**  
17 **ACCOUNT FOR PERIODIC GROWTH IN DIVIDENDS?**

18 A. Yes. Since utility companies tend to increase their quarterly dividends at different  
19 times throughout the year, it is reasonable to assume that dividend increases will  
20 be evenly distributed over calendar quarters. Given that assumption, it is  
21 reasonable to apply one-half of the expected annual dividend growth rate for  
22 purposes of calculating the expected dividend yield component of the DCF model.  
23 This adjustment ensures that the expected first year dividend yield is, on average,

1 representative of the coming twelve-month period, and does not overstate the  
2 aggregated dividends to be paid during that time.

3 **Q. WHY IS IT IMPORTANT TO SELECT APPROPRIATE MEASURES OF LONG-  
4 TERM GROWTH IN APPLYING THE DCF MODEL?**

5 A. In its Constant Growth form, the DCF model (*i.e.*, Equation [2]) assumes a single  
6 long-term growth rate in perpetuity. In order to reduce the long-term growth rate  
7 to a single measure, one must assume that the dividend payout ratio remains  
8 constant and that earnings per share (“EPS”), dividends per share, and book value  
9 per share all grow at the same constant rate. Over the long run, however, dividend  
10 growth can only be sustained by earnings growth. Therefore, it is important to  
11 incorporate a variety of sources of long-term earnings growth rates into the  
12 Constant Growth DCF model.

13 **Q. WHAT SOURCES OF LONG-TERM GROWTH RATES DO YOU RELY ON IN  
14 YOUR CONSTANT GROWTH DCF MODEL?**

15 A. As shown in Attachment AEB-4, my Constant Growth DCF model incorporates  
16 three sources of long-term growth rates: (1) consensus long-term earnings growth  
17 estimates from Zacks Investment Research; (2) consensus long-term earnings  
18 growth estimates from Thomson First Call (provided by Yahoo! Finance); and (3)  
19 long-term earnings growth estimates from *Value Line*.

20 **Q. HOW DO YOU CALCULATE THE RANGE OF RESULTS FOR THE CONSTANT  
21 GROWTH DCF MODEL?**

22 A. I calculate a range of results by applying the lowest growth rate of First Call, Zacks,  
23 and *Value Line* growth for each of the proxy group companies, the average growth

1 rate of those three sources for each of the proxy group companies, and the highest  
2 growth rate of those three sources for each of the proxy group companies. I refer  
3 to each of the results as the “low growth rate,” “average growth rate” and “high  
4 growth rate” results.

5 **C. Multi-Stage DCF Model**

6 **Q. HOW DOES THE MULTI-STAGE FORM OF THE DCF MODEL DIFFER FROM**  
7 **THE CONSTANT GROWTH FORM OF THE DCF MODEL?**

8 A. As with the Constant Growth DCF model, the Multi-Stage form defines the cost of  
9 equity as the discount rate that sets the current price equal to the discounted value  
10 of future cash flows. However, the Multi-Stage DCF model, which is an extension  
11 of the Constant Growth form of the DCF, enables the analyst to specify different  
12 growth rates over multiple stages. The Multi-Stage DCF model allows for a gradual  
13 transition from the first-stage growth rate to the long-term growth rate, thereby  
14 avoiding the unrealistic assumption that growth changes abruptly between the first  
15 and final stages.

16 **Q. WHAT IS THE STRUCTURE OF YOUR MULTI-STAGE DCF MODEL?**

17 A. My Multi-Stage DCF model sets a company’s current stock price equal to the  
18 present value of future cash flows received over three “stages.” In all three stages,  
19 cash flows are equal to the annual dividend payments that stockholders receive.  
20 Stage One is a short-term growth period that consists of the first five years; Stage  
21 Two is a transition period from the short-term growth period to the long-term growth  
22 period (*i.e.*, years six through 10); and Stage Three is a long-term growth period  
23 that begins in year 11 and continues in perpetuity (*i.e.*, years 11 through 200). The

1 cost of equity is then calculated as the rate of return that results from the initial  
2 stock investment and the dividend payments over the analytical period.

3 **Q. WHAT GROWTH RATES ARE USED IN YOUR MULTI-STAGE DCF MODEL?**

4 A. As shown in Attachment AEB-5, I begin with the current annualized dividend as of  
5 October 31, 2022 for each proxy group company. In the first stage of the model,  
6 the current annualized dividend is escalated based on the average of the projected  
7 three- to five-year EPS growth rate estimates reported by Zacks, Thomson First  
8 Call, and *Value Line*. For the third stage, I rely on a long-term projected GDP  
9 growth rate. The second stage growth rate is a transition from the first stage  
10 growth rate to the long-term growth rate on a geometric average basis.

11 **Q. HOW DID YOU CALCULATE THE LONG-TERM GDP GROWTH RATE?**

12 A. As shown on Attachment AEB-5, the long-term growth rate of 5.55 percent is  
13 based on real GDP growth rate of 3.17 percent from 1929 through 2021,<sup>35</sup> and a  
14 projected inflation rate of 2.30 percent. The projected inflation rate is based on  
15 three measures: (1) the consensus estimate long-term projected growth rate in  
16 the CPI of 2.30 percent as published by *Blue Chip Financial Forecasts*;<sup>36</sup> (2) the  
17 compound annual growth rate of the CPI for all urban consumers for 2032-2050 of  
18 2.35 percent as projected by the Energy Information Administration (“EIA”);<sup>37</sup> and

---

<sup>35</sup> U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Table 1.1.1, October 27, 2022.

<sup>36</sup> *Blue Chip Financial Forecasts*, Vol. 41, No. 6, June 1, 2022, p. 14.

<sup>37</sup> U.S. Energy Information Administration, Annual Energy Outlook 2021, Table 20, Macroeconomic Indicators.

1 (3) the compound annual growth rate of the GDP chain-type price index for 2032-  
2 2050 of 2.26 percent as projected by the EIA.<sup>38</sup>

3 **Q. DO THE ASSUMPTIONS USED IN THE MULTI-STAGE DCF MODEL ADDRESS**  
4 **THE EFFECT OF CURRENTLY RELATIVELY HIGH UTILITY STOCK PRICES**  
5 **AND LOW UTILITY DIVIDEND YIELDS ON THE DCF RESULTS?**

6 A. No. While the Multi-Stage DCF model provides for changes in growth over time,  
7 it does not address the relatively high utility stock prices and low dividend yields  
8 for utility stocks and the effect of those low dividend yields on the DCF model. As  
9 a result, the cost of equity resulting from these assumptions is likely understated.  
10 For that reason, I have also considered the results of risk-premium based  
11 methodologies, which I will discuss later in my direct testimony.

12 **Q. PLEASE SUMMARIZE THE RESULTS OF YOUR DCF ANALYSES.**

13 A. Figure AEB-D-10 summarizes the results of both the Constant Growth DCF  
14 and Multi-Stage DCF. Depending on the time period over which the average stock  
15 prices for the dividend yield are calculated, and using the average growth rates,  
16 the Constant Growth DCF results range from 9.19 to 9.66 percent, with the mean  
17 results being higher than the median results. Using the high growth rates, the  
18 results range from 9.95 percent to 11.03 percent, again, with the mean results  
19 being higher than the median results.

---

<sup>38</sup> *Id.*



1

**Figure AEB-D-10: Summary of DCF Results<sup>39</sup>**

<b>Constant Growth DCF</b>			
	Minimum Gwth Rate	Average Gwth Rate	Maximum Gwth Rate
Mean Results:			
30-Day Average	8.43%	9.66%	11.03%
90-Day Average	8.16%	9.39%	10.76%
180-Day Average	8.14%	9.36%	10.73%
Average	8.25%	9.47%	10.84%
Median Results:			
30-Day Average	8.10%	9.38%	10.43%
90-Day Average	7.81%	9.19%	10.02%
180-Day Average	7.88%	9.33%	9.95%
Average	7.93%	9.30%	10.14%
<b>Multi-Stage DCF</b>			
	Minimum Gwth Rate	Average Gwth Rate	Maximum Gwth Rate
Mean Results:			
30-Day Average	9.40%	9.73%	10.16%
90-Day Average	9.11%	9.42%	9.83%
180-Day Average	9.09%	9.40%	9.80%
Mean	9.20%	9.51%	9.93%
Median Results:			
30-Day Average	9.40%	9.61%	9.81%
90-Day Average	9.14%	9.32%	9.39%
180-Day Average	9.12%	9.31%	9.36%
Median	9.22%	9.41%	9.52%

2 **Q. WHAT ARE YOUR CONCLUSIONS ABOUT THE RESULTS OF THE DCF**  
 3 **MODELS?**

4 A. Since utility stocks are expected to underperform the broader market over the  
 5 near-term as interest rates increases, it is important to consider the results of the  
 6 DCF models with caution. This means that the results of the DCF models, which

<sup>39</sup> Results shown in Figure AEB-D-10 do not include flotation costs.

1           rely on historical stock prices, are below where they would be expected to be going  
2           forward during the period in which the rates for the Company will be in effect.  
3           Therefore, while I have given weight to the results of the DCF models, prospective  
4           market conditions warrant consideration of other cost of equity estimation models  
5           such as the CAPM and ECAPM, which may better reflect expected market  
6           conditions, and my recommendation also gives weight to the results of other cost  
7           of equity estimation models.

8           **D. CAPM Analysis**

9           **Q. PLEASE BRIEFLY DESCRIBE THE CAPITAL ASSET PRICING MODEL.**

10          A.       The CAPM is a risk premium approach that estimates the cost of equity for a given  
11                  security as a function of a risk-free return plus a risk premium to compensate  
12                  investors for the non-diversifiable or “systematic” risk of that security.<sup>40</sup> This  
13                  second component is the product of the market risk premium and the beta  
14                  coefficient, which measures the relative riskiness of the security being evaluated.

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

---

<sup>40</sup> 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 optimization.

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

1           Where:

2            $K_e$  = the required market ROE;

3            $\beta$  = beta coefficient of an individual security;

4            $r_f$  = the risk-free ROR; and

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

6           In this specification, the term  $(r_m - r_f)$  represents the market risk premium.

7           According to the theory underlying the CAPM, since unsystematic risk can be  
8           diversified away, investors should only be concerned with systematic risk.

9           Systematic risk is measured by beta, which is a measure of the volatility of a  
10          security as compared to the overall market. Beta is defined as:

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

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

17   **Q.   WHAT RISK-FREE RATE DID YOU USE IN YOUR CAPM ANALYSIS?**

18   A.   I relied on three sources for my estimate of the risk-free rate: (1) the current 30-  
19          day average yield on 30-year Treasury bonds of 3.92 percent;<sup>41</sup> (2) the projected

---

<sup>41</sup> Bloomberg Professional as of October 31, 2022.

1 30-year Treasury yield for Q1/2023 – Q1/2024 of 4.00 percent;<sup>42</sup> and (3) the  
2 average projected 30-year Treasury bond yield for the period 2022 through 2026  
3 of 3.80 percent.<sup>43</sup>

4 **Q. WOULD YOU PLACE MORE WEIGHT ON ONE OF THESE SCENARIOS?**

5 A. Yes. Based on current market conditions, I place more weight on the results of the  
6 projected yields on the 30-year Treasury bonds. As discussed previously, the  
7 estimation of the cost of equity in this case should be forward-looking because it  
8 is the return that investors would receive over the future rate period. Therefore,  
9 the inputs and assumptions used in the CAPM analysis should reflect the  
10 expectations of the market at that time. While I have included the results of a  
11 CAPM analysis that relies on a 30-day historical average risk-free rate, doing so  
12 fails to take into consideration the effect of the market's expectations for interest  
13 rate increases on the cost of equity.

14 **Q. WHAT BETA COEFFICIENTS DID YOU USE IN YOUR CAPM ANALYSIS?**

15 A. As shown in Attachment AEB-6, I used the beta coefficients for the proxy group  
16 companies as reported by Bloomberg and *Value Line*. The beta coefficients  
17 reported by Bloomberg are calculated using ten years of weekly returns relative to  
18 the S&P 500 Index. The beta coefficients reported by *Value Line* are calculated  
19 based on five years of weekly returns relative to the New York Stock Exchange  
20 Composite Index. Additionally, as shown in Attachments AEB-6 and AEB-7, I also  
21 considered an additional CAPM analysis that relies on the long-term average beta

---

<sup>42</sup> Blue Chip Financial Forecasts, Vol. 41, No. 11, November 1, 2022, at 2.

<sup>43</sup> Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14.

1 coefficient reported by *Value Line* for the companies in my proxy group from 2013  
2 through 2021.

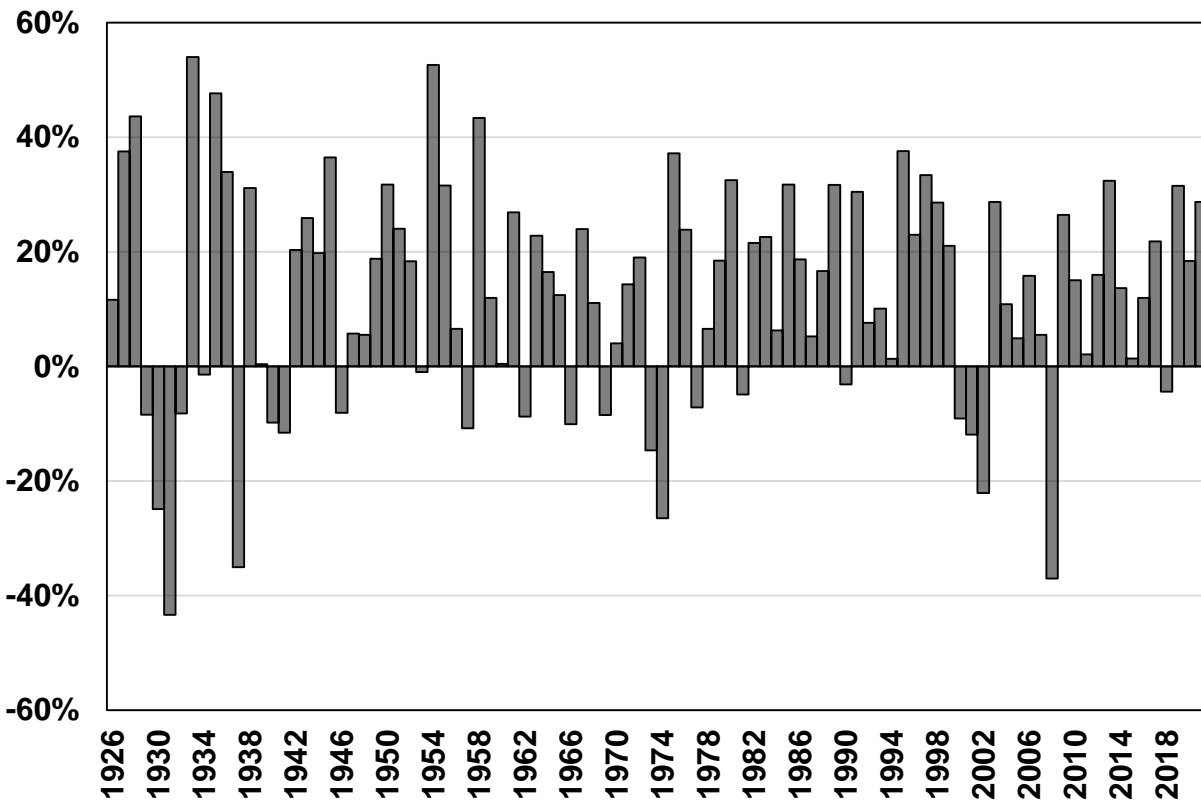
3 **Q. HOW DID YOU ESTIMATE THE MARKET RISK PREMIUM IN THE CAPM?**

4 A. I estimated the market risk premium as the difference between the implied  
5 expected equity market return on the S&P 500 Index and the risk-free rate. The  
6 expected return on the S&P 500 Index is calculated using the Constant Growth  
7 DCF model discussed earlier in my testimony for the companies in the S&P 500  
8 Index for which dividend yields and *Value Line* long-term EPS projections are  
9 available. As shown in Attachment AEB-8, based on an estimated market  
10 capitalization-weighted dividend yield of 1.84 percent and a weighted long-term  
11 growth rate of 10.82 percent, the estimated required market return for the S&P 500  
12 Index is 12.76 percent. The implied market risk premium over the risk-free rates  
13 evaluated (*i.e.*, the current, near-term projected and longer-term projected 30-year  
14 U.S. Treasury bond yield) ranges from 8.76 percent to 8.96 percent.

15 **Q. HOW DOES THE EXPECTED MARKET RETURN YOU HAVE CALCULATED  
16 COMPARE TO OBSERVED HISTORICAL MARKET RETURNS?**

17 A. Given the range of annual equity returns that have been observed over the past  
18 century as shown in Figure AEB-D-11, a current expected market return of 12.76  
19 percent is consistent with the historical returns. Approximately 52 percent of the  
20 realized equity returns over this period were at this level or greater.

1 **Figure AEB-D-11: Realized U.S. equity market returns (1926-2021)<sup>44</sup>**



2 **Q. DID YOU CONSIDER ANOTHER FORM OF THE CAPM?**

3 A. Yes, I did. I have also considered the results of an ECAPM<sup>45</sup> in estimating the cost  
4 of equity for Public Service. The ECAPM calculates the product of the adjusted  
5 beta coefficient and the market risk premium, and applies a weight of 75.00 percent  
6 to that result. The model then applies a 25.00 percent weight to the market risk  
7 premium, without any effect from the beta coefficient. The results of the two  
8 calculations are summed, along with the risk-free rate, to produce the ECAPM  
9 result, as noted in Equation [5] below:

<sup>44</sup> Depicts total annual returns on large company stocks, as reported in the 2021 Kroll S&P 500 Yearbook.

<sup>45</sup> See, e.g., Roger A. Morin, *New Regulatory Finance*, Public Utilities Reports, Inc., 2006, at 189.

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

1           Where:

2                  $k_e$  = the required market ROE

3                  $\beta$  = beta coefficient of an individual security

4                  $r_f$  = the risk-free rate of return

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

6           In essence, the Empirical form of the CAPM addresses the tendency of the  
7           “traditional” CAPM to underestimate the cost of equity for companies with relatively  
8           low beta coefficients such as regulated utilities. In that regard, the ECAPM is not  
9           redundant to the use of adjusted betas; rather, it recognizes the results of  
10          academic research indicating that the risk-return relationship is different (in  
11          essence, flatter) than estimated by the CAPM, and that the CAPM underestimates  
12          the “alpha,” or the constant return term.<sup>46</sup>

13          Consistent with the CAPM, my application of the ECAPM also relies on the  
14          forward-looking market risk premium estimates, the current, near-term and longer-  
15          term 30-year Treasury yields as the risk-free rate, and the Bloomberg, *Value Line*  
16          and long-term average beta coefficients.

17   **Q.   WHAT ARE THE RESULTS OF YOUR CAPM AND ECAPM ANALYSES?**

18   A.   As shown in Figure AEB-D-12, my traditional CAPM analysis produces a range of  
19   returns from 10.51 percent to 11.72 percent, and the ECAPM analysis produces a  
20   range of returns from 11.07 percent to 11.98 percent.

---

<sup>46</sup> *Id.* at 191.

1

**Figure AEB-D-12: CAPM and ECAPM Results**

	Current 30-Day Avg 30-Year Treasury Yield	Near-Term Forecast 30-Year Treasury Yield	Longer-Term Forecast 30-Year Treasury Yield
<b>CAPM:</b>			
Value Line Beta	11.71%	11.72%	11.70%
Bloomberg Beta	11.17%	11.18%	11.14%
Long-term Avg. Beta	10.54%	10.56%	10.51%
<b>ECAPM:</b>			
Value Line Beta	11.97%	11.98%	11.96%
Bloomberg Beta	11.56%	11.58%	11.55%
Long-term Avg. Beta	11.09%	11.11%	11.07%

2

**E. Bond Yield Plus Risk Premium Analysis**

3

**Q. PLEASE DESCRIBE THE BOND YIELD PLUS RISK PREMIUM APPROACH.**

4

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 a bondholder. In other words, because returns to equity holders have greater risk than returns to bondholders, equity investors must be compensated to bear that risk. Risk premium approaches, therefore, estimate the cost of equity as the sum of the equity risk premium and the yield on a particular class of bonds. In my analysis, I used actual authorized returns for vertically-integrated utility companies as the historical measure of the cost of equity to determine the risk premium.

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1 **Q. ARE THERE OTHER CONSIDERATIONS THAT SHOULD BE ADDRESSED IN**  
2 **CONDUCTING THIS ANALYSIS?**

3 A. Yes. It is important to recognize both academic literature and market evidence  
4 indicating that the equity risk premium (as used in this approach) is inversely  
5 related to the level of interest rates. That is, as interest rates increase, the equity  
6 risk premium decreases, and vice versa. Consequently, it is important to develop  
7 an analysis that: (1) reflects the inverse relationship between interest rates and the  
8 equity risk premium; and (2) relies on recent and expected market conditions.  
9 Such an analysis can be developed based on a regression of the risk premium as  
10 a function of U.S. Treasury bond yields. If authorized ROEs for vertically-  
11 integrated electric utilities serve as the measure of required equity returns and the  
12 yield on the long-term U.S. Treasury bond serve as the relevant measure of  
13 interest rates, the risk premium simply would be the difference between those two  
14 points.<sup>47</sup>

15 **Q. IS THE BOND YIELD PLUS RISK PREMIUM ANALYSIS RELEVANT TO**  
16 **INVESTORS?**

17 A. Yes. Investors are aware of authorized ROEs in other jurisdictions, and they  
18 consider those authorizations as a benchmark for a reasonable level of equity  
19 returns for utilities of comparable risk operating in other jurisdictions. Because my

---

<sup>47</sup> See e.g., S. Keith Berry, *Interest Rate Risk and Utility Risk Premia during 1982-93*, Managerial and Decision Economics, Vol. 19, No. 2 (March 1998), in which the author used a methodology similar to the regression approach described below, including using allowed ROEs as the relevant data source, and came to similar conclusions regarding the inverse relationship between risk premia and interest rates. See also Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholders Required Rates of Return*, Financial Management, Spring 1986, at 66.

1 Bond Yield Plus Risk Premium analysis is based on authorized ROEs for utility  
2 companies relative to corresponding Treasury yields, it provides relevant  
3 information to assess the return expectations of investors.

4 **Q. WHAT DID YOUR BOND YIELD PLUS RISK PREMIUM ANALYSIS REVEAL?**

5 A. As shown in Figure AEB-D-13, from 1992 through October 2022, there was a  
6 strong negative relationship between equity risk premia and interest rates. To  
7 estimate that relationship, I conducted a regression analysis using the following  
8 equation:

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

9 Where:

10 RP = Risk Premium (difference between authorized ROEs and the  
11 yield on 30-year U.S. Treasury bonds)

12  $a$  = intercept term

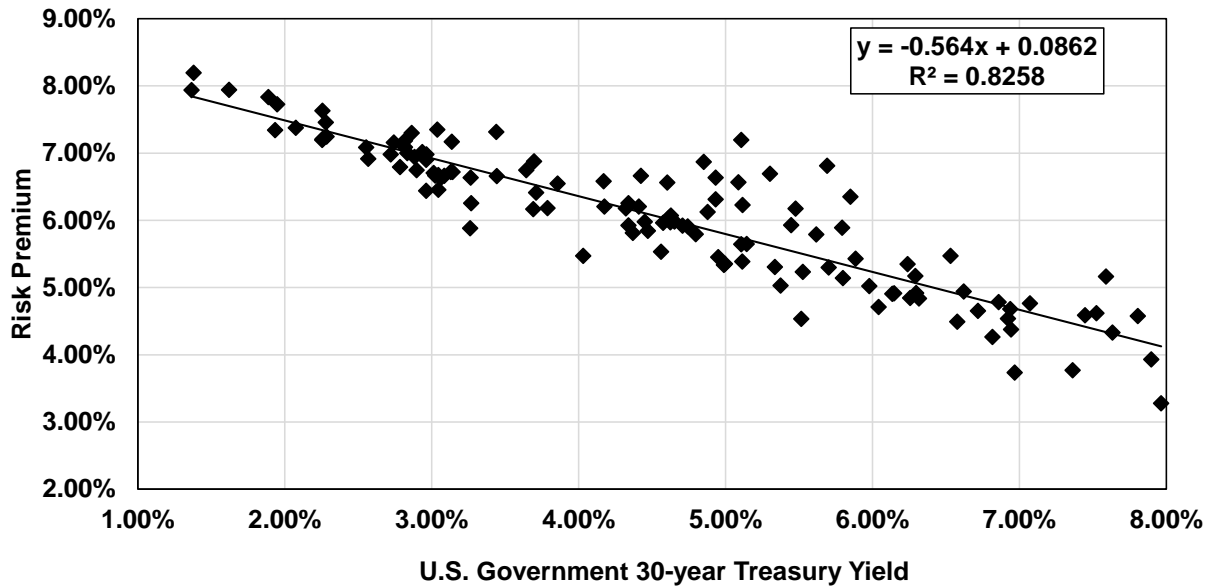
13  $b$  = slope term

14  $T$  = 30-year U.S. Treasury bond yield

15 Data regarding authorized ROEs were derived from more than 700 natural  
16 gas utility rate cases from 1992 through October 2022 as reported by Regulatory  
17 Research Associates ("RRA"). The equation's coefficients are statistically  
18 significant at the 99.00 percent level.

1

**Figure AEB-D-13: Risk Premium Results**



2 **Q. WHAT ARE THE RESULTS OF YOUR BOND YIELD PLUS RISK PREMIUM**  
 3 **ANALYSIS?**

4 A. The results of the Bond Yield Plus Risk Premium are shown in Figure AEB-D-14  
 5 (and which are also shown in Attachment AEB-9).

6 **Figure AEB-D-14: Results of the Bond Yield Plus Risk Premium Model**

Current 30-Day Avg 30-Year Treasury Yield	Near-Term Forecast 30-Year Treasury Yield	Longer-Term Forecast 30-Year Treasury Yield
10.33%	10.36%	10.27%

7 **Q. HOW DO THE RESULTS OF THE BOND YIELD RISK PREMIUM ANALYSIS**  
 8 **INFORM YOUR RECOMMENDED ROE FOR PUBLIC SERVICE?**

9 A. In conjunction with the other cost of equity models that I have discussed, I have  
 10 considered the results of the Bond Yield Risk Premium analysis in setting my  
 11 recommended ROE range for Public Service. As noted above, investors consider

1 the authorized ROE of a utility when assessing the risk of that utility as compared  
2 to utilities of comparable risk operating in other jurisdictions. The risk premium  
3 analysis accounts for this comparison by estimating the return expectations of  
4 investors based on the current and past authorized ROEs of vertically-integrated  
5 utilities across the U.S.

1 **VIII. REGULATORY AND BUSINESS RISKS**

2 **Q. DO THE RESULTS OF THE DCF, CAPM, ECAPM, AND RISK PREMIUM**  
3 **RESULTS FOR THE PROXY GROUP PROVIDE AN APPROPRIATE ESTIMATE**  
4 **OF THE COST OF EQUITY FOR PUBLIC SERVICE?**

5 A. No. These results provide only a range of the appropriate estimate of Public  
6 Service's cost of equity. Several additional factors must be considered when  
7 determining where the authorized ROE for the Company should fall within the  
8 range of analytical results. These risk factors, discussed below, should be  
9 considered with respect to their overall effect on Public Service's risk profile  
10 relative to the proxy group.

11 **A. Regulatory Risks**

12 **Q. PLEASE EXPLAIN HOW THE REGULATORY ENVIRONMENT AFFECTS**  
13 **INVESTORS' RISK ASSESSMENTS?**

14 A. The ratemaking process is premised on the principle that, for investors and  
15 companies to commit the capital needed to provide safe and reliable utility service,  
16 the subject utility must have the opportunity to recover the return of, and the  
17 market-required return on, invested capital. Regulatory authorities recognize that  
18 because utility operations are capital intensive, regulatory decisions should enable  
19 the utility to attract capital at reasonable terms, and that doing so balances the  
20 long-term interests of investors and customers. Utilities must finance their  
21 operations and thus require the opportunity to earn a reasonable return on their  
22 invested capital to maintain their financial profiles. Public Service is no exception,

1 and in that respect, the regulatory environment is one of the most important factors  
2 considered in both debt and equity investors' risk assessments.

3 From the perspective of debt investors, the authorized return should enable  
4 the utility to generate the cash flow needed to meet its near-term financial  
5 obligations, make the capital investments needed to maintain and expand its  
6 systems, and maintain the necessary levels of liquidity to fund unexpected events.  
7 This financial liquidity must be derived not only from internally generated funds,  
8 but also by efficient access to capital markets. Moreover, because fixed income  
9 investors have many investment alternatives, even within a given market sector, a  
10 utility's financial profile must be adequate on a relative basis to ensure its ability to  
11 attract capital under a variety of economic and financial market conditions.

12 Equity investors require that the authorized return be adequate to provide a  
13 risk-comparable return on the equity portion of the utility's capital investments.  
14 Because equity investors are the residual claimants on the utility's cash flows (*i.e.*,  
15 the equity return is subordinate to interest payments), they are particularly  
16 concerned with the strength of regulatory support and its effect on future cash  
17 flows.

18 **Q. PLEASE EXPLAIN HOW CREDIT RATING AGENCIES CONSIDER**  
19 **REGULATORY RISK IN ESTABLISHING A COMPANY'S CREDIT RATING?**

20 A. Both S&P and Moody's consider the overall regulatory framework in establishing  
21 credit ratings. Moody's establishes credit ratings based on four key factors: (1)  
22 regulatory framework; (2) the ability to recover costs and earn returns; (3)  
23 diversification; and (4) financial strength, liquidity and key financial metrics. Of

1 these criteria, regulatory framework and the ability to recover costs and earn  
2 returns are each given a broad rating factor of 25.00 percent. Therefore, Moody's  
3 assigns regulatory risk a 50.00 percent weighting in the overall assessment of  
4 business and financial risk for regulated utilities.<sup>48</sup>

5 S&P also identifies the regulatory framework as an important factor in credit  
6 ratings for regulated utilities, stating: "One significant aspect of regulatory risk that  
7 influences credit quality is the regulatory environment in the jurisdictions in which  
8 a utility operates."<sup>49</sup> S&P identifies four specific factors that it uses to assess the  
9 credit implications of the regulatory jurisdictions of investor-owned regulated  
10 utilities: (1) regulatory stability; (2) tariff-setting procedures and design; (3)  
11 financial stability; and (4) regulatory independence and insulation.<sup>50</sup>

12 Regulatory decisions regarding the authorized ROE and capital structure  
13 have direct consequences for the subject utility's internal cash flow generation  
14 (sometimes referred to as "Funds from Operations" ("FFO") or "Cash from  
15 Operations" ("CFO")). Because credit ratings are intended to reflect the ability to  
16 meet financial obligations as they come due, the ability to generate the cash flows  
17 required to meet those obligations (and to provide an additional amount for  
18 unexpected events) is of critical importance to debt investors. Two of the most  
19 important metrics used to assess that ability are the ratios of FFO to debt, and FFO

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<sup>48</sup> Moody's Investors Service, Rating Methodology: Regulated Electric and Gas Utilities, June 23, 2017, at 4.

<sup>49</sup> Standard & Poor's Global Ratings, Ratings Direct, U.S. and Canadian Regulatory Jurisdictions Support Utilities' Credit Quality—But Some More So Than Others, June 25, 2018, at 2.

<sup>50</sup> *Id.*, at 1.

1 to interest expense, both of which are directly affected by regulatory decisions  
2 regarding the appropriate rate of return and capital structure.

3 **Q. HOW DOES THE REGULATORY ENVIRONMENT IN WHICH A UTILITY**  
4 **OPERATES AFFECT ITS ACCESS TO AND COST OF CAPITAL?**

5 A. The regulatory environment can significantly affect both the access to and cost of  
6 capital in several ways. First, the proportion and cost of debt capital available to  
7 utility companies are influenced by the rating agencies' assessment of the  
8 regulatory environment. As noted by Moody's, "[f]or rate regulated utilities, which  
9 typically operate as a monopoly, the regulatory environment and how the utility  
10 adapts to that environment are the most important credit considerations."<sup>51</sup>  
11 Moody's further highlighted the relevance of a stable and predictable regulatory  
12 environment to a utility's credit quality, noting: "[b]roadly speaking, the Regulatory  
13 Framework is the foundation for how all the decisions that affect utilities are made  
14 (including the setting of rates), as well as the predictability and consistency of  
15 decision-making provided by that foundation."<sup>52</sup>

16 **Q. HAVE YOU CONDUCTED AN ANALYSIS OF THE REGULATORY**  
17 **FRAMEWORK IN COLORADO FOR PUBLIC SERVICE'S ELECTRIC UTILITY**  
18 **BUSINESS RELATIVE TO THE JURISDICTIONS IN WHICH THE COMPANIES**  
19 **IN YOUR PROXY GROUP OPERATE?**

20 A. Yes. I have evaluated the regulatory framework in Colorado based on four factors  
21 that are important in terms of providing a regulated utility a reasonable opportunity

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<sup>51</sup> Moody's Investors Service, Rating Methodology: Regulated Electric and Gas Utilities, June 23, 2017, at 6.

<sup>52</sup> *Id.*



1 to earn its authorized ROE. These factors are: (1) the test year convention for  
2 ratemaking (*i.e.*, forecast vs. historical test year); (2) the method for determining  
3 rate base for ratemaking (*i.e.*, average vs. year-end rate base); (3) the use of  
4 revenue decoupling or other mechanisms that mitigate volumetric risk; (4) the  
5 prevalence of cost recovery between rate cases, including capital cost and fuel  
6 cost recovery mechanism; and (5) most recent authorized ROE.

7 **Q. WHAT ARE THE RESULTS OF YOUR ANALYSIS?**

8 A. The results of my regulatory risk assessment are shown in Attachment AEB-11  
9 and are summarized as follows:

10 Test Year Convention: Public Service's rates are currently based on a  
11 historical test year, although Colorado statute allows for the use of a  
12 forecasted test year. Approximately 49 percent of the utility operating  
13 subsidiaries of the companies in the proxy group use a fully or partial  
14 forecast test year, while the remainder use a historical test year. The  
15 Company is requesting the use of a projected rate base that is consistent  
16 with the proxy group companies.

17 Volumetric Risk/Decoupling: Public Service currently has a decoupling  
18 mechanism that applies to a subset of its residential and metered small  
19 commercial and industrial customers, but it expires at the end of 2023. This  
20 program, while somewhat limited, is consistent with the proxy group,  
21 whereby 50 percent of the proxy group operating companies also have  
22 some form of protection against volumetric risk. Public Service does not  
23 have formula-based rates or straight-fixed variable rate design, which is  
24 also consistent with the operating subsidiaries of the proxy group.

25 Capital Cost Recovery: The Company currently has some cost recovery  
26 riders which are generally consistent with the operating subsidiaries of the  
27 proxy group. Approximately 51 percent of these utilities also have capital  
28 cost recovery mechanisms.

1 **Q. IS THERE EVIDENCE THAT PUBLIC SERVICE HAS BEEN UNABLE TO EARN**  
2 **ITS AUTHORIZED RETURN ON EQUITY FOR THE ELECTRIC UTILITY**  
3 **BUSINESS?**

4 A. Yes. As shown in Figure AEB-D-15, Public Service's electric utility business has  
5 persistently and substantially under-earned its authorized ROE every year for the  
6 past 5 years. Over this period, the average earned ROE on the Company's electric  
7 utility business was 8.48 percent, as compared with the average authorized ROE  
8 of 9.62 percent, for an average under-earning of 114 basis points per year.

9 **Figure AEB-D-15: Public Service's Earned vs. Authorized ROE for Its Electric**  
10 **Operations**

Year	Earned ROE	Authorized ROE	Difference - Earned v. Authorized
2021	8.48%	9.30%	-0.82%
2020	8.73%	9.30%	-0.57%
2019	7.62%	9.83%	-2.21%
2018	8.75%	9.83%	-1.08%
2017	8.81%	9.83%	-1.02%
5-Year Avg.	8.48%	9.62%	-1.14%

11 **Q. HAVE THE RATING AGENCIES COMMENTED ON THE COLORADO**  
12 **REGULATORY JURISDICTION?**

13 A. Yes. S&P's most recent assessment indicates that while consistency within the  
14 ratemaking process in Colorado has weakened, the regulatory framework is  
15 generally credit supportive.

16 We believe that consistency within Colorado's rate making process  
17 has weakened. We view our regulatory jurisdiction assessment on  
18 Colorado as very credit supportive. This reflects the authorization of  
19 below-average returns and the commission's recent reliance on the  
20 average cost rate base instead of the historically used original year-

1 end cost rate base. Additionally, the commission has relied upon  
2 historical test periods for rate making purposes even when using  
3 forecast test periods is permitted by law. Further, authorized capital  
4 structure parameters, including return on equity (ROE), for investor-  
5 owned utilities, have been below industry norms in recent  
6 proceedings. We view these actions as negative for credit quality as  
7 they exacerbate regulatory lag. Consistent with our assessment of  
8 Colorado's regulatory jurisdiction and our view that we assess  
9 PSCo's effective management of regulatory risk in line with peers,  
10 we view PSCo's competitive position as strong. Overall, we expect  
11 the company's effective management of regulatory risk to persist,  
12 despite our belief that the regulatory environment in Colorado has  
13 weakened. Our business risk assessment remains excellent.<sup>53</sup>

14 S&P also notes that there is downside risk if rate case outcomes are weaker  
15 than expected:

16 We could lower the rating on Xcel and its subsidiaries, including  
17 PSCo, if Xcel's financial ratios weaken and consistently reflect  
18 adjusted FFO to debt at or below 15%. This would most likely occur  
19 if rate-case outcomes are weaker than expected and capital  
20 spending materially rises.<sup>54</sup>

21 Likewise, S&P also notes that it could, "raise the ratings if Xcel improves its  
22 collective ability to manage regulatory risk across its jurisdictions, resulting in a  
23 consistent improvement in its business risk."<sup>55</sup>

24 Similarly, Moody's noted its rating reflect the expectation that the regulatory  
25 environment will continue to remain credit supportive, despite the uncertainty faced  
26 with the recovery of the February 2021 fuel costs from Winter Storm Uri, and that  
27 a downgrade could result if there was a deterioration in the credit supportiveness  
28 of the regulatory environment.<sup>56</sup>

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<sup>53</sup> S&P Global Ratings, Public Service Company of Colorado, July 26, 2022, p. 5.

<sup>54</sup> S&P Global Ratings, Public Service Company of Colorado, July 26, 2022, p. 2.

<sup>55</sup> S&P Global Ratings, Public Service Company of Colorado, July 26, 2022, p. 3.

<sup>56</sup> Moody's Investors Service, Credit Opinion, Public Service Company of Colorado, December 24, 2021, pp. 2-3.

1 **Q. HAVE YOU DEVELOPED ANY ANALYSES TO EVALUATE THE**  
2 **REGULATORY ENVIRONMENT IN COLORADO AS COMPARED TO THE**  
3 **JURISDICTIONS IN WHICH THE OPERATING UTILITY SUBSIDIARIES OF**  
4 **THE COMPANIES IN THE PROXY GROUP OPERATE?**

5 A. Yes. I have conducted two additional analyses to compare the regulatory  
6 framework of Colorado to the jurisdictions in which the operating utility subsidiaries  
7 of the companies in the proxy group operate. Specifically, I considered two  
8 different rankings: (1) the Regulatory Research Associates (“RRA”) ranking of  
9 regulatory jurisdictions; and (2) S&P’s ranking of the credit supportiveness of  
10 regulatory jurisdictions.

11 **Q. PLEASE EXPLAIN HOW YOU USED THE RRA RATINGS TO COMPARE**  
12 **COLORADO TO THE REGULATORY JURISDICTIONS OF THE OPERATING**  
13 **UTILITY SUBSIDIARIES OF THE COMPANIES IN THE PROXY GROUP?**

14 A. RRA develops their ranking based on their assessment of how investors perceive  
15 the regulatory risk associated with ownership of utility securities in that jurisdiction,  
16 specifically reflecting their assessment of the probable level and quality of earnings  
17 to be realized by the State’s utilities as a result of regulatory, legislative, and court  
18 actions. RRA assigns a ranking for each regulatory jurisdiction between “Above  
19 Average/1” to “Below Average/3,” with nine total rankings between these  
20 categories. I applied a numeric ranking system to the RRA rankings with “Above  
21 Average/1” assigned the highest ranking (“1”) and “Below Average/3” assigned the  
22 lowest ranking (“9”). As shown in Attachment AEB-12, the Colorado regulatory

1 environment is ranked as Average/1, while the regulatory environment of the proxy  
2 group is ranked, on average, slightly lower between “Average/1” and “Average/2.”

3 **Q. HOW DID YOU CONDUCT YOUR ANALYSIS OF THE S&P CREDIT**  
4 **SUPPORTIVENESS?**

5 A. S&P classifies the regulatory jurisdictions into five categories ranging from “Credit  
6 Supportive” to “Most Credit Supportive” based on the level of credit  
7 supportiveness. Similar to the RRA regulatory ranking analysis just discussed, I  
8 assigned a numerical ranking to each jurisdiction ranked by S&P, from most credit  
9 supportive (“1”) to credit supportive (“5”). As shown in Attachment AEB-13,  
10 Colorado is ranked as a “3” (*i.e.*, Very Credit Supportive), while the regulatory  
11 jurisdictions of the proxy group is ranked, on average, slightly better being between  
12 a “2” (*i.e.*, Highly Credit Supportive) and a “3” (*i.e.*, Very Credit Supportive).

13 **B. Capital Expenditure Risks**

14 **Q. IS IT IMPORTANT FOR ELECTRIC UTILITIES SUCH AS THE COMPANY TO**  
15 **HAVE ACCESS TO CAPITAL AT REASONABLE TERMS?**

16 A. Yes. Electric utilities are one of the most capital-intensive sectors of the S&P 500.  
17 To fund the significant capital expenditures needed to maintain, expand, and  
18 modernize existing infrastructure, electric utilities require sufficient internally  
19 generated cash flow and ongoing access to investor-supplied capital. The  
20 authorized return is a driver of both internally generated cash flow and the ability  
21 to access capital at reasonable terms. Therefore, it is critically important that  
22 regulation provide predictable, adequate, and achievable allowed returns that  
23 support the financial integrity of the utility.

1           As discussed later herein, Public Service is embarking on an aggressive  
2 plan to exceed Colorado's carbon reduction and clean energy goals. Although  
3 many of those investments and decisions will be at issue in future proceedings,  
4 the Commission should bear in mind that the Company's success in achieving the  
5 state's clean energy mandates relies principally on maintaining a strong financial  
6 profile. Because that transition will occur over the coming years, supportive  
7 regulation is vitally important to Public Service's ability to access capital and  
8 achieve its aggressive emission reduction goals.

9 **Q. WHAT ARE THE COMPANY'S PROJECTED CAPITAL EXPENDITURE**  
10 **REQUIREMENTS?**

11 A. Public Service currently projects it will spend approximately \$5.6 billion from 2023  
12 to 2026 on its electric utility operations, excluding potential incremental investment,  
13 including \$0.5 to \$1.0 billion associated with network upgrades and  
14 interconnections associated with the implementation of the resource plan.<sup>57</sup>

15 **Q. HOW DO THE COMPANY'S PROJECTED CAPITAL EXPENDITURE**  
16 **REQUIREMENTS COMPARE TO THE PROXY GROUP COMPANIES?**

17 A. As shown in Attachment AEB-10, Public Service's projected capital expenditures  
18 represent approximately 53.5 percent of its 2021 net electric plant balance, and  
19 the median of the proxy group is 51.1 percent. Therefore, Public Service's  
20 projected capital expenditures are moderately higher than the median of the proxy  
21 group.

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<sup>57</sup> Xcel Energy, Investor Presentation, August, pp. 71-72.

1 **Q. HOW IS THE COMPANY'S RISK PROFILE AFFECTED BY ITS SUBSTANTIAL**  
2 **CAPITAL EXPENDITURE REQUIREMENTS?**

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

8 **Q. DO CREDIT RATING AGENCIES RECOGNIZE THE RISKS ASSOCIATED**  
9 **WITH ELEVATED LEVELS OF CAPITAL EXPENDITURES?**

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

14 When applicable, a jurisdiction's willingness to support large capital  
15 projects with cash during construction is an important aspect of our  
16 analysis. This is especially true when the project represents a major  
17 addition to rate base and entails long lead times and technological  
18 risks that make it susceptible to construction delays. Broad support  
19 for all capital spending is the most credit-sustaining. Support for only  
20 specific types of capital spending, such as specific environmental  
21 projects or system integrity plans, is less so, but still favorable for  
22 creditors. Allowance of a cash return on construction work-in-  
23 progress or similar ratemaking methods historically were  
24 extraordinary measures for use in unusual circumstances, but when  
25 construction costs are rising, cash flow support could be crucial to  
26 maintain credit quality through the spending program. Even more  
27 favorable are those jurisdictions that present an opportunity for a  
28 higher return on capital projects as an incentive to investors.<sup>58</sup>

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<sup>58</sup> S&P Global Ratings, "Assessing U.S. Investor-Owned Utility Regulatory Environments," August 10, 2016, p. 7.

1           Therefore, to the extent that Public Service's rates do not continue to permit  
2 recovery of its capital investments on a regular basis, the Company would face  
3 increased recovery risk and thus increased pressure on its credit metrics.

4 **Q.   WHAT HAVE THE CREDIT RATING AGENCIES STATED REGARDING THE**  
5 **LEVEL OF THE COMPANY'S PROJECTED CAPITAL EXPENDITURES?**

6 A.   S&P has recently characterized Xcel Energy's capital spending as "elevated," of  
7 which Public Service's renewable generation is a significant part, and noted that  
8 credit quality depends on the timeliness of the rate recovery of these expenditures:

9           **With elevated capital spending, Xcel Energy Inc.'s consolidated**  
10 **credit quality depends upon timely rate recovery and cost**  
11 **controls.** Over the next five years, Xcel plans to spend \$26 billion  
12 on utility investments, including new renewables generation, of which  
13 PSCo reflects 38%. Although it expects to offset most funding needs  
14 with future rate recovery and flat operations and maintenance  
15 spending, Xcel's credit quality ultimately depends upon the  
16 timeliness of each of these items because delayed rate recovery  
17 could increase the use of leverage, at least until recovery occurs.<sup>59</sup>

18           Similarly, Moody's has also noted that the Company's future capital  
19 expenditures remain elevated.

20           In absolute terms, the utility's capex program remains elevated  
21 compared to the around \$7.5 billion invested during the 2016-2020  
22 period. However, we note some moderation in its investments in  
23 relative terms as we calculate that on average, PSCo's annual  
24 capital outlays will represent around 2.0x (below 2.5x) the utility's  
25 depreciation expense during the 2022-2026 period (compared to a  
26 ratio of nearly 2.7x during the 2016-2020 period.<sup>60</sup>

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<sup>59</sup> S&P Global Ratings, Public Service Company of Colorado, July 26, 2022, p. 2; (bolding in original).

<sup>60</sup> Moody's Investor SERvices, Credit Opinion, Public Service Company of Colorado, December 24, 2021, at 7.



1 **C. Environmental Stewardship**

2 **Q. PLEASE BRIEFLY SUMMARIZE COLORADO'S CLEAN ENERGY GOALS?**

3 A. On May 21, 2019, the General Assembly passed Senate Bill 19-236 and House  
4 Bill 19-1261, and those bills were signed into law by Governor Polis on May 30,  
5 2019. At the same time, Governor Polis released the "Roadmap to 100%  
6 Renewable Energy by 2040 and Bold Climate Action." As required by statute, the  
7 Company is mandated to reduce its carbon emissions by 80 percent over 2005  
8 levels by 2030. SB 19-236 and the Roadmap contain additional directives and  
9 actions to meet Colorado's clean energy goals.

10 **Q. WHAT ACTIONS HAS THE COMPANY TAKEN TO ADDRESS SB 19-236 AND**  
11 **HB 19-1261?**

12 A. In March 2021, Public Service filed for approval of its 2021 Electric Resource Plan  
13 ("ERP") and Clean Energy Plan ("CEP"). After extensive litigation, multiple rounds  
14 of testimony, two settlements and two hearings, the Company and stakeholders  
15 ultimately reached an Updated Non-Unanimous Partial Settlement Agreement  
16 ("Updated Settlement Agreement"), which was approved by the Commission's  
17 Phase I decision on August 3, 2022.<sup>61</sup> The Updated Settlement Agreement  
18 positions the Company to exceed the clean energy targets set forth in the 2019  
19 legislation, produces a portfolio that meets the core tenets of reliability,  
20 sustainability and affordability, and provides for a just transition to a decarbonized  
21 future for workers and communities. The Commission issued its Phase I decision

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<sup>61</sup> Colorado Public Utilities Commission, Phase I Decision, Proceeding No. 21A-0141E, August 3, 2022.

1 on August 3, 2022,<sup>62</sup> and issued its decision on parties' applications for rehearing,  
2 reargument, or reconsideration on September 21, 2022.<sup>63</sup> Key provisions of the  
3 Updated Settlement Agreement include:<sup>64</sup>

- 4 • A reduction in carbon dioxide emissions of 85 percent by 2030 as compared  
5 to 2005 levels;
- 6 • An 80 percent renewable portfolio mix by 2030;
- 7 • Early retirement of the two-unit coal-fired Hayden facility (now 2027 and  
8 2028 versus 2030 and 2036);
- 9 • Conversion of the Pawnee coal plant to natural gas no later than January  
10 1, 2026;
- 11 • Early retirement of the Comanche Unit 3 coal plant by January 1, 2031, with  
12 reduced operations beginning in 2025; and,
- 13 • The addition of a significant level of renewable generation (approximately  
14 2,400 MW of wind; 1,600 MW of universal-scale solar; 400 MW of storage;  
15 1,300 MW of flexible, dispatchable generation; and 1,200 MW of distributed  
16 solar resources).

17 Phase II of the proceeding commenced following Phase I approval and  
18 reflects the implementation of the CEP, which is subject to a final Commission  
19 decision as to the Company's preferred cost-effective resource plan.

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<sup>62</sup> Colorado Public Utilities Commission, Phase I Decision Addressing the Application for Approval of the 2021 Electric Resource Plan and Clean Energy Plan and Approving in Part, the Updated Non-Unanimous Partial Settlement Agreement ("Phase I Decision"), Proceeding No. 21A-0141E, August 3, 2022.

<sup>63</sup> Colorado Public Utilities Commission, Commission Decision Addressing Applications for Rehearing, Reargument, or Reconsideration of Commission Decision No. C22-0459, Proceeding No. 21A-0141E, September 21, 2022.

<sup>64</sup> Public Service Company of Colorado, SEC Form 10-Q, July 28, 2022, pp. 18-19.

1 **Q. DOES THE UPDATED SETTLEMENT AGREEMENT SET THE COMPANY**  
 2 **APART IN TERMS OF ENVIRONMENTAL STEWARDSHIP RELATIVE TO THE**  
 3 **PROXY GROUP?**

4 A. Yes. As shown in Figure AEB-D-16, the Company's carbon emissions reduction  
 5 goal of 85 percent by 2030 is one of the most aggressive targets of the proxy group  
 6 companies.

7 **Figure AEB-D-16: Carbon Emission Reduction Goals of Proxy Group**

<b>Company</b>	<b>Carbon Emissions Reduction Target (%)</b>	<b>Achieve Target By (Year)</b>	<b>Comparative Emissions (Year)</b>
PSCO	85%	2030	2005
ALLETE, Inc.	80%	2035	2005
Alliant Energy Corporation	50%	2030	2005
Ameren Corporation	85%	2040	2005
American Electric Power Company, Inc.	80%	2030	2000
Avista Corporation	[1]	2027	
Black Hills Corporation [2]	70%	2040	
CMS Energy Corporation	90%	2040	2005
Duke Energy Corporation	70%	2030	
Edison International	40%	2030	1990
Entergy Corporation	50%	2030	2000
Evergy, Inc.	70%	2030	2005
IDACORP, Inc.	35%	2025	2005
NextEra Energy, Inc.	82%	2030	2005
NorthWestern Corporation	80%	2043	
OGE Energy Corporation	50%	2030	2005
Otter Tail Corporation	50%	2025	2005
Portland General Electric Company	80%	2030	Avg 2010-2012
Southern Company	50%	2030	
Wisconsin Energy Corporation	80%	2030	2005

[1] Target of carbon neutral supply of electricity.

[2] Black Hills' electric utility operations in Colorado has goal of 90% reduction from 2005 levels by 2030.

1 **Q. DOES THE UPDATED SETTLEMENT AGREEMENT INCLUDE A**  
2 **PERFORMANCE INCENTIVE MECHANISM (“PIM”) ASSOCIATED WITH THE**  
3 **COMPANY’S PERFORMANCE?**

4 A. The Updated Settlement Agreement and the Commission’s Phase I Decision  
5 (Decision No. C22-0459) in the Company’s Electric Resource Plan and Clean  
6 Energy Plan Proceeding (“2021 ERP & CEP Proceeding,” Proceeding No. 21A-  
7 0141E) provides for a stakeholder process to allow the parties to develop a  
8 proposed PIM or PIMs for emissions reductions related to the CEP and to address  
9 Comanche 3’s O&M expenses, capital costs, and availability factor. The approved  
10 stakeholder process is structured to develop a PIM or PIMs contemporaneously  
11 with Phase II of the 2021 ERP & CEP Proceeding with the Company initiating the  
12 stakeholder process 15 days after filing the 120-Day Bid Evaluation Report and  
13 filing a PIM proposal with the Commission 60 days after filing the 120-Day Bid  
14 Evaluation Report. Based on the current expected 2021 ERP & CEP Proceeding  
15 Phase II schedule, the Company anticipates initiating the stakeholder process and  
16 filing a PIM proposal(s) in the third quarter of 2023.

17 **Q. DOES THE UPDATED SETTLEMENT ADDRESS SECURITIZATION OF THE**  
18 **COMPANY’S COAL PLANTS THAT ARE TO BE RETIRED?**

19 A. The Phase I decision requires that the Company provide an analysis of  
20 securitization in Phase II of the proceeding, with that analysis to consider the cost  
21 of the Company’s generating portfolio with and without securitization.<sup>65</sup>

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<sup>65</sup> Colorado Public Utilities Commission, Phase I Decision, Proceeding No. 21A-0141E, August 3, 2022.

1 **Q. CAN SECURITIZATION AFFECT A UTILITY'S FINANCIAL PROFILE?**

2 A. Yes. While securitization is not currently implemented for one or more of the  
3 Company's generation retirements, securitization can be credit positive to a utility;  
4 however, Moody's has cautioned that too much securitization can have negative  
5 consequences. Specifically:

- 6 • Securitization can erode a utility's financial profile as the asset is removed  
7 from rate base and the utility cannot earn a return on that asset once  
8 removed.<sup>66</sup>
- 9 • The resulting increases in customers' bills may prevent regulators from  
10 approving future rate increases, affecting a utility's ability to fund future  
11 capital investment plans.<sup>67</sup> In other words, securitization financing costs  
12 passed to customers can limit the financial headroom for the utility to invest  
13 in capital investment.
- 14 • Securitization debt of utilities is considered as "on-credit" debt. When the  
15 accounting treatment is off balance sheet, Moody's will adjust the  
16 company's financial ratios by including securitization debt and related  
17 revenues in their credit assessment analysis.<sup>68</sup>

18 Therefore, it is important that there be supportive regulatory treatment if the  
19 costs associated with early retirement of generating assets are securitized in order  
20 to mitigate the potential to adversely affect the Company's financial integrity.

21 **D. Flotation Cost Risk**

22 **Q. WHAT ARE FLOTATION COSTS?**

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

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<sup>66</sup> Moody's Investors Service, Sector In-Depth, "Utility cost recovery through securitization is credit positive," July 18, 2018, p. 1.

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

1 **Q. ARE FLOTATION COSTS PART OF THE UTILITY'S INVESTED COSTS OR ITS**  
2 **EXPENSES?**

3 A. Flotation costs are part of the invested costs of the utility, which are properly  
4 reflected on the balance sheet under "paid in capital." They are not current  
5 expenses, and, therefore, are not reflected on the income statement. Rather, like  
6 investments in rate base or the issuance costs of long-term debt, flotation costs  
7 are incurred over time. As a result, the majority of a utility's flotation cost is incurred  
8 prior to the test year but remains part of the cost structure that exists during the  
9 test year and beyond. As such, these costs should be recovered through the  
10 authorized ROE. To the extent a company is denied the opportunity to recover  
11 prudently-incurred flotation costs, actual returns will fall short of expected (or  
12 required) returns, thereby diminishing a company's ability to attract adequate  
13 capital on reasonable terms.

14 **Q. IS THE NEED TO CONSIDER FLOTATION COSTS ELIMINATED BECAUSE**  
15 **PUBLIC SERVICE IS A WHOLLY-OWNED SUBSIDIARY OF XCEL ENERGY?**

16 A. No. Although Public Service is a wholly-owned subsidiary of Xcel Energy, it is  
17 appropriate to consider flotation costs in establishing the ROE for a utility for two  
18 reasons. First, a substantial portion of Public Service's paid-in equity is the result  
19 of prior public issuances of common stock made by Public Service at a time when  
20 Public Service was itself a publicly-traded entity. Second, wholly-owned  
21 subsidiaries receive equity capital from their parent and provide returns on the  
22 capital that roll up to the parent, which is designated to attract and raise capital  
23 based upon the returns of those subsidiaries. To deny recovery of issuance costs

1 associated with the capital that is invested in the subsidiaries ultimately penalizes  
2 the investors that fund the utility operations and inhibits the utility's ability to obtain  
3 new equity capital at a reasonable cost. This is particularly important for Public  
4 Service because it is planning significant capital expenditures in the near term.

5 **Q. HAS XCEL ENERGY RECENTLY ISSUED COMMON EQUITY?**

6 A. Yes, in the past year, Xcel Energy has issued approximately \$495 million of  
7 common equity (approximately 7,456,000 common shares issued) in three  
8 separate issuances in November/December 2021, May 2022 and June 2022.<sup>69</sup>

9 Flotation cost recovery is appropriate, however, regardless of whether an issuance  
10 occurs during, or is planned for, the test year because failure to allow recovery of  
11 flotation costs may deny Public Service the opportunity to earn its authorized ROE  
12 in the future.

13 **Q. IS THE NEED TO CONSIDER FLOTATION COSTS RECOGNIZED BY THE**  
14 **ACADEMIC AND FINANCIAL COMMUNITIES?**

15 A. Yes. The academic and financial communities recognize the need to reimburse  
16 investors for equity issuance costs in the same spirit that they recognize that  
17 investors should be reimbursed for the costs of issuing debt. This treatment is  
18 consistent with the philosophy of a fair rate of return. According to Dr. Shannon

19 Pratt:

20 Flotation costs occur when new issues of stock or debt are sold to  
21 the public. The firm usually incurs several kinds of flotation or  
22 transaction costs, which reduce the actual proceeds received by the  
23 firm. Some of these are direct out-of-pocket outlays, such as fees  
24 paid to underwriters, legal expenses, and prospectus preparation

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<sup>69</sup> Provided by the Company.

1 costs. Because of this reduction in proceeds, the firm's required  
2 returns on these proceeds equate to a higher return to compensate  
3 for the additional costs. Flotation costs can be accounted for either  
4 by amortizing the cost, thus reducing the cash flow to discount, or by  
5 incorporating the cost into the cost of capital. Because flotation costs  
6 are not typically applied to operating cash flow, one must incorporate  
7 them into the cost of capital.<sup>70</sup>

8 **Q. HOW DID YOU CALCULATE THE FLOTATION COSTS FOR PUBLIC**  
9 **SERVICE?**

10 A. My flotation cost calculation was based on the equity issuance costs that were  
11 incurred by Xcel Energy and its predecessors. That flotation cost percentage is  
12 then applied to the expected dividend yields for the proxy group companies. Based  
13 on the issuance costs historically incurred by the Company as shown in  
14 Attachment AEB-14, flotation costs for Public Service are approximately 0.08  
15 percent (*i.e.*, 8 basis points) for the proxy group.

16 **E. Conclusion of Regulatory and Business Risk Assessment**

17 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE REGULATORY RISK OF**  
18 **THE COMPANY'S ELECTRIC UTILITY OPERATIONS RELATIVE TO THAT OF**  
19 **THE PROXY GROUP?**

20 A. As discussed, the ratemaking conventions used to develop the Company's rates  
21 and the ability to recover capital costs in a timely manner are generally consistent  
22 with those relied upon by the majority of the utility operating subsidiaries of the  
23 proxy group companies. In addition, both S&P and Moody's have concluded that  
24 the Colorado regulatory environment is generally credit supportive. I have also

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<sup>70</sup> Shannon P. Pratt, *Cost of Capital Estimation and Applications*, Second Edition at 220-221.



1 considered the Company's elevated capital expenditure requirements relative to  
2 the proxy group, the Company's significant commitments towards decarbonization  
3 relative to the proxy group, and the flotation costs that have been incurred by the  
4 Company. While I am not recommending an explicit adjustment for the regulatory  
5 and business risks to the authorized ROE in this proceeding, I have considered  
6 these factors in determining where my recommended ROE for the Company  
7 should be within the range of reasonable results. I have also considered that, while  
8 Public Service has certain ratemaking and cost recovery mechanisms that are  
9 generally credit supportive, the Company persistently been unable to earn its  
10 authorized ROE. Therefore, in my view, based on all of these factors, Public  
11 Service has somewhat higher regulatory and business risk than the proxy group,  
12 which supports an authorized ROE above the median of the range of results  
13 produced by the cost of equity models.

1 **IX. CAPITAL STRUCTURE**

2 **Q. IS THE CAPITAL STRUCTURE OF THE COMPANY AN IMPORTANT**  
3 **CONSIDERATION IN THE DETERMINATION OF THE APPROPRIATE ROE?**

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

12 **Q. WHAT IS PUBLIC SERVICE'S PROPOSED CAPITAL STRUCTURE?**

13 A. As discussed in the Direct Testimony of Company witness Mr. Paul A. Johnson,  
14 Public Service is proposing a capital structure that is composed of 42.37 percent  
15 long-term debt, 1.93 percent short-term debt and 55.70 percent equity.

16 **Q. HAVE YOU ANALYZED THE CAPITAL STRUCTURES OF THE PROXY GROUP**  
17 **COMPANIES?**

18 A. Yes. I calculated the percentages of common equity, long-term debt and short-  
19 term debt over the most recent two years for each of the utility operating  
20 subsidiaries of the proxy group companies. Because the cost of equity is  
21 established based on the return that is derived from the risk-comparable proxy  
22 group, it is reasonable to look to the proxy group average capital structure to  
23 benchmark the equity ratio for the Company. As shown in Attachment AEB-15,

1 the equity ratios for the utility operating subsidiaries of the proxy group range from  
2 44.95 percent to 63.58 percent, with a median of 52.78 percent. Public Service's  
3 proposed equity ratio of 55.70 percent is within the range of equity ratios of the  
4 proxy group. Accordingly, I consider the proposed equity ratios to be reasonable.

5 **Q. ARE THERE OTHER FACTORS TO BE CONSIDERED IN SETTING THE**  
6 **COMPANY'S CAPITAL STRUCTURE?**

7 A. The credit rating agencies' response to the Tax Cuts and Jobs Act of 2017 ("TCJA")  
8 must also be considered when determining the equity ratio. While I recognize that  
9 the TCJA was enacted in 2017, the cash flows for utilities were altered  
10 permanently, as noted by all three rating agencies at the time that the legislation  
11 was enacted. S&P and Fitch specifically identified increasing the equity ratio as  
12 one approach to ensure that utilities have sufficient cash flows following the federal  
13 income tax rate reductions and the loss of bonus depreciation. As S&P noted,  
14 "[r]egulators must also recognize that tax reform is a strain on utility credit quality,  
15 and we expect companies to request stronger capital structures and other means  
16 to offset some of the negative impact."<sup>71</sup> Furthermore, Moody's downgraded the  
17 rating outlook for the entire utilities sector in June 2018 and has continued to  
18 downgrade the ratings of utilities based in part on the negative effects of the TCJA  
19 on cash flows.

20 Most recently, Moody's revised its 2023 outlook for the utilities sector to  
21 "negative" based on ongoing challenges of inflation, increasing interest rates and

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<sup>71</sup> Standard & Poor's Ratings, "U.S. Tax Reform: For Utilities' Credit Quality, Challenges Abound",  
January 24, 2018, at 5.

1 higher natural gas prices. Moody's noted that these challenges increase the  
2 pressure on customer affordability and the ability of utilities to promptly recover  
3 their costs. Moody's concluded that regulated utilities' financial metrics are already  
4 under pressure with little cushion, and that sustained capital spending is likely as  
5 utilities continue progress towards emissions reductions and net-zero goals.  
6 Moody's noted that the outlook could return to stable if regulatory support remains  
7 intact.<sup>72</sup>

8 S&P also continues to maintain a negative outlook for the utility industry in  
9 2022<sup>73</sup> and noted that since downgrades outpaced upgrades for a second  
10 consecutive year in 2021, for the first time ever the median investor-owned utility  
11 credit rating fell to the "BBB" category.<sup>74</sup> Further, S&P expects continued pressure  
12 on cash flows over the near-term as utilities continue to increase leverage to fund  
13 capital expenditure plans necessary to reduce greenhouse gas emission and  
14 improve safety and reliability. Finally, S&P also highlighted inflation, higher interest  
15 rates and rising commodity prices as additional risks that could further constrain  
16 the credit metrics for utilities over the near-term. In regards to inflation, S&P noted:

17 Inflation recently spiked to its highest level in decades after rising for  
18 several consecutive months in 2021. Given the sustained increase  
19 to the U.S. consumer price index in 2021, inflation no longer appears  
20 to be just transitory and may have financial implications for the  
21 investor-owned North American regulated utility industry. Because  
22 of the regulatory lag within the industry, inflation, which causes prices

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<sup>72</sup> See, e.g., Walton, Robert, "Moody's adopts negative outlook for regulated utility sector, warns on gas prices, economy and cost recovery," Utility Dive, November 11, 2022; Bennett, Abbie, "Moody's revises US regulated utilities outlook to negative," S&P Capital IQ Pro, November 11, 2022.

<sup>73</sup> S&P Global Ratings, "Regulated Utilities: Credit quality has weakened and credit risks are rising," July 14, 2022.

<sup>74</sup> S&P Global Ratings, "For The First Time Ever, The Median Investor-Owned Utility Ratings Falls To The 'BBB' Category," January 20, 2022.

1 to rise, typically leads to a weakening of financial performance. The  
2 regulatory lag is the timing difference between when costs are  
3 incurred and when regulators allow those costs to be fully recovered  
4 from ratepayers.<sup>75</sup>

5 The credit ratings agencies' continued concerns over inflation and  
6 increased capital expenditures underscore the importance of maintaining  
7 adequate cash flow metrics for the industry, as a whole, and Public Service,  
8 particularly, in the context of this proceeding.

9 **Q. WILL THE CAPITAL STRUCTURE AND ROE AUTHORIZED IN THIS**  
10 **PROCEEDING AFFECT THE COMPANY'S ACCESS TO CAPITAL AT**  
11 **REASONABLE RATES?**

12 A. Yes. The level of earnings authorized by the Commission directly affects the  
13 Company's ability to fund its operations with internally generated funds. Both bond  
14 investors and rating agencies expect a significant portion of ongoing capital  
15 investments to be financed with internally-generated funds. In addition, it is  
16 important to recognize that because a utility's investment horizon is very long,  
17 investors require the assurance of a sufficiently high return to satisfy the long-run  
18 financing requirements of the assets placed into service. Those assurances, which  
19 often are measured by the relationship between internally generated cash flows  
20 and debt (or interest expense), depend quite heavily on the capital structure. As  
21 a consequence, both the ROE and capital structure are very important to debt and  
22 equity investors. Furthermore, considering the current and expected capital

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<sup>75</sup> *Id.*

1 market conditions during which the Company's rates will be in effect, the  
2 authorized ROE and capital structure take on even greater significance.

3 **Q. WHAT IS YOUR CONCLUSION REGARDING PUBLIC SERVICE'S PROPOSED**  
4 **CAPITAL STRUCTURE?**

5 A. Considering the actual capital structures of the proxy group operating companies,  
6 I believe that Public Service's proposed common equity ratio of 55.70 percent is  
7 reasonable. The proposed equity ratio is well within the range of equity ratios  
8 established by the capital structures of the utility operating subsidiaries of the proxy  
9 companies.

1                                   **X. CONCLUSIONS AND RECOMMENDATION**

2   **Q.    WHAT IS YOUR CONCLUSION REGARDING A FAIR ROE FOR PUBLIC**  
3   **SERVICE?**

4   **A.**    Figure AEB-D- 17 provides a summary of my analytical results for the proxy group.  
5            Based on these results, the business and financial risks of the Company compared  
6            to the proxy group, and the current and projected capital market conditions,  
7            including the expectation for rising interest rates to combat inflationary pressure, it  
8            is my view that an ROE of 10.25 percent is reasonable and would fairly balance  
9            the interests of customers and shareholders. This ROE would enable the  
10           Company to maintain its financial integrity and therefore its ability to attract capital  
11           at reasonable rates under a variety of economic and financial market conditions,  
12           while continuing to provide safe, reliable, and affordable electric utility service to  
13           customers and achieve its aggressive decarbonization initiatives.

14                    Public Service's requested capital structure composed of 42.37 percent  
15            long-term debt, 1.93 percent short-term debt and 55.70 percent equity is well within  
16            the range established by the proxy group. As such, I believe the requested capital  
17            structure is reasonable.

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**Figure AEB-D- 17: Summary of Results**

<b><i>Constant Growth DCF</i></b>			
	Minimum Gwth Rate	Average Gwth Rate	Maximum Gwth Rate
Mean Results:			
30-Day Average	8.43%	9.66%	11.03%
90-Day Average	8.16%	9.39%	10.76%
180-Day Average	8.14%	9.36%	10.73%
Average	8.25%	9.47%	10.84%
Median Results:			
30-Day Average	8.10%	9.38%	10.43%
90-Day Average	7.81%	9.19%	10.02%
180-Day Average	7.88%	9.33%	9.95%
Average	7.93%	9.30%	10.14%
<b><i>Multi-Stage DCF</i></b>			
	Minimum Gwth Rate	Average Gwth Rate	Maximum Gwth Rate
Mean Results:			
30-Day Average	9.40%	9.73%	10.16%
90-Day Average	9.11%	9.42%	9.83%
180-Day Average	9.09%	9.40%	9.80%
Average	9.20%	9.51%	9.93%
Median Results:			
30-Day Average	9.40%	9.61%	9.81%
90-Day Average	9.14%	9.32%	9.39%
180-Day Average	9.12%	9.31%	9.36%
Average	9.22%	9.41%	9.52%



<b>CAPM / ECAPM</b>			
	Current 30-Day Avg 30-Year Treasury Yield	Near-Term Forecast 30-Year Treasury Yield	Longer-Term Forecast 30-Year Treasury Yield
<b>CAPM:</b>			
Value Line Beta	11.71%	11.72%	11.70%
Bloomberg Beta	11.17%	11.18%	11.14%
Long-term Avg. Beta	10.54%	10.56%	10.51%
<b>ECAPM:</b>			
Value Line Beta	11.97%	11.98%	11.96%
Bloomberg Beta	11.56%	11.58%	11.55%
Long-term Avg. Beta	11.09%	11.11%	11.07%
<b>Risk Premium</b>			
	Current 30-Day Avg 30-Year Treasury Yield	Near-Term Forecast 30-Year Treasury Yield	Longer-Term Forecast 30-Year Treasury Yield
Results	10.33%	10.36%	10.27%

1 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

2 A. Yes.

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

\* \* \* \*

IN THE MATTER OF ADVICE LETTER )  
NO. 1906-ELECTRIC OF PUBLIC )  
SERVICE COMPANY OF COLORADO )  
TO REVISE ITS COLORADO PUC NO. )  
8-ELECTRIC TARIFF TO REVISE )  
JURISDICTIONAL BASE RATE ) PROCEEDING NO. 22AL-\_\_\_\_E  
REVENUES, IMPLEMENT NEW BASE )  
RATES FOR ALL ELECTRIC RATE )  
SCHEDULES, AND MAKE OTHER )  
TARIFF PROPOSALS EFFECTIVE )  
DECEMBER 31, 2022. )

AFFIDAVIT OF ANN E. BULKLEY  
ON BEHALF OF  
PUBLIC SERVICE COMPANY OF COLORADO

I, Ann E. Bulkley, being duly sworn, state that the Direct Testimony and attachments were prepared by me or under my supervision, control, and direction; that the Direct Testimony and attachments are true and correct to the best of my information, knowledge and belief; and that I would give the same testimony orally and would present the same attachments if asked under oath.

Dated at Boston, Massachusetts, this 21<sup>ST</sup> day of November, 2022.

*Ann E. Bulkley*

Ann E. Bulkley  
Principal

Subscribed and sworn to before me this 21<sup>ST</sup> day of Nov., 2022.

*Gerard M. Rooney*

Notary Public

My Commission expires

6/30/2028



Gerard M. Rooney  
NOTARY PUBLIC  
Commonwealth of  
Massachusetts  
My Commission Expires  
6/30/2028