TUCSON ELECTRIC POWER COMPANY
System Reliability Benefits
Rate Schedule 2: SRB Balancing Account, Year Over Year Cap, Annual Adjustment and Rate Calculations
As of Month, Day, Year

Line No.			
	SRB Balancing Account		
1.	SRB Adjustment Prior Year	$	-
2.	SRB Revenue Billed Prior Year	$	-
3.	SRB Balancing Account (Line 1 - Line 2)	$	-
	SRB Year Over Year Cap		
4.	Total Retail Revenue Requirement Approved in Decision XXXXX	$	-
5.	Annual Year Over Year Cap Percentage		3%
6.	Annual Year Over Year Cap Amount (Line 4 x Line 5)	$	-
7.	Prior Year Cap Amount (Prior Year Line 8)	$	-
8.	Current Year Cap Amount (Line 6 + Line 7)	$	-
	SRB Earnings Test Cap		
9.	Earnings Test Revenue Cap	$	-
	Annual SRB Adjustment		
10.	Current Year Annual SRB Capital Carrying Costs (Schedule 1, Line 10)	$	0
11.	SRB Balancing Account (Line 3)	$	-
12.	SRB Deferred Amounts (Prior Year Line 15)	$	-
13.	Total Annual SRB Adjustment Before Cap (Sum of Lines 10 - 12)	$	0
14.	Total Annual SRB Adjustment After Cap (Lessor of Line 8, Line 9, or Line 13)	$	-
15.	Annual SRB Adjustment Deferred	$	0
	SRB Rate		
16.	Total Company Retail Sales (kWh)		0
17.	Calculated SRB Rate ($/kWh) (Line 14 / Line 16)	$	-

TUCSON ELECTRIC POWER COMPANY
System Reliability Benefits
Rate Schedule 3: Estimated Residential Bill Impact
As of Month, Day, Year

	kWh	Billing Months
Summer kWh	0	0
Winter kWh	0	0
Monthly Weighted Average		0

Summer	Current Rates	Proposed Rates
Customer Charge (Single Phase)	$0.00	$0.00
Energy Charges		
First 500 kWh	$0.000000	$0.000000
501-1,000 kWh	$0.000000	$0.000000
1,001-3,500 kWh	$0.000000	$0.000000
>3,500	$0.000000	$0.000000
Power Supply Charges		
Base Power	$0.000000	$0.000000
PPFAC	$0.000000	$0.000000
SRB Charges		
SRB Charges	$0.000000	$0.000000

Winter	Current Rates	Proposed Rates
Customer Charge (Single Phase)	$0.00	$0.00
Energy Charges		
First 500 kWh	$0.000000	$0.000000
501-1,000 kWh	$0.000000	$0.000000
1,001-3,500 kWh	$0.000000	$0.000000
>3,500	$0.000000	$0.000000
Fuel Charges		
Base Power	$0.000000	$0.000000
PPFAC	$0.000000	$0.000000
SRB Charges		
SRB	$0.000000	$0.000000

Summer	Current	Proposed	$ Difference	% Difference
	$0.00	$0.00	$0.00	0.00%
Blocks				
0	$0.00	$0.00	$0.00	0.00%
0	$0.00	$0.00	$0.00	0.00%
0	$0.00	$0.00	$0.00	0.00%
0	$0.00	$0.00	$0.00	0.00%
	$0.00	$0.00	$0.00	0.00%
	$0.00	$0.00	$0.00	0.00%
Subtotal	$0.00	$0.00	$0.00	0.00%
	$0.00	$0.00	$0.00	0.00%
Total Summer Bill	$0.00	$0.00	$0.00	0.00%

Winter	Current	Proposed	$ Difference	% Difference
	$0.00	$0.00	$0.00	0.00%
Blocks				
0	$0.00	$0.00	$0.00	0.00%
0	$0.00	$0.00	$0.00	0.00%
0	$0.00	$0.00	$0.00	0.00%
0	$0.00	$0.00	$0.00	0.00%
	$0.00	$0.00	$0.00	0.00%
	$0.00	$0.00	$0.00	0.00%
Subtotal	$0.00	$0.00	$0.00	0.00%
	$0.00	$0.00	$0.00	0.00%
Total Winter Bill	$0.00	$0.00	$0.00	0.00%
Total Annual	$0.00	$0.00	$0.00	0.00%
Avg. Monthly Bill	$0.00	$0.00	$0.00	0.00%

TUCSON ELECTRIC POWER COMPANY
System Reliability Benefits
Rate Schedule 4: Earnings Test
As of Month, Day, Year

Line No.			
1.	Adjusted Original Cost Rate Base ("OCRB") as of December 31, XXXX	$	-
2.	Authorized Rate of Return from Decision No. XXXXX		0.00%
3.	Required Operating Income on Adjusted OCRB (Line 1 x Line 2)	$	-
4.	Return on FVI from Decision No. XXXXX	$	-
5.	Total Required Operating Income (Line 3 + Line 4)	$	-
6.	Adjusted Operating Income for the Year Ended December 31, XXXX	$	-
7.	Operating Income Deficiency (Line 5 - 6)	$	-
8.	Gross Revenue Conversion Factor		0.0000
9.	Earnings Test Revenue Cap (Line 7 x 8)	$	-

Attach supporting calculations for all amounts entered into this schedule.

Anna Tovar
COMMISSIONER

(602) 542-3935 OFFICE
Tovar-Web@azcc.gov

ARIZONA CORPORATION COMMISSION
OFFICE OF COMMISSIONER ANNA TOVAR

August 25, 2023

Docket Control
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

Re: In the Matter of the Application of Tucson Electric Power Company for the Establishment of Just and Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of the Properties of Tucson Electric Power Company Devoted to its Operations Throughout the State of Arizona and for Related Approvals (E-01933A-22-0107).

Dear Commissioners, Parties, and Stakeholders,

I could not support this Decision because I think the overall result takes us backwards. In my opinion, the Commission adopted too high of a return on equity and included too much in the Purchase Power Fuel Adjustor Clause ("PPFAC"). In addition, the Commission stripped some important measures from the Recommended Opinion and Order that helped customers and coal impacted communities.

I was happy to see the rate design proposed by Staff and the Company was adopted by the Commission, however, I believe it should have been paired with a 9.27% return on equity, rather than the 9.55% adopted by the Commission. In addition, I believe we should have taken the opportunity to address the PPFAC. We have been discussing reforming the PPFAC for months. We had that opportunity in this rate case. I believe we should have removed several components, chief among them chemicals, to bring the fuel adjustor back to its original intent. In the alternative, we should have adopted the Administrative Law Judge's recommendation for a Phase 2 proceeding. Instead, the Commission just reaffirmed the existing methodology.

Finally, a series of amendments systematically stripped the Decision of several common-sense solutions for customers and instead, added additional burdens on ratepayers. I opposed amendments eliminating electric vehicle price signals that push charging to times when it is best for the grid. I opposed cutting an energy efficiency pilot program designed to help customers better control their bills. I opposed payment processing fees that would disproportionally fall on low-income customers. And, I opposed closing a Phase 2 proceeding for coal community transition.

As a result, I regrettably must dissent.

Sincerely,

Anna Tovar

Anna Tovar
Commissioner

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
LEA MARQUEZ PETERSON - CHAIR
SANDRA D. KENNEDY
JUSTIN OLSON
ANNA TOVAR
JIM O'CONNOR

IN THE MATTER OF THE APPLICATION OF UNS ELECTRIC, INC FOR THE ESTABLISHMENT OF JUST AND REASONABLE RATES AND CHARGES DESIGNED TO REALIZE A REASONABLE RATE OF RETURN ON THE FAIR VALUE OF THE PROPERTIES OF UNS ELECTRIC, INC. DEVOTED TO ITS OPERATIONS THROUGHOUT THE STATE OF ARIZONA, AND FOR RELATED APPROVALS	)	DOCKET NO. E-04204A-22-0251

Direct Testimony of

Ann E. Bulkley

On Behalf of

UNS Electric, Inc.

November 18, 2022

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AEB-2	Proxy Group Selection
AEB-3	Constant Growth DCF Model
AEB-4	Capital Asset Pricing Model / Empirical Capital Asset Pricing Model
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Attachment A	Resume and Testimony Listing of Ann E. Bulkley

I. INTRODUCTION AND QUALIFICATIONS

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

A. My name is Ann E. Bulkley. I am a Principal with The Brattle Group ("Brattle"), located at One Beacon Street, Boston, Massachusetts, 02108.

Q. On whose behalf are you submitting this Direct Testimony?

A. I am submitting this Direct Testimony before the Arizona Corporation Commission (the "ACC" or "Commission") on behalf of UNS Electric, Inc. ("UNS Electric" or the "Company"). UNS Electric is a wholly-owned subsidiary of UNS Energy Corporation ("UNS Energy"). UNS Energy was purchased in August 2014 by Fortis, Inc. ("Fortis"). Fortis is an investor-owned utility holding company based in St. John's Newfoundland and Labrador, Canada.

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

A. I hold a Bachelor's degree in Economics and Finance from Simmons College and a Master's degree in Economics from Boston University, with more than 30 years of experience consulting to the energy industry. I have advised numerous energy and utility clients on a wide range of financial and economic issues with primary concentrations in valuation and utility rate matters. Many of these assignments have included the determination of the cost of capital for valuation and ratemaking purposes. I have included my resume and a summary of testimony that I have filed in other proceedings as Attachment A.

II. PURPOSE AND OVERVIEW OF DIRECT TESTIMONY

Q. What is the purpose of your Direct Testimony?

A. The purpose of my Direct Testimony is to present evidence and provide a recommendation regarding the appropriate Return on Equity ("ROE") for the Company and to provide an assessment of the capital structure to be used for ratemaking purposes as proposed in the Direct Testimony of Company Witness Martha B. Pritz. My Direct Testimony also provides evidence and a recommendation as to the appropriate Fair Value Rate of Return ("FVROR") and to the reasonableness of the Company's proposed Fair Value Rate Base ("FVRB"). My analyses and recommendations are supported by the data presented in Exhibit AEB-1 through Exhibit AEB-15, which were prepared by me or under my supervision.

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

A. As discussed in more detail in Section VII, I applied several cost of equity ("COE") models including the Constant Growth form of the Discounted Cash Flow ("DCF") model, the Capital Asset Pricing Model ("CAPM"), the Empirical Capital Asset Pricing Model ("ECAPM"), and the Bond Yield Plus Risk Premium analysis. My recommendation also takes into consideration: (1) the Company's capital expenditure requirements; and (2) the regulatory environment in which the Company operates. While I did not make any specific adjustments to my COE estimates for any of these factors, I did consider these factors in aggregate when determining where the Company's ROE falls within the range of analytical

results. Finally, I considered the Company's projected capital structure as compared to the capital structures of the proxy companies.[1]

Q. What are your conclusions regarding the appropriate cost of equity and FVROR for UNS Electric?

A. As discussed in the remainder of my Direct Testimony, I believe that a reasonable ROE for UNS Electric is 10.25 percent. I also believe that the Company's requested return on the Fair Value Increment of 0.69 percent is conservative. The resulting FVROR is 5.34 percent.

Q. How is the remainder of your Direct Testimony organized?

A. Section III provides a summary of my analyses and conclusions. Section IV reviews the regulatory guidelines pertinent to the development of the cost of capital. Section V discusses current and projected capital market conditions and the effect of those conditions on UNS Electric's cost of equity. Section VI explains my selection of a proxy group of electric utilities. Section VII describes my analyses and the analytical basis for the recommendation of the appropriate ROE for UNS Electric. Section VIII provides a discussion of specific regulatory, business, and financial risks that have a direct bearing on the ROE to be authorized for the Company in this case. Section IX addresses the Company's capital structure. Section X presents my conclusions and recommendations for

[1] The selection and purpose of developing a group of comparable companies will be discussed in detail in Section VI of my Direct Testimony.

the market cost of equity. Section XI discusses my analysis of the Company's proposed FVRB. Section XII discuss the estimation of the FVROR.

III. SUMMARY OF ANALYSIS AND CONCLUSIONS

Q. Please summarize the key factors considered in your analyses and upon which you base your recommended ROE.

A. In developing my recommended ROE for UNS Electric, I considered the following:

- The *Hope* and *Bluefield* decisions[2] that established the standards for determining a fair and reasonable allowed ROE, including consistency of the allowed return with the returns of other businesses having similar risk, adequacy of the return to provide access to capital and support credit quality, and the requirement that the result lead to just and reasonable rates.

- The effect of current and projected capital market conditions on investors' return requirements.

- The results of several analytical approaches that provide estimates of the Company's COE. Because the Company's ROE should estimate the forward-looking cost of equity, these analyses rely on forward-looking inputs and assumptions (e.g., projected analyst growth rates in the DCF model, forecasted risk-free rate and Market Risk Premium in the CAPM analysis, etc.).

- The Company's regulatory, business, and financial risks relative to the proxy group of comparable companies, and the implications of those risks in determining an appropriate ROE for the Company over the period during which rates will be in effect.

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

Q. Please explain how you considered those factors.

A. After considering these factors and the results of my analyses, I relied on the range of results produced by the Constant Growth DCF model, the CAPM and ECAPM, and a Risk Premium analysis. The COE estimation models produce a wide range of results. My conclusion as to where, within that range of results, UNS Electric's cost of equity falls is based on my assessment of market conditions, and the Company's business and financial risk relative to the proxy group. Although the companies in my proxy group are generally comparable to UNS Electric, each company is unique, and no two companies have the exact same business and financial risk profiles. Accordingly, I considered the Company's business and financial risk in the aggregate in comparison to that of the proxy group companies when determining where the Company's ROE falls within the reasonable range of analytical results to account for any residual differences in risk.

Q. Please summarize the results of the COE estimation models that you considered to establish the range of ROEs for UNS Electric.

A. As shown in Exhibits AEB-3 through 7, the range of results using the Constant Growth DCF, CAPM, ECAPM and Bond Yield Risk Premium analysis is from 8.13 percent to 11.94 percent.

The range of results produced by the ROE estimation models is wide. While it is common to consider multiple models to estimate the cost of equity, it is particularly important when the range of results varies considerably across methodologies. As a result, my ROE recommendation considers the range of results of the Constant Growth DCF model, as well

as the results of the CAPM, ECAPM, and Bond Yield Plus Risk Premium analyses. My ROE recommendation also considers UNS Electric's company-specific risk factors and current and prospective capital market conditions.

Q. Please summarize your conclusions.

A. In determining the appropriate ROE and capital structure for a company it is important to consider more than the results of the traditional COE estimation models. As is discussed in more detail in my Direct Testimony, it is important to consider the overall market conditions and how those conditions affect the assumptions of the COE estimation models. In addition, it is necessary to consider the relative risk of the company, in this case, UNS Electric, as compared with the proxy group. The analyses presented in my testimony support the following conclusions:

- Inflation is expected to persist over the near-term which increases the operating risk of the utility. Additionally, long-term interest rates are expected to increase over the near-term in response to inflation. Utility share prices are inversely related to changes in interest rates. As interest rates rise, it is likely that utility share prices will decline. Therefore, the DCF model which relies on current utility share prices is likely understating the cost of equity during the period that UNS Electric's rates will be in effect. This change in market conditions also supports the use of other COE estimation models such as the CAPM and ECAPM which may be specified using forward looking inputs and thus better reflect expect market conditions.

- Equity analysts have also noted the increased risk for the utility sector as a result of rising interest rates and therefore expect the sector to underperform over the near-term.

- UNS Electric faces greater business and financial risk relative to the proxy group due to the regulatory environment in Arizona and the Company's significant capital investments plan.

- As shown in Exhibit AEB-9, comparing UNS Electric's risk to the proxy group companies demonstrates that UNS Electric's current adjustment mechanisms are similar to or slightly less risk-mitigating than those approved for the proxy group

companies. In the event that any of UNS Electric's mechanisms were to be eliminated or substantially changed to reduce recovery, or new mechanisms not approved, UNS Electric's risk would be increased, as compared with the proxy group.

It is reasonable and appropriate to consider all of these factors when estimating, within the model results, the range and investor-required return on equity for UNS Electric. Comparing UNS Electric to the proxy group, it is evident that UNS Electric has a higher overall risk profile than the proxy group, related to the differences in the specific operating risk factors identified in my testimony. Reviewing the analysis summarized above, the Company's requested return of 10.25 percent is reasonable when considering the overall market conditions and the company-specific risks faced by UNS Electric.

Q. Please summarize your analysis of the appropriate ratemaking capital structure for the Company.

A. Based on the analysis presented in Section IX of my testimony, I conclude that UNS Electric's proposed 53.72 percent common equity is reasonable. To determine if UNS Electric's requested capital structure was reasonable, I reviewed the capital structures of the utility subsidiaries of the proxy companies. As shown in Exhibit AEB-13, the results of that analysis demonstrate that the equity ratios for the utility operating companies of the proxy group range from 46.21 percent to 60.72 percent, with an average of 52.96 percent. Comparing the recommended equity ratio to the proxy group demonstrates that the Company's requested equity ratio is well within the range equity ratios for the utility operating subsidiaries of the proxy group companies. Further, the Company's proposed equity ratio is reasonable considering the negative effect of the Tax Cuts and Jobs Act of

2017 ("TCJA") and increased capital expenditures on the cash flows and UNS Electric's credit metrics, all of which have been discussed in Moody's April 2022 credit opinion when concluding that UNS Electric had "little cushion above downgrade threshold".[3]

Q. How did you estimate the FVROR?

A. I estimated the FVROR using the approach relied on by the Commission in several recent rate cases. In applying that method, I also conclude that the minimum rate of return that should be applied to the fair value "increment" of rate base is the real risk-free rate of return, which I estimate to be 1.38 percent. Notwithstanding the market expectation that the risk-free rate should represent the floor on investments that are not risk-free, the Company has conservatively proposed the use of one half of the real risk-free rate as the return on the FVI or 0.69 percent. As shown in Figure 1 and Figure 2, the result of that analysis is a FVROR of 5.34 percent.

Figure 1: Estimation of the FVRB

Capital	$ Millions	Percent	Weighted FVRB
OCRB	$399.50	50.00%	$199.8
RCND	$760.72	50.00%	$380.4
FVRB			$580.1

Figure 2: Estimation of the FVROR

Capital	$ Millions	Percent	Cost Rate	Weighted Cost Rate
Long-Term Debt	$184.890	31.87%	4.19%	1.34%
Common Equity	$214.613	36.99%	10.25%	3.79%
Fair Value Increment	$180.611	31.13%	0.69%	0.22%
Total	$580.113			5.34%

[3] Moody's Investor Services, Credit Opinion, UNS Electric, Inc., April 12, 2022 at 4.

As discussed in more detail in Section XII of my Direct Testimony, reviewing the Commission's recent determination to offset the return on the FVI demonstrates that the Commission's methodology had the effect of reducing the overall FVROR in the Company's last rate proceeding, which is inconsistent with historical precedent and my understanding of the Arizona constitutional requirement to consider a return on the FVI.

IV. REGULATORY GUIDELINES

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

A. The United States Supreme Court's precedent-setting *Hope* and *Bluefield* cases established the standards for determining the reasonableness of a utility's allowed ROE. Among the standards established by the Court in those cases are: (1) consistency with the returns on equity investments in other businesses having similar or comparable risks; (2) adequacy of the return to support credit quality and access to capital; and (3) an understanding that the means of arriving at a fair return are not controlling, only that the end result leads to just and reasonable rates.

Q. Is fixing a fair rate of return just about protecting the utility's interests?

A. No. As the court noted in *Bluefield*, a proper rate of return not only assures "confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit [but also] enable[s the utility] to raise the money necessary for the proper discharge of its public duties." *Bluefield,* 262

US at 693. As the Court went on to explain in *Hope*, "[t]the rate-making process … involves balancing of the investor and consumer interests." *Hope* 320 US at 603.

Q. Has the Commission provided similar guidance in establishing the appropriate return on common equity?

A. Yes, it has. The Commission has noted that under the Arizona Constitution, a public utility is entitled to a fair return on the fair value of its property devoted to public uses. The Commission is required to find the fair value of the utility's property and to use that value to establish just and reasonable rates.[4]

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

A. An ROE that is adequate to attract capital at reasonable terms enables the Company to continue to provide safe, reliable electric service while maintaining its financial integrity. To the extent the Company is provided the opportunity to earn its market-based cost of capital, neither customers nor shareholders are disadvantaged.

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

A. Yes. Utilities compete directly for capital with other investments of similar risk, which include other natural gas and electric utilities. Therefore, the ROE awarded to a utility

[4] See, e.g., *Arizona Corp. Comm'n v. Ariz. Water Co.*, 85 Ariz. 198, 203, 335 P.2d 412, 415 (1959).

sends an important signal to investors regarding whether there is regulatory support for financial integrity, dividends, growth, and fair compensation for business and financial risk. The cost of capital represents an opportunity cost to investors. If higher returns are available for other investments of comparable risk, investors have an incentive to direct their capital to those investments. Thus, an authorized ROE that is not in line with authorized ROEs for other natural gas and electric utilities, taking into consideration differences in risk and market conditions, can inhibit the utility's ability to attract capital for investment in Arizona.

Q. What are your conclusions regarding regulatory guidelines?

A. The ratemaking process is premised on the principle that a utility must have the opportunity to recover the return of, and the market-required return on, its invested capital. Because utility operations are capital-intensive, regulatory decisions should enable the utility to attract capital at reasonable terms under a variety of economic and financial market conditions; doing so balances the long-term interests of the utility and its customers.

The financial community carefully monitors the current and expected financial condition of utility companies and the regulatory framework in which they operate. In that respect, the regulatory framework is one of the most important factors in both debt and equity investors' assessments of risk. The Commission's order in this proceeding, therefore, should establish rates that provide the Company with the opportunity to earn an ROE that is: (1) adequate to attract capital at reasonable terms under a variety of economic and

financial market conditions; (2) sufficient to ensure the utility's financial integrity; and (3) commensurate with returns on investments in enterprises with similar risk. To the extent UNS Electric is authorized the opportunity to earn its market-based cost of capital, the proper balance is achieved between customers' and shareholders' interests.

V. CAPITAL MARKET CONDITIONS

Q. Why is it important to consider capital market conditions in the estimation of the investor-required return on equity?

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

As is discussed in the remainder of this section, analysts and regulatory commissions have concluded that current market conditions have affected the results of the COE estimation models. As a result, it is important to consider the effect of these conditions on the COE estimation models when determining the appropriate range and recommended ROE for a future period. If investors do not expect current market conditions to be sustained in the future, it is possible that the COE estimation models will not provide an accurate estimate

of investors' required return during that rate period. Therefore, it is important to consider projected market data to estimate the return for that forward-looking period.

Q. What factors are affecting the cost of equity for regulated utilities in the current and projected capital markets?

A. The cost of equity for regulated utility companies is being affected by several factors in the current and prospective capital markets, including: 1) changes in monetary policy, 2) currently high inflation continuing well into 2022, 3) increasing interest rates, and 4) volatile market conditions. These factors affect the assumptions used in the ROE estimation models. In this section, I discuss each of these factors and how it affects the models used to estimate the cost of equity for regulated utilities.

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

A. As is discussed in more detail in the remainder of this section, the combination of persistently high inflation, the Federal Reserve's changes in monetary policy, and the dramatic shifts in market conditions resulting from political influences all contribute to an expectation of increased market risk and an increase in the cost of the investor-required return on equity. It is essential that these factors be considered in setting a forward-looking cost of equity. Inflation is currently at its highest level seen in approximately 40 years. Interest rates, which have increased significantly from pandemic-related lows seen in 2020, are expected to continue to increase in direct response to the Federal Reserve's use of

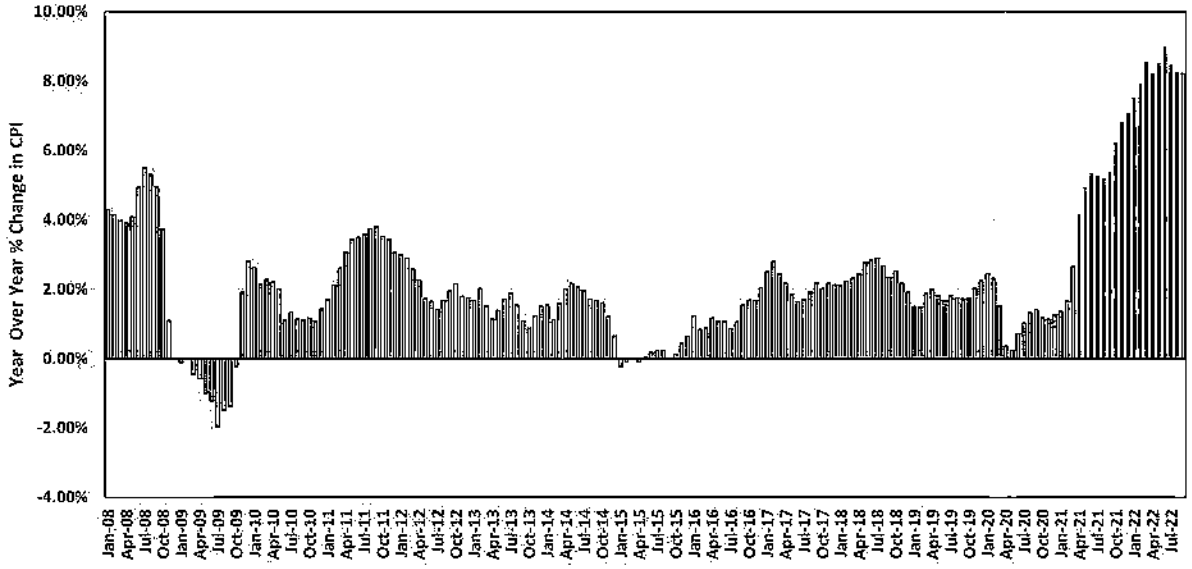
monetary policy. As discussed later herein, since there is a strong historical inverse correlation between interest rates and the share prices of utility stocks, it is reasonable to expect that investors' cost of equity is increasing. Because the cost of equity in this proceeding is being estimated for the period that the Company's rates will be in effect and because the cost of equity is expected to increase over the near-term for utilities, ROE estimates based in whole or in part on current or recent market conditions will understate the ROE during the future period that the Company's rates will be in effect.

A. Inflationary Expectations in Current and Project Capital Market Conditions

Q. Has inflation increased significantly over the past year?

A. Yes. As shown in Figure 3, the year-over-year ("YOY") change in the Consumer Price Index ("CPI") published by the Bureau of Labor statistics has increased steadily since the beginning of 2021, rising from 1.37 percent in January 2021. Since that time, and particularly since the start of 2022, inflation has increased steadily, reaching a high of 9.0 percent YOY change in June 2022, which was the largest 12-month increase since 1981 and significantly greater than any level seen since January 2008, in September, CPI decreased to 8.22 percent, which is still at levels not seen since the 1980s.

Figure 3: Consumer Price Index—YOY Percent Change January 2008–September 2022[5]



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

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

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

[5] Source: Bureau of Labor Statistics, shaded area indicates a recession.

> return to 2 percent inflation. Our resolve is firm, our goals are clear, and our tools are up to the task.[6]

Similarly, Chair Powell noted in his recent interview with the Preseident of the Cato Institure that:

> "We need to act now, forthrightly, strongly as we have been doing, and we need to keep at it until the job is done," Powell said. "The Fed has and accepts responsibility for price stability."
>
> "My colleagues and I are strongly committed to this project and we will keep at it until the job is done."[7]

B. The Use of Monetary Policy to Address Inflation

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

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

- Completed its taper of Treasury bond and mortgage-backed securities purchases[8];
- Increased the target federal funds rate beginning in March 2022 through a series of six increases from 0.00 – 0.25 percent to 3.25-4.00 percent [9,10,11,12,13].

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6 Vice Chair Lael Brainard, "Bringing Inflation Down," Clearing House and Bank Policy Institute 2022 Annual Conference, September 7, 2022.

7 Howard Schneider and Ann Saphir, "Fed's Powell hopeful inflation can be tamed without pain of Volcker era," Reuters, September 8, 2022.

8 Source: 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.

9 Federal Reserve, Press Release, March 16, 2022.

10 Federal Reserve, Press Release, May 4, 2022.

11 Federal Reserve, Press Release, June 15, 2022.

12 Federal Reserve Press Release, September 22, 2022.

13 Federal Reserve Press Release, November 2, 2022.

- Anticipates ongoing increases in the target range will be appropriate to achieve its goals of maximum employment at the inflation rate of 2 percent over the long-run;[14]

- Began reducing its holdings of Treasury and mortgage-backed securities on June 1, 2022.[15] The Federal Reserve is reducing the size of its balance sheet by only reinvesting principal payments on owned securities after the total amount of payments received exceeds a defined cap. For Treasury Securities, the cap is set at $30 billion per month for the first three months and $60 billion per month after the first three months. The cap for mortgage-backed securities is set at $17.5 billion per month for the first three months and $35 billion per month thereafter.[16]

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

Q. What effect will inflation and Federal Reserve's normalization of monetary policy have on long-term interest rates?

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

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14 Federal Reserve, Press Release, July 27, 2022.

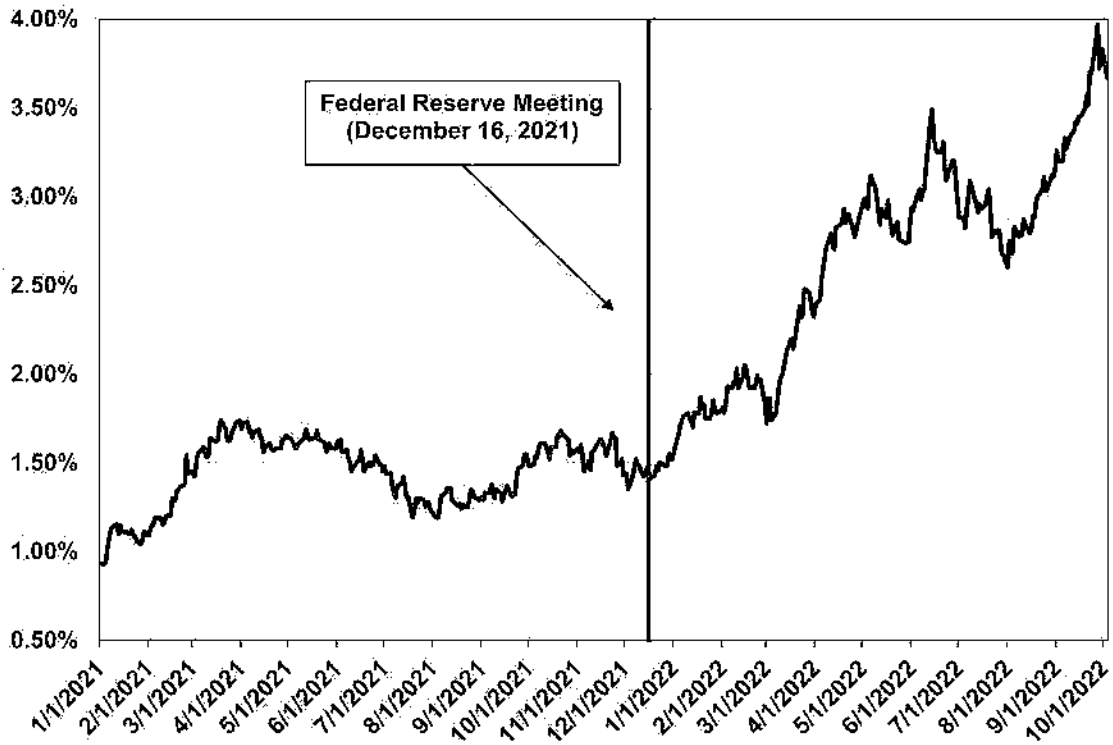
15 Source: Federal Reserve, Press Release, (May 4, 2022).

16 Source: Federal Reserve, Plans for Reducing the Size of the Federal Reserve's Balance Sheet, Press Release, (May 4, 2022).

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

A. Yes, they have. At the FOMC meetings throughout 2022, the Federal Reserve has continued to note its concerns over the sustained increased levels of inflation and has continued to accelerate the process of normalizing monetary policy to combat inflation. As shown in Figure 4 since the Federal Reserve's December 2021 meeting, the yield on 10-year Treasury bond has more than doubled, increasing from 1.47 percent on December 15, 2021 to 3.67 percent on October 31, 2022. The increase is due to the Federal Reserve's announcements at the each of the meetings since December 2021, and the continued increased levels of inflation that are now expected to persist much longer than the Federal Reserve and investors had originally projected.

Figure 4: 10-Year Treasury Bond Yield—Janaury 2021– October 2022[17]



Q. Do recent changes in GDP affect the current outlook for inflation and interest rates?

A. No. While FOMC participants have reduced their projections for economic activity for real GDP growth of 0.2 percent in 2022 and 1.2 percent in 2023, which is well below the median estimate for the longer-run normal GDP growth rate, the Fed has highlighted that the labor market continues to be extremely tight. Specifically, Chair Powell noted at the September 2022 FOMC meeting that unemployment remained near 50-year lows and job vacancies near historical highs. Therefore, with a tight labor market and persistently high

[17] S&P Capital IQ Pro.

inflation, the Fed has indicated its need to continue a restrictive monetary policy to moderate demand to better align it with supply.[18]

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

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

A. Yes. Interest rates and utility share prices are inversely correlated which means, for example, that an increase in interest rates will result in a decline in the share prices of utilities. For example, Goldman Sachs and Deutsche Bank examined the sensitivity of share prices of different industries to changes in interest rates over the past five years. Both Goldman Sachs and Deutsche Bank found that utilities had one of the strongest negative relationships with bond yields (i.e., increases in bond yields resulted in the decline of utility share prices).[19]

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

A. Equity analysts project that utilities will underperform the broader market as interest rates increase. Fidelity recently classified the utility sector as underweight[20] and Morningstar

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18 Federal Reserve, Transcript of Chair Powell's Press Conference, September 21, 2022.

19 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.

20 Fidelity, "Top sectors to watch in Q2," August 3, 2022.

recently noted that a long as inflation persists the utility sector will underperform.[21] Specifically, Morningstar noted that:

> [a]s long as inflation remains the market's top concern, we expect utilities to underperform. Utilities are the most sensitive to inflation because of their mostly fixed revenue, large capital investment budgets, and borrowing needs. We think long-term investors who want utilities in their portfolios should focus on those in constructive regulatory environments with the most protection from inflation.[22]

Q. Have you reviewed any market indicators that may imply that utilities will underperform over the near-term?

A. Yes, I have. As discussed above, the utility sector is considered a "bond proxy" or a sector that investors view as a "safe haven" alternative to bonds, and changes in utility stock prices are therefore inversely related to changes in interest rates. For example, the utility sector tends to perform well when interest rates are low since the dividend yields for utilities offer investors the prospect of higher returns when compared to the yields on long-term government bonds. Conversely, the utility sector underperforms as the yields on long-term government bonds increase and the spread between the dividend yields on utility stocks and the yields on long-term government bonds decreases. Therefore, I examined the difference ("yield spread") between the dividend yields of utility stocks and the yields on long-term government bonds from January 2010 through August 2022. I selected the dividend yield on the S&P Utilities Index as the measure of the dividend yields for the

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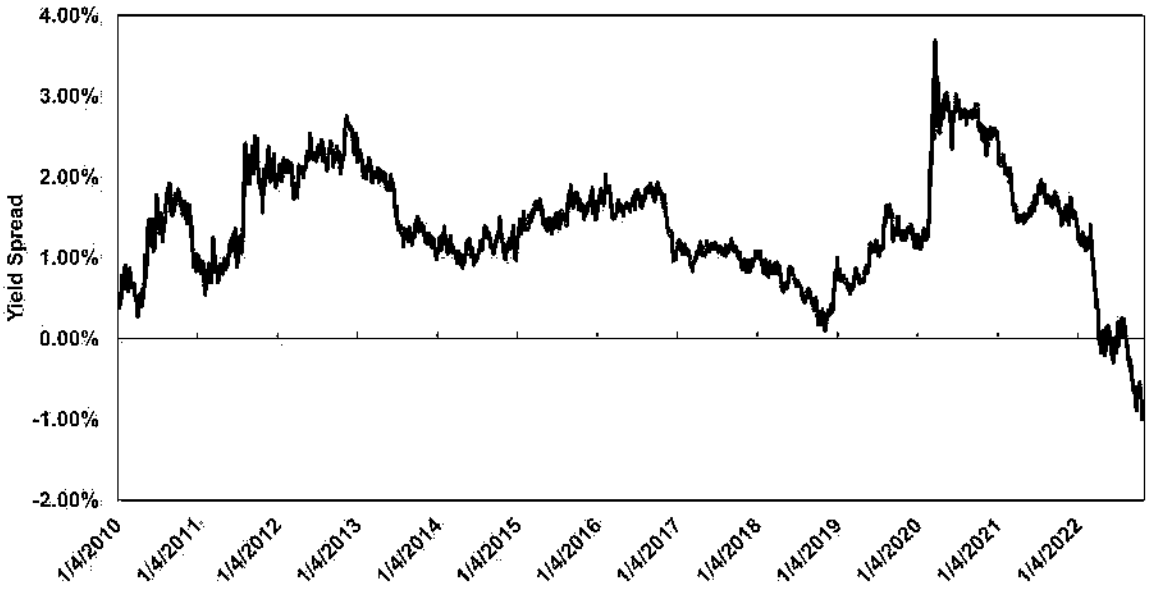
[21] Miller, Travis, "As Long as Inflation Worries Persist, We Expect Utilities to Underperform: Renewable energy continues to be a long-term boon for the sector," July 6, 2022.

[22] *Ibid.*

utility sector and the yield on the 10-year Treasury Bond as the estimate of the yield on long-term government bonds.

As shown in Figure 5, the yield spread as of October 31, 2022, was -0.99 percent indicating that the yield on the 10-year Treasury Bond has exceeded the dividend yield for the S&P Utilities Index. Furthermore, the current yield spread of -0.99 percent is well below the long-term average since January 2010 of 1.41 percent. Given that the yield spread is currently well below the long-term average as well as the expectation that interest rates will continue to increase, it is reasonable to conclude that utility sector will most likely underperform over the near-term. This is because investors that purchased utility stocks as an alternative to the lower yields on long-term government bonds would otherwise be inclined to rotate back into government bonds, particularly as the yields on long-term government bonds continue to increase, thus resulting in a decrease in the share prices of utilities.

Figure 5 Yield Spread between the Dividend Yield on the S&P Utilities Index and the Yield on the 10-year Treasury Bond – January 2012 – October 2022[23]

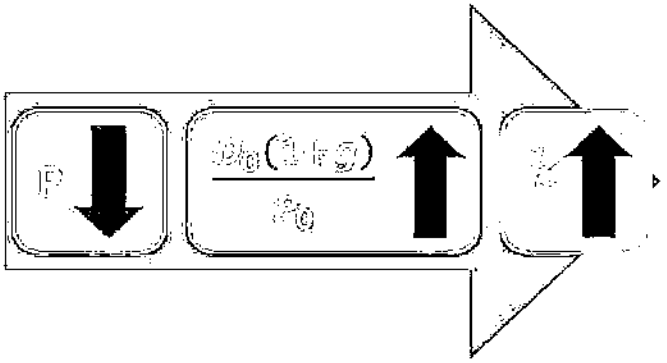


Q. What is the significance of the inverse relationship between interest rates and utility share prices in the current market?

A. As discussed above, the Federal Reserve is currently normalizing monetary policy in response to inflation which actions are expected to increase long-term government bond yields. If interest rates increase as expected, then the share prices of utilities will decline. If the prices of utility stocks decline, then the DCF model, which relies on historical averages of share prices, is likely to understate the cost of equity. For example, Figure 6, below summarizes the effect of price on the dividend yield in the Constant Growth DCF model.

23. S&P Capital IQ Pro and Bloomberg Professional.

Figure 6: The Effect of a Decline in Stock Prices on the Constant Growth DCF Model



A decline in stock prices will increase the dividend yields and thus the estimate of the COE produced by the Constant Growth DCF model. Therefore, this expected change in market conditions supports consideration of the range of COE results produced by the mean to mean-high DCF results since the mean DCF results would likely understate the cost of equity during the period that the Company's rates will be in effect. Moreover, prospective market conditions warrant consideration of other COE estimation models such as the CAPM and ECAPM, which may better reflect expected market conditions. For example, two out of three inputs to the CAPM (*i.e.*, the market risk premium and risk-free rate) are forward-looking.

Q. Have regulatory commissions acknowledged that the DCF model might understate the COE given the current capital market conditions of high inflation and increasing interest rates?

A. Yes. For example, in its May 2022 decision in establishing the cost of equity for Aqua Pennsylvania, Inc., the Pennsylvania Public Utility Commission ("PPUC") specifically concluded that the current capital market conditions of high inflation and increasing

interest rates has resulted in the DCF model understating the utility cost of equity, and that weight should be placed on risk premium models, such as the CAPM, in the determination of the ROE:

> To help control rising inflation, the Federal Open Market Committee has signaled that it is ending its policies designed to maintain low interest rates. Aqua Exc. at 9. Because the DCF model does not directly account for interest rates, consequently, it is slow to respond to interest rate changes. However, I&E's CAPM model uses forecasted yields on ten-year Treasury bonds, and accordingly, its methodology captures forward looking changes in interest rates.
>
> Therefore, our methodology for determining Aqua's ROE shall utilize both I&E's DCF and CAPM methodologies. As noted above, the Commission recognizes the importance of informed judgment and information provided by other ROE models. In the 2012 PPL Order, the Commission considered PPL's CAPM and RP methods, tempered by informed judgment, instead of DCF-only results. We conclude that methodologies other than the DCF can be used as a check upon the reasonableness of the DCF derived ROE calculation. Historically, we have relied primarily upon the DCF methodology in arriving at ROE determinations and have utilized the results of the CAPM as a check upon the reasonableness of the DCF derived equity return. As such, where evidence based on other methods suggests that the DCF-only results may understate the utility's ROE, we will consider those other methods, to some degree, in determining the appropriate range of reasonableness for our equity return determination. In light of the above, we shall determine an appropriate ROE for Aqua using informed judgement based on I&E's DCF and CAPM methodologies.[24]
>
> .....
>
> We have previously determined, above, that we shall utilize I&E's DCF and CAPM methodologies. I&E's DCF and CAPM produce a range of reasonableness for the ROE in this proceeding from 8.90% [DCF] to 9.89% [CAPM]. Based upon our informed judgment, which includes consideration of a variety of factors, including increasing inflation leading to increases in interest

[24] *Penn. Pub. Util. Comm'n et.al. v, Aqua Penn. Wastewater Inc.*, Pennsylvania Public Utility Commission, Docket Nos. R-2021-3027385 and R-2021-3027386, Opinion and Order, May 12, 2022, pp. 154–155.

rates and capital costs since the rate filing, we determine that a base ROE of 9.75% is reasonable and appropriate for Aqua.[25]

E. Conclusion

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

A. Over the near-term, investors expect long-term interest rates to increase in response to continued elevated levels of inflation and the Federal Reserve's normalization of monetary policy. Because the share prices of utilities are inversely correlated to interest rates, an increase in long-term government bond yields will likely result in a decline in utility share prices, which is the reason a number of equity analysts expect the utility sector to underperform over the near-term. The expected underperformance of utilities means that DCF models using recent historical data likely underestimate investors' required return over the period that rates will be in effect. This change in market conditions also supports the use of other COE estimation models such as the CAPM and the ECAPM, which may more directly reflect expected market conditions.

VI. PROXY GROUP SELECTION

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

A. In this proceeding, we focus on estimating the cost of equity for an electric utility company that is not itself publicly traded. Because the cost of equity is a market-based concept and

[25] *Id.*, Opinion and Order, May 12, 2022, pp. 177–178.

because UNS Electric's operations do not make up the entirety of a publicly traded entity, it is necessary to establish a group of companies that is both publicly traded and comparable to UNS Electric in certain fundamental business and financial respects to serve as its "proxy" in the COE estimation process.

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

Q. Please provide a brief profile of UNS Electric.

A. UNS Electric provides electric utility service (generation, transmission and distribution) to approximately 100,000 customers across Arizona.[26] UNS Electric currently has an investment grade long-term rating of A3 (Outlook: Stable) from Moody's[27].

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

A. I began with the group of 36 companies that Value Line classifies as Electric Utilities and applied the following screening criteria to select companies that:

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26 Source: Company website.

27 Source: Moody's Investors Service, Credit Opinion, April 12, 2022.

- pay consistent quarterly cash dividends, because companies that do not cannot be analyzed using the Constant Growth DCF model;
- have investment grade long-term issuer ratings from S&P and/or Moody's;
- are covered by at least two utility industry analysts;
- have positive long-term earnings growth forecasts from at least two utility industry equity analysts;
- own regulated generation assets that are included in rate base;
- derive more than 40.00 percent of their megawatt-hour sales from their owned generation facilities.
- derive more than 60.00 percent of their total operating income from regulated operations;
- derive more than 60.00 percent of their total regulated operating income from regulated electric operations; and
- were not parties to a merger or transformative transaction during the analytical periods relied on.

Q. Did you exclude any companies from that proxy group?

A. Yes. I excluded Pinnacle West Capital Corporation ("PNW") and Hawaiian Electric Industries, Inc. ("HE"). For PNW, the share price decreased approximately 24 percent over a two-month period from October through November 2021 resulting from a negative regulatory decision issued by the Commission for its largest operating company, Arizona Public Service Company ("APS"). Therefore, similar to the reason that I exclude transformative transactions; because the stock price can be affected by one-time events, I also excluded PNW from the proxy group.

HE's operations are concentrated on the islands of Hawaii; therefore, the company faces geographic concentration risk. As HE noted in the company's 2021 Form 10-K:

> The Company is subject to the risks associated with the geographic concentration of its businesses and current lack of interconnections that could result in service interruptions at the Utilities or higher default rates on loans held by ASB [American Savings Bank].[28]

The increased risk of service interruptions resulting from HE's geographic location which could result in revenue loss and increased costs is a risk unique to HE and would not apply to utilities located on the U.S. mainland. Furthermore, HE's unregulated operations which represent approximately 33 percent of the company's operation income in 2021 are concentrated in the banking sector through the ownership of American Savings Bank ("ASB").[29] ASB also only operates on Hawaii; thus, all of the company's consumer and commercial loans are to customers on Hawaii. If Hawaii were to face an adverse economic or political event, ASB could face severe financial effects given the company's geographic concentration in Hawaii.[30] Considering HE's unique geographic risks, I have excluded HE from my proxy group.

Q. What is the composition of your proxy group?

A. The screening criteria discussed above is shown in Exhibit AEB-2 and resulted in a proxy group consisting of the companies shown in Figure 7 below.

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[28] Hawaii Electric Industries, Inc., 2021 Form 10-K, at 23.
[29] *Id.*, at 86.
[30] *Id.*, at 20.

Figure 7: Proxy Group

Company	Ticker
ALLETE, Inc.	ALE
Alliant Energy Corporation	LNT
Ameren Corporation	AEE
American Electric Power Company, Inc.	AEP
Duke Energy Corporation	DUK
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
Xcel Energy Inc.	XEL

Q. Is the proxy group reasonably comparable to UNS Electric?

A. Yes. While there are differences between the proxy group companies and UNS Electric, in developing the proxy group it is necessary to balance the need to establish a risk-comparable proxy group with having a proxy group that is of sufficient size. This proxy group balances those interests. Further, in Section VIII of my testimony, I compare the proxy group companies to UNS Electric in terms of size and other business risk attributes and consider those differences in establishing my recommended ROE for UNS Electric.

VII. COST OF EQUITY ESTIMATION

Q. Please briefly discuss the COE in the context of the regulated rate of return ("ROR").

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

Q. How is the required COE estimated?

A. While the cost of debt can be directly observed, the cost of equity is market-based and, therefore, must be estimated based on observable market information. The COE is estimated by using one or more analytical techniques that rely on market data to quantify investor expectations regarding the range of required equity returns. Informed judgment is applied, based on the results of those analyses, to determine where within the range of results the cost of equity for a company falls. As a general proposition, the key consideration in determining the cost of equity is to ensure that the methodologies employed reasonably reflect investors' views of the financial markets, the proxy group companies, and the subject company's risk profile.

Q. What methods did you use to determine the ROE for UNS?

A. I considered the results of the Constant Growth DCF model, the CAPM, the ECAPM, and the Bond Yield Plus Risk Premium Analysis. As discussed in more detail below, a

reasonable ROE estimate appropriately considers alternative methodologies to estimate the COE and the reasonableness of their individual and collective results.

A. Importance of Multiple Analytical Approaches

Q. Why do you believe it is important to use more than one analytical approach?

A. Because the cost of equity is not directly observable, it must be estimated based on both quantitative and qualitative information. When faced with the task of estimating the cost of equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed. As a result, a number of models have been developed to estimate the cost of equity. For that reason, I use multiple approaches to estimate the cost of equity. As a practical matter, however, all of the models available for estimating the cost of equity are subject to limiting assumptions or other methodological constraints. Consequently, many finance texts recommend using multiple approaches when estimating the cost of equity. For example, Copeland, Koller, and Murrin[31] suggest using the CAPM and Arbitrage Pricing Theory model, while Brigham and Gapenski[32] recommend the CAPM, DCF, and "bond yield plus risk premium" approaches.

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[31] 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.

[32] Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed. (Orlando: Dryden Press, 1994), at 341.

Q. Do current market conditions increase the importance of using more than one analytical approach?

A. Yes. Interest rates have increased and are expected to continue to increase from the lows as a result of the COVID-19 pandemic. Given the inverse relationship between interest rates and utility share prices, the dividend yields of utilities are expected to increase over the near-term. Therefore, the current low dividend yields for utilities result in DCF cost of equity estimates that are understating the forward-looking cost of equity. The CAPM and Bond Yield Plus Risk Premium method offer some balance through the use of projected interest rates. Therefore, it is important to use multiple analytical approaches to ensure that the ROE results reflect the market conditions that are expected during the period that UNS's rates will be in effect. Given the expectation that interest rates will increase, it is important to moderate the impact that the current lower interest rates are having on the ROE estimates, especially the DCF analysis, and where possible consider using projected market data in the models to estimate the return for the forward-looking period

Q. Has the Commission recognized that it is important to consider current market conditions and the results of multiple COE estimation models?

A. Yes. In its order in the Company's 2015 case, Docket No. E-04204A-15-0142, the Commission authorized an ROE of 9.50 percent which the Commission noted was supported by the evidence in the case.[33] Specifically, the Commission noted that:

> [t]he estimates for the Cost of Equity in this proceeding range from 8.75 percent by TASC to UNSE's 10.35 percent. The agreed 9.5 percent is within the range

[33] Decision No. 75697 (August 18, 2016), at 18.

> and supported by the evidence. Although UNSE's financial metrics, such as its bond rating and capitalization, have improved since its last rate case due to the financial support of its parent Fortis, interest rates are rising, and UNSE faces significant risks from challenging economic conditions in its service area, declining energy sales, and a current rate design that requires substantial modification in order to comply with traditional principles of cost causation. A Cost of Equity of 9.5 percent is not unreasonable in this case.[34]

Therefore, the Commission considered the results of the various models presented by the parties in the case such as the DCF, CAPM and Risk Premium and capital market conditions as the Commission noted that interest rates were rising at the time of the decision. Thus, the Commission has recognized the importance of considering the results of each model presented in the rate case and market conditions since changes in market conditions can affect the model results.

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

A. Yes, several regulatory commissions consider the results of multiple COE estimation methodologies such as the DCF, CAPM, and ECAPM in determining the authorized ROE, including the Minnesota Public Utilities Commission ("Minnesota PUC"),[35], the Michigan Public Service Commission ("Michigan PSC"),[36] the Iowa Utilities Board ("IUB"),[37] the

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34 *Ibid.*

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

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

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

Washington Utilities and Transportation Commission ("Washington UTC")[38] and the New Jersey Board of Public Utilities ("NJBPU")[39]. For example, the Washington UTC has repeatedly emphasized that it "places value on each of the methodologies used to calculate the cost of equity and does not find it appropriate to select a single method as being the most accurate or instructive."[40] The Washington UTC has also explained that "[f]inancial circumstances are constantly shifting and changing, and we welcome a robust and diverse record of evidence based on a variety of analytics and cost of capital methodologies."[41]

Additionally, in its recent order for DTE Gas Company ("DTE Gas") in Case No. U-18999, the Michigan PSC considered the results of each of the models presented by the COE witnesses, which included the DCF, CAPM, and ECAPM in the determination of the authorized ROE.[42] The Commission also considered authorized ROEs in other states, increased volatility in capital markets and the company-specific business risks of DTE Gas.

Q. What are your conclusions about the results of the DCF and CAPM models?

A. Recent market data that is used as the basis for the assumptions for both models have been affected by market conditions. As a result, relying exclusively on historical assumptions

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38 *Wash. Utils. & Transp. Comm'n v. PacifiCorp*, Docket UE-130043, Order 05, n. 89 (Dec. 4, 2013); *Wash. Utils. & Transp. Comm'n v. PacifiCorp*, Docket UE-100749, Order 06, ¶ 91 (March 25, 2011).

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

40 *Wash. Utils. & Transp. Comm'n v. PacifiCorp*, Docket UE-130043, Order 05, n. 89 (Dec. 4, 2013).

41 Wash. Utils. & Transp. Comm'n v. PacifiCorp, Docket UE-100749, Order 06, ¶ 91 (March 25, 2011).

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

in these models, without considering whether these assumptions are consistent with investors' future expectations, will underestimate the cost of equity that investors would require over the period that the rates in this case are to be in effect. In this instance, relying on the historically low dividend yields that are not expected to continue over the period that the new rates will be in effect will underestimate the COE for UNS Electric.

Furthermore, as discussed in Section V above, long-term interest rates have increased since August 2020 and this trend is expected to continue as the Federal Reserve normalizes monetary policy in response to increased inflation. Therefore, the use of current averages of Treasury bond yields as the estimate of the risk-free rate in the CAPM is not appropriate since recent market conditions are not expected to continue over the long-term. Instead, analysts should rely on projected yields of Treasury Bonds in the CAPM. The projected Treasury Bond yields result in CAPM estimates that are more reflective of the market conditions that investors expect during the period that the Company's rates will be in effect.

B. Discounted Cash Flow Model

Q. Please describe the DCF approach.

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

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

where:

- P_0 represents the current market stock price,
- $D_1 \ldots D_n$ are all expected future dividends,
- g is the growth rate,
- k is the discount rate, or required return.

Equation [1] is a standard present value calculation that can be simplified and rearranged into the following form:

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

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

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

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

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

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

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

A. In my Constant Growth DCF model, I use an average of recent trading days to calculate the price term (P_0) in the DCF model to ensure that the ROE is not skewed by anomalous events that may affect stock prices on any given trading day. The averaging period should also be reasonably representative of expected capital market conditions over the long-term. However, as discussed above, recent market data is not representative of expected market conditions over the long-term. Therefore, the results of my Constant Growth DCF model using historical data may underestimate the forward-looking cost of equity. As a result, I place more weight on the median to median-high results produced by my Constant Growth DCF model.

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

A. Yes, I did. Because utility companies tend to increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is reasonable to apply one-

half of the expected annual dividend growth rate for purposes of calculating the expected dividend yield component of the DCF model. This adjustment ensures that the expected first-year dividend yield is, on average, representative of the coming twelve-month period, and does not overstate the aggregated dividends to be paid during that time.

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

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

Q. Which sources of long-term earnings growth rates did you use?

A. My Constant Growth DCF model incorporates the following sources of long-term growth rates: (1) consensus long-term earnings growth estimates from Zacks Investment Research; (2) consensus long-term earnings growth estimates from Thomson First Call (provided by Yahoo! Finance); and (3) long-term earnings growth estimates from Value Line.

Q. How did you calculate the range of results for the Constant Growth DCF models?

A. I calculated the low result for my DCF model using the minimum growth rate (i.e., the lowest of the First Call, Zacks, and Value Line earnings growth rates) for each of the proxy group companies. Thus, the low result reflects the minimum DCF result for the proxy group. I used a similar approach to calculate the high results, using the highest growth rate for each proxy group company. The mean results were calculated using the average growth rates from all sources.

Q. Please summarize the results of your Constant Growth DCF analyses?

A. Figure 8 (see also Exhibit AEB-3) presents the range of results produced by my proxy group. As shown in Figure 8, for the proxy group, the median and mean DCF results range from 9.16 percent to 9.62 percent, and the median high and mean high results are in the range of 9.95 percent to 10.49 percent. While I also summarize the median low and mean low DCF results, given the expected underperformance of utility stocks and thus the likelihood that the DCF model is understating the COE, I do not believe it is appropriate to consider the low DCF results at this time.

Figure 8: Constant Growth Discounted Cash Flow Results[43]

	Constant Growth DCF		
	Mean Low	Mean	Mean High
30-Day Average	8.42%	9.45%	10.49%
90-Day Average	8.15%	9.18%	10.23%
180-Day Average	8.13%	9.16%	10.21%
	Median Low	Median	Median High
30-Day Average	8.10%	9.62%	10.43%
90-Day Average	7.81%	9.37%	10.02%
180-Day Average	7.88%	9.35%	9.95%

Q. What are your conclusions about the results of the Constant Growth DCF model?

A. As discussed previously, one primary assumption of the DCF model is a constant P/E ratio. That assumption is heavily influenced by the market price of utility stocks. Since utility stocks are expected to underperform the broader market over the near-term as interest rates increase, it is important to consider the results of the DCF models with caution because the DCF tends to understate the cost of equity in rising interest rate and higher inflationary environments, which, as discussed previously, currently exist. Therefore, while I have given weight to the results of the Constant Growth DCF model, my recommendation also gives weight to the results of other COE estimation models.

C. Capital Asset Pricing Model

Q. Please briefly describe the Capital Asset Pricing Model.

A. The CAPM is a risk premium approach that estimates the cost of equity for a given security as a function of a risk-free return plus a risk premium to compensate investors for the non-

[43] *See* Exhibit AEB-3.

diversifiable or "systematic" risk of that security. This second component is the product of the market risk premium and the Beta coefficient, which measures the relative riskiness of the security being evaluated.

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

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

where:

k_e = the required market COE

β = Beta coefficient of an individual security

r_f = the risk-free rate of return

r_m = the required return on the market as a whole

In this specification, the term $(r_m - r_f)$ represents the market risk premium. According to the theory underlying the CAPM, investors should be concerned only with systematic or non-diversifiable risk because unsystematic risk can be diversified away. Non-diversifiable risk is measured by the Beta coefficient, which is defined as:

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

The variance of the market return, noted in Equation [4], is a measure of the uncertainty of the general market, and the covariance between the return on a specific security and the market reflects the extent to which the return on that security will respond to a given change in the market return.

Q. What risk-free rate did you use in your CAPM model?

A. I used three estimates of the yield on Treasury bonds: (1) the current 30-day average yield on 30-year Treasury bonds (3.92 percent);[44] (2) the projected 30-year Treasury yield for Q1 2023 through Q1 2024 (4.00 percent);[45] and (3) the projected 30-year Treasury yield for the period 2024-2028 (3.80 percent).[46]

Q. How would you weight these scenarios?

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

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

A. As shown in Exhibit AEB-4, I used the Beta coefficients for the proxy group companies as reported by Bloomberg and Value Line. The Beta coefficients reported by Bloomberg were calculated using ten years of weekly returns relative to the S&P 500 Index. Value

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44 Bloomberg Professional.
45 Blue Chip Financial Forecasts, Vol. 41, No. 11, November 1, 2022, p. 2.
46 Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, p. 14.

Line's calculation is based on five years of weekly returns relative to the New York Stock Exchange Composite Index.

Additionally, as shown in Exhibit AEB-5, I also considered an additional CAPM analysis which relies on the long-term average utility Beta coefficient for the companies in my proxy group. The long-term average utility Beta coefficient was calculated as an average of the Value Line Beta coefficients for the companies in my proxy group from 2016 through 2021.

Q. How did you estimate the Market Risk Premium in the CAPM?

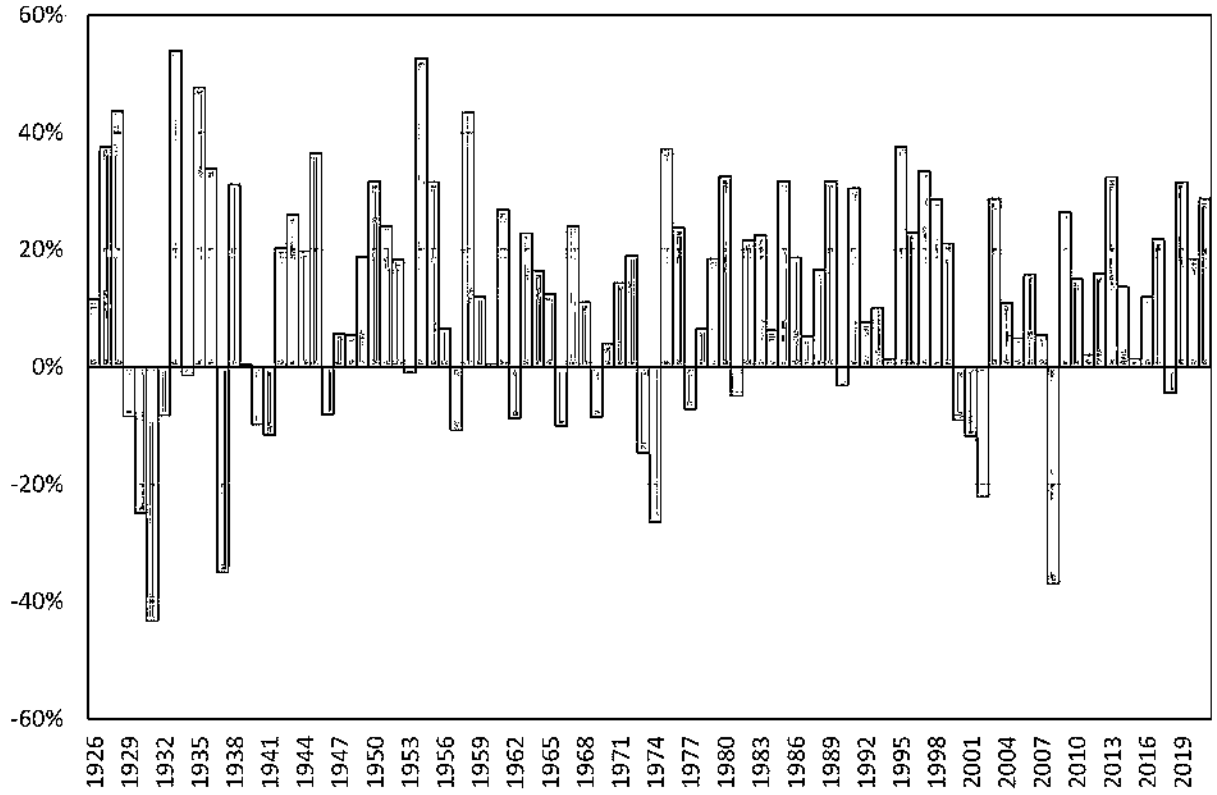
A. I estimated the Market Risk Premium ("MRP") as the difference between the implied expected equity market return and the risk-free rate. As shown in Exhibit AEB-6, the expected return on the S&P 500 Index is calculated using the Constant Growth DCF model for the companies in the S&P 500 Index. Based on an estimated market capitalization-weighted dividend yield of 1.84 percent and a weighted long-term growth rate of 10.82 percent, the estimated required market return for the S&P 500 Index is 12.76 percent.

Q. How does the current expected market return of 12.68 percent compare to observed historical market returns?

A. Given the range of annual equity returns that have been observed over the past 96 years (shown in Figure 9 below), a current expected return of 12.76 percent is not unreasonable.

In approximately half of the past 96 years, the realized total equity return was at least 12.76 percent or greater.

Figure 9: Realized U.S. equity market returns (1926-2021)[47]



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

A. Yes. I have also considered the results of an Empirical CAPM ("ECAPM" or alternatively referred to as the Zero-Beta CAPM)[48] in estimating the cost of equity for UNS Electric. The ECAPM calculates the product of the adjusted Beta coefficient and the market risk premium and applies a weight of 75.00 percent to that result. The model then applies a 25.00 percent weight to the market risk premium, without any effect from the Beta

[47] Depicts total annual returns on large company stocks, as reported in the 2022 SBBI Yearbook.

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

coefficient. The results of the two calculations are summed, along with the risk-free rate, to produce the ECAPM result, as noted in Equation [4] below:

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

where:

k_e = the required market ROE

β = Adjusted Beta coefficient of an individual security

r_f = the risk-free rate of return

r_m = the required return on the market as a whole

In essence, the Empirical form of the CAPM addresses the tendency of the "traditional" CAPM to underestimate the cost of equity for companies with low Beta coefficients such as regulated utilities. In that regard, the ECAPM is not redundant with the use of adjusted Betas; rather, it recognizes the results of academic research indicating that the risk-return relationship is different (in essence, flatter) than estimated by the CAPM, and that the CAPM underestimates the "alpha," or the constant return term.[49]

As with the CAPM, my application of the ECAPM uses the forward-looking market risk premium estimates, the three yields on 30-year Treasury securities noted earlier as the risk-free rate, and the Bloomberg, Value Line and long-term average Beta coefficients.

[49] *Id.* at 191.

Q. What are the results of your CAPM analyses?

A. As shown in Figure 10 (see also Exhibit AEB-4), my traditional CAPM analysis produces a range of returns from 10.49 percent to 11.65 percent. The ECAPM analysis results range from 11.06 percent to 11.94 percent.

Figure 10: CAPM Results

	Current Risk-Free Rate (3.92%)	Q1 2023 – Q1 2024 Projected Risk-Free Rate (4.00%)	2024-2028 Projected Risk-Free Rate (3.80%)
	CAPM		
Value Line Beta	11.67%	11.68%	11.65%
Bloomberg Beta	11.16%	11.19%	11.15%
Long-Term Avg. Beta	10.50%	10.52%	10.47%
	ECAPM		
Value Line Beta	11.94%	11.95%	11.93%
Bloomberg Beta	11.56%	11.58%	11.55%
Long-Term Avg. Beta	11.06%	11.08%	11.04%

Q. Why is it important to consider the results of the risk premium approaches using projected yields on Treasury bonds?

A. As discussed in Section V above, interest rates have been increasing and are expected to continue to increase in response to inflationary pressure. The FOMC has increased the federal funds rate five times in 2022 and has stated the intention to continue to increase rates to address persistently high inflation, which remains near 40 year highs. Further, the duration of a rate proceeding in Arizona is approximately 17 months, which is significantly longer than the typical rate case duration. Therefore, there is good reason to expect that during the pendency of this proceeding, interest rates will be increasing, and affecting the cost of equity. Based on these two factors, it is important to ensure that the cost of equity

that is determined in this proceeding take into consideration the cost of equity that will be expected over the period that the rates determined in this proceeding will be in effect.

D. Bond Yield Plus Risk Premium Analysis

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

A. In general terms, this approach is based on the fundamental principle that equity investors bear the residual risk associated with equity ownership and therefore require a premium over the return they would have earned as a bondholder. That is, 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 electric utility companies as the historical measure of the cost of equity to determine the risk premium.

Q. Are there other considerations that should be addressed in conducting this analysis?

A. Yes. It is important to recognize both academic literature and market evidence indicating that the equity risk premium (as used in this approach) is inversely related to the level of interest rates. That is, as interest rates increase (decrease), the equity risk premium decreases (increases). Consequently, it is important to develop an analysis that: (1) reflects the inverse relationship between interest rates and the equity risk premium; and (2) relies on recent and expected market conditions. Such an analysis can be developed based on a regression of the risk premium as a function of U.S. Treasury bond yields. If we let

authorized ROEs for electric utilities serve as the measure of required equity returns and define the yield on the long-term U.S. Treasury bond as the relevant measure of interest rates, the risk premium simply would be the difference between those two points.[50]

Q. Is the Bond Yield Plus Risk Premium analysis relevant to investors?

A. Yes. Investors are aware of ROEs that have been authorized in other jurisdictions, and they consider those returns as a benchmark for a reasonable level of equity returns for utilities of comparable risk operating in other jurisdictions. Because my Bond Yield Plus Risk Premium analysis is based on authorized ROEs for utility companies relative to corresponding Treasury yields, it provides relevant information to assess the return expectations of investors.

Q. What did your Bond Yield Plus Risk Premium analysis reveal?

A. As shown in Figure 11 below, from 1992 through October 2022, there was a strong negative relationship between risk premia and interest rates. To estimate that relationship, I conducted a regression analysis using the following equation:

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

Where

[50] *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.

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

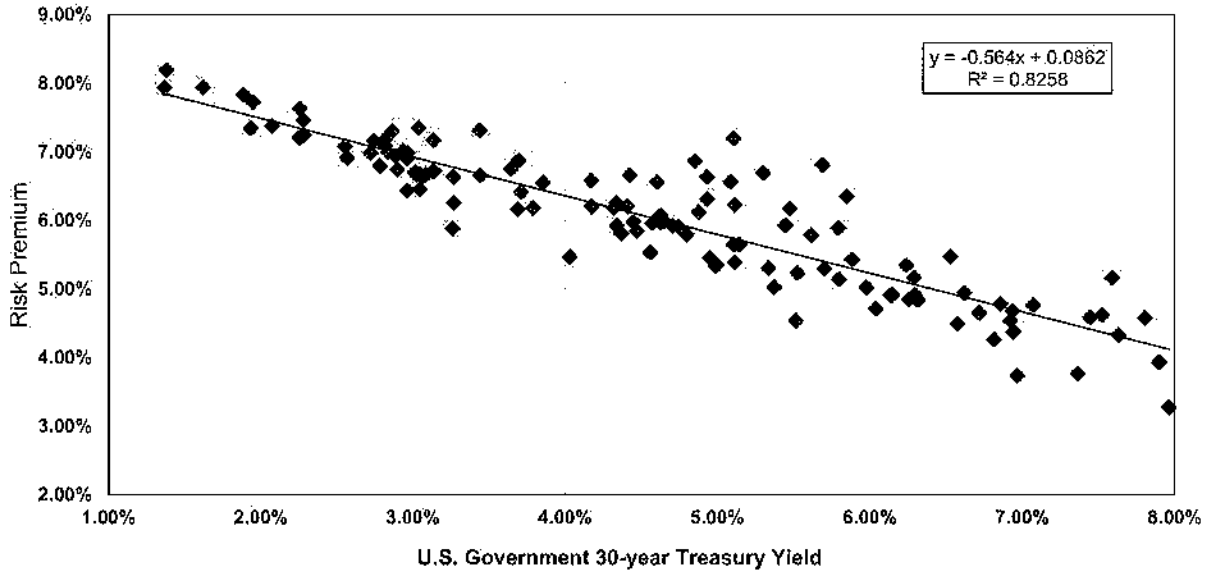
a = intercept term

b = slope term

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

Data regarding allowed ROEs were derived from vertically-integrated electric utility rate cases from 1992 through October 2022 as reported by Regulatory Research Associates ("RRA").[51] This equation's coefficients were statistically significant at the 99.00 percent level.

Figure 11: Risk Premium Results



[51] This analysis began with a total of 1,396 cases and was screened to eliminate limited issue rider cases, transmission-only cases, distribution cases and cases that were silent with respect to the authorized ROE. After applying those screening criteria, the analysis was based on data for 683 cases.

As shown on Exhibit AEB-7, based on the current 30-day average of the 30-year U.S. Treasury bond yield (i.e., 3.92 percent), the risk premium would be 6.41 percent, resulting in an estimated ROE of 10.32 percent. Based on the near-term (Q1 2023 – Q1 2023) projections of the 30-year U.S. Treasury bond yield (i.e., 4.00 percent), the risk premium would be 6.36 percent, resulting in an estimated ROE of 10.36 percent. Based on longer-term (2024-2028) projections of the 30-year U.S. Treasury bond yield (i.e., 3.80 percent), the risk premium would be 6.47 percent, resulting in an estimated ROE of 10.27 percent.

Q. How did the results of the Bond Yield Risk Premium inform your recommended ROE for UNS Electric?

A. I have considered the results of the Bond Yield Risk Premium analysis in setting my recommended ROE for UNS Electric. As noted above, investors consider the ROE determination by a regulator when assessing the risk of that company as compared to utilities of comparable risk operating in other jurisdictions. The risk premium analysis takes into account this comparison by estimating the return expectations of investors based on the very recent and past ROE awards of electric utilities across the U.S.

VIII. REGULATORY AND BUSINESS RISKS

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

A. No. These results provide only a range of the appropriate estimate of the Company's cost of equity. There are several additional factors that must be taken into consideration when

determining where the Company's cost of equity falls within the range of results. These factors, which are discussed below, should be considered with respect to their overall effect on the Company's risk profile.

A. Capital Expenditures

Q. Please summarize the projected capital expenditure requirements for UNS Electric.

A. The capital expenditure projections for UNS Electric are approximately $304 million for the period from 2022 through 2026.[52] The planned spending is related to reliability and to support growth in the system.

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

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

[52] Company provided data.

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

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

> When applicable, a jurisdiction's willingness to support large capital projects with cash during construction is an important aspect of our analysis. This is especially true when the project represents a major addition to rate base and entails long lead times and technological risks that make it susceptible to construction delays. Broad support for all capital spending is the most credit-sustaining. Support for only specific types of capital spending, such as specific environmental projects or system integrity plans, is less so, but still favorable for creditors. Allowance of a cash return on construction work-in-progress or similar ratemaking methods historically were extraordinary measures for use in unusual circumstances, but when construction costs are rising, cash flow support could be crucial to maintain credit quality through the spending program. Even more favorable are those jurisdictions that present an opportunity for a higher return on capital projects as an incentive to investors.[53]

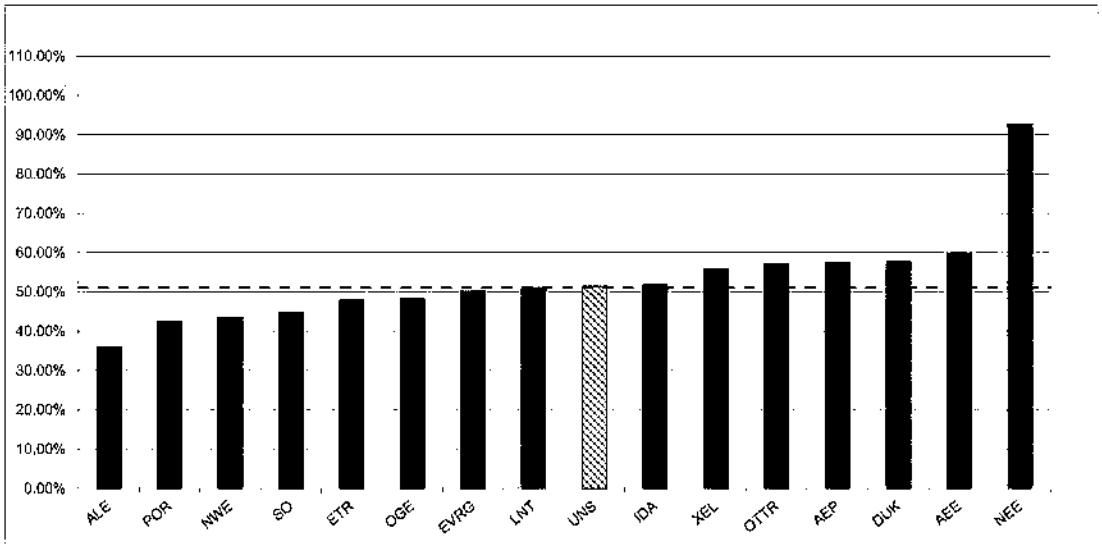
Therefore, to the extent that the Company's rates do not permit the opportunity to recover its capital investments on a regular and timely basis, the Company will face increased recovery risk and thus increased pressure on its credit metrics.

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

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

A. As shown at Exhibit AEB-8, I calculated the ratio of expected capital expenditures to net utility plant for UNS Electric and each of the companies in the proxy group by dividing each company's projected capital expenditures for the period 2023-2026 by its total net utility plant as of December 31, 2021. As shown at Exhibit AEB-8 (see also Figure 12 below), UNS Electric's ratio of capital expenditures as a percentage of net utility plant of 51.44 percent is just above the median for the proxy group companies of 51.11 percent, which suggests average risk on this basis.

Figure 12: Comparison of Capital Expenditures – Proxy Group Companies



Q. Does UNS Electric have a capital tracking mechanism to recover the costs associated with its capital expenditures plan between rate cases?

A. Yes. UNS Electric currently has Transmission Cost Adjustor ("TCA") which allows UNS Electric to recover FERC approved changes in transmission charges. However, the

Company's capital expenditures plan only has a limited number of projects that are eligible for recovery through capital cost recovery riders. Therefore, UNS Electric depends primarily on historical test year rate case filings for capital cost recovery with the associated regulatory lag.

Q. Are capital investment recovery mechanisms common amongst electric utilities?

A. Yes. As shown in Exhibit AEB-9, 74.03 percent of the companies in the proxy group have some form of capital cost recovery mechanisms in place. Therefore, the TCA does not provide any incremental risk mitigation for the financial risks associated with capital expenditures relative to the proxy group. In fact, given the limited recovery of the Company's capital expenditures plan through the TCA, it is likely that the Company's capital cost recovery risk is increased relative to the proxy group.

Q. Are you aware that the Company is proposing to implement a recovery mechanism for investments in renewable resources?

A. Yes, the Company is proposing to recover investments in owned cleaner generating resources to meet its load obligation through the proposed Resource Transition Mechanism ("RTM").[54]

[54] The RTM is discussed in the testimony of Company Witness Mr. Dukes.

Q. Have the proxy companies implemented mechanisms to recover investments in renewable resources?

A. Yes. I reviewed the mechanisms that have been implemented for the electric operating subsidiaries of the proxy group companies. Approximately 35 percent of the proxy group companies have been authorized a mechanism that recovers the investments in renewable resources. Therefore, if the Commission were to approve the Company's proposed renewables investment recovery mechanism, UNS Electric's risk profile more closely align to the proxy group. Absent such a mechanism, UNS Electric would have higher risk than the proxy group companies.

Q. What are your conclusions regarding the effect of the Company's capital spending requirements on its risk profile and cost of capital?

A. The Company's capital expenditure requirements as a percentage of net utility plant are significant and will continue over the next few years. Additionally, the Company's ability to recover capital costs on a timely basis through the TCA is limited, as the TCA rate base is approximately 15 percent of the Company's total rate base. As shown in Exhibit AEB-9 a majority of the operating subsidiaries of the proxy group have implemented capital tracking mechanisms to recover capital expenditures. Therefore, UNS Electric's significant capital expenditures plan and limited ability to recover the capital investment on an as-incurred basis result in a risk profile is greater than that of the proxy group and that supports an ROE toward the higher end of the reasonable range of ROEs.

B. Regulatory Environment

Q. Please explain how the regulatory framework affects investors' risk assessments.

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

Because investors have many investment alternatives, even within a given market sector, the Company's authorized returns must be adequate on a relative basis to ensure its ability to attract capital under a variety of economic and financial market conditions. From the perspective of debt investors, the authorized return should enable the Company to generate the cash flow needed to meet their near-term financial obligations, make the capital investments needed to maintain and expand their systems, and maintain sufficient levels of liquidity to fund unexpected events. This financial liquidity must be derived not only from internally generated funds, but also from efficient access to capital markets.

From the perspective of equity investors, the authorized return must be adequate to provide a risk-comparable return on the equity portion of the Company's capital investments.

Because equity investors are the residual claimants on the Company's cash flows (that is, debt interest must be paid prior to any equity dividends), equity investors are particularly concerned with the regulatory framework in which a utility operates and its effect on future earnings and cash flows.

Q. Please explain how Moody's considers the regulatory framework in establishing a company's credit rating.

A. Moody's considers the overall regulatory framework in establishing credit ratings. Moody's establishes credit ratings based on four key factors: (1) regulatory framework; (2) the ability to recover costs and earn returns; (3) diversification; and (4) financial strength, liquidity and key financial metrics. Of these criteria, regulatory framework and the ability to recover costs and earn returns are each given a broad rating factor of 25.00 percent. Therefore, Moody's assigns regulatory risk a 50.00 percent weighting in the overall assessment of business and financial risk for regulated utilities.[55]

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

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

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

regulatory environment and how the utility adapts to that environment are the most important credit considerations."[56] Moody's further highlighted the relevance of a stable and predictable regulatory environment to a utility's credit quality, noting: "[b]roadly speaking, the Regulatory Framework is the foundation for how all the decisions that affect utilities are made (including the setting of rates), as well as the predictability and consistency of decision-making provided by that foundation."[57]

Q. Have you conducted any analysis of the regulatory framework in Arizona relative to the jurisdictions in which the companies in your proxy group operate?

A. Yes. I have evaluated the regulatory framework in Arizona considering two factors which are important to ensuring UNS Electric maintains access to capital at reasonable terms. As I will discuss in more detail below, the two factors are: 1) cost recovery mechanisms which allow a utility to recover costs in a timely manner between rate cases and provide the utility the opportunity to earn its authorized return; and 2) comparable return standard because an awarded ROE that is significantly below the ROEs awarded to other utilities with comparable risks can affect the ability of a utility to attract capital at reasonable terms. The results of these analyses demonstrate that the jurisdictional ranking for Arizona regulation is below average. Further the recently authorized ROEs in Arizona are well below the recently authorized ROEs for other vertically integrated electric utilities across the country.

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[56] Moody's Investors Service, Rating Methodology: Regulated Electric and Gas Utilities, at 6 (June 23, 2017).

[57] *Ibid.*

1. Cost Recovery Mechanisms

Q. Have you conducted any analysis to compare the cost recovery mechanisms of Arizona to the cost recovery mechanisms approved in the jurisdictions in which the companies in your proxy group operate?

A. Yes. I selected four mechanisms that are important to provide a regulated utility an opportunity to earn its authorized ROE. These are: 1) test year convention (i.e., forecast vs. historical); 2) use of revenue decoupling mechanisms or formula-based rates that mitigate volumetric risk; 3) prevalence of capital cost recovery between rate cases; and 4) the use of purchase power and fuel cost recovery mechanisms. The results of this cost recovery assessment are shown in Exhibit AEB-9 and are summarized below.

Test year convention: UNS Electric uses a historical test year adjusted for known and measurable changes in Arizona. However, approximately 50.00 percent of the operating companies held by the proxy group provide service in jurisdictions that use a fully or partially forecasted test year. Forecast test years have been relied on for several years and produce cost estimates that are more reflective of future costs which results in more accurate recovery of incurred costs and mitigates the regulatory lag associated with historical test years.

Non-Volumetric Rate Design: UNS Electric does have some limited protection against volumetric risk through a partial revenue decoupling mechanism (Lost Fixed Cost Recovery Mechanism) that allows the Company to recover a portion of the revenues lost due to reduced sales resulting from Commission-approved energy efficiency

programs and customer installed distributed generation.[58] Similarly, 43 out of 77 (55.84 percent) of the operating companies held by the proxy group have protections against volumetric risk, mostly through mechanisms that are more robust than the LFCR and that provide more protection, such as non-volumetric rate design through either straight fixed variable rate design, revenue decoupling mechanisms or formula rate plans that allow them to break the link between customer usage and revenues.

Capital Cost Recovery: As discussed above, UNS Electric does have limited capital tracking mechanisms to recover a limited range of capital investment costs between rate cases. Similarly, 74.03 percent of the operating companies in the proxy group have some form of capital cost recovery mechanism in place.

Fuel Cost Recovery - Power Cost Adjustment Mechanism: UNS Electric has a Purchased Power and Fuel Adjustment Charge ("PPFAC") that reflects changes in energy-related costs, including the fuel for generation and the power purchases made on behalf of customers. This mechanism provides for monthly, yet limited adjustments to the true-up of any variability in the purchased power and fuel costs that are included in power supply rates. As shown in Exhibit AEB-9, 71 out of 77 of the operating jurisdictions of the proxy group companies have a Fuel and Purchased Power adjustment clause. Based on the magnitude of the costs associated with purchased

[58] Moody's Credit Opinion, UNS Electric, April 12, 2022 at 4.

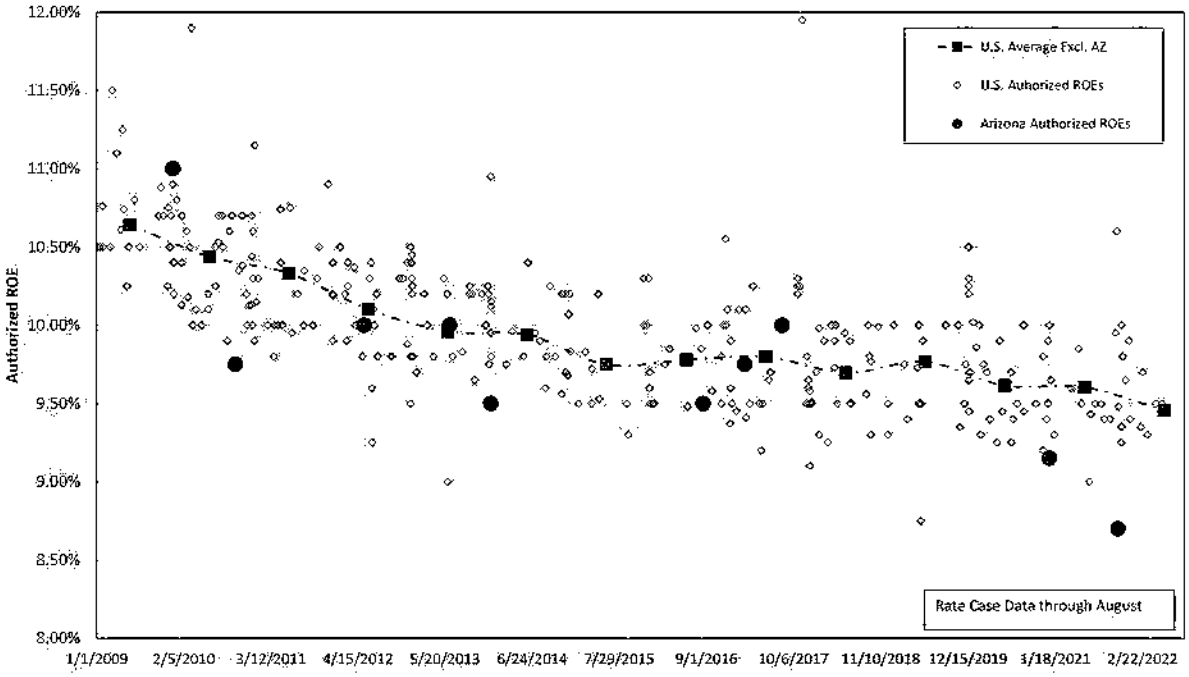
power and fuel cost recovery, if UNS Electric were not to have the PPFAC, the Company's risk profile would be significantly higher than the proxy group companies.

2. Authorized ROEs

Q. How do recent returns in Arizona compare to the authorized returns in other jurisdictions?

A. As shown in Figure 13, although the authorized ROEs for vertically integrated electric utilities established by the Commission between 2009 and 2023 were comparable or slightly below prevailing national averages at the time of the decisions, the recent authorized ROEs established by the Commission in 2020 and 2021 have been *well below* the national average. Specifically, the authorized returns for vertically integrated electric utilities in Arizona in 2020 and 2021 have been at the bottom of the range produced by the authorized ROEs from other state jurisdictions.

Figure 13: Comparison of Arizona and U.S. Authorized Vertically Integrated Electric Returns[59]



Q. Considering the return on the fair value increment awarded to electric utilities in Arizona, are the authorized ROEs in Arizona still below the average authorized ROE for electric utilities in other jurisdictions across the U.S.?

A. Yes. In fact, the manner in which the FVI has been applied in two recent energy rate cases - by reducing the ROE by an amount equivalent to the FVI - has acted to *reduce* overall return and to make Arizona utilities even less attractive for investment. Further, while the Commission did not reduce the authorized ROE for APS to account for the reduced risk

59. Source: S&P Capital IQ Pro. Electric rate case decisions from January 1, 2009 through August 30, 2022. The chart does not display the 12.88% ROE that was authorized for Alaska Electric Light and Power on September 2, 2011. The chart also excludes the authorized returns in Vermont since they are established based on a formulaic approach that is directly linked to interest rates and therefore is affected by market conditions and monetary policy.

associated with awarding a return on the fair value increment as it did in Decision No. 77850 for Southwest Gas Corporation[60] and Decision 77856 for TEP[61], the Commission did note that the authorized ROE of 8.70 percent included a reduction of 20 basis points for the customer service performance of APS.[62] Thus, the Commission found the ROE for APS to be 8.90 percent excluding the customer service penalty. However, an ROE of 8.90 percent is still 71 basis points below the 9.61 percent average authorized ROE for vertically integrated electric utilities in 2021.

Q. Do investors consider the relative returns awarded in jurisdictions across the U.S.?

A. Yes, they do. In fact, in a recent article from Barron's, an equity analyst from KeyBanc Capital Markets, Inc. recommended buying shares in Duke Energy as opposed to Consolidated Edison for reasons which included that the regulatory outcomes in the jurisdictions where Duke Energy operates were more favorable. Specifically, KeyBank analyst Sophie Karp noted:

> The regulatory environment is favorable in Duke's major markets: the Carolinas, Florida, and Indiana. "There's not so much of the utility bashing that goes on down there as it is in New York routinely," says KeyBanc's Karp. "So they have more constructive outcomes. They have better returns." A starting point of below-average customer bills helps. So does healthy population growth. New York has neither.[63]

60 Decision No. 77850 (December 17, 2020), at 70.
61 Decision No. 77856 (December 31, 2020), at 69-70.
62 Decision No. 78317 (November 9, 2021), at 323.
63 Hough, Jack. 3 Electric Utility Stocks to Give Your Portfolio a Jolt. Barron's, 26 July 2021, www.barrons.com/articles/-utility-stocks-duke-energy-51627080936?mod=hp_columnists.

Q. Should the Commission be concerned about authorizing equity returns that are at the low end of the range established by other state regulatory jurisdictions?

A. Yes. Placing UNS Electric at the low end of authorized ROEs outside Arizona over the longer term can negatively affect the Company's access to capital and the overall cost of capital. As I will discuss in more detail below, the Commission's most recent decision for APS was viewed negatively by both investors and credit rating agencies due in part to the authorized ROE of 8.70 percent which is below any authorized ROE for a vertically integrated utility in at least the last twenty years. This rate decision resulted in a 24 percent decline in the share price for PNW, the parent company of APS, increasing the overall cost of equity for that company.

Second, as noted in Sections V and VII, interest rates are expected to increase as the Federal Reserve normalizes monetary policy, and thus utilities are expected to underperform over the near-term. If utility stocks underperform over the near-term then utility dividend yields will increase resulting in higher estimates of the ROE results produced by the DCF model. Therefore, the results of the DCF model will underestimate investors' expected ROE over the time period in which UNS Electric's rates will be in effect. As a result, it is important that the Commission consider the results of alternative methods such as the forward looking CAPM, ECAPM, and Bond Yield Plus Risk Premium and the returns that have been authorized by other electric utilities across the U.S.

Q. What concerns have been raised by the rating agencies about the Arizona regulatory environment for UNS Electric?

A. In its April 2022 credit opinion update for UNS Electric, Moody's noted that UNS Electric's regulatory provisions remain generally supportive, but noted that the regulatory lag associated with the decision process in Arizona and the historical test year are challenges that negatively affect cash flow.[64] It is important to note that Moody's review of the regulatory process for UNS Electric, was based on an ROE of 9.50 percent and an equity ratio of 52.83 percent, set in by the Commission in August 2016.

Q. Do credit rating agencies consider the authorized ROE in the overall risk assessment of a utility?

A. Yes, they do. To the extent that the returns in a jurisdiction are lower than the returns that have been authorized more broadly, credit rating agencies will consider this in the overall risk assessment of the regulatory jurisdiction in which the company operates. It is important to consider credit ratings because they affect the overall cost of borrowing, and they act as a signal to equity investors about the risk of investing in the equity of a company. Therefore, lower credit ratings can affect both the cost of debt and equity. Examples of recent credit rating agency responses include ALLETE, Inc., CenterPoint Energy Houston Electric and Pinnacle West Capital Corporation. Moody's downgraded ALLETE, Inc. from A3 to Baa1 primarily based on the less than favorable outcome in Minnesota Power's last fully litigated rate case in Minnesota which included what Moody's noted was a below

[64] Moody's Investor Service, Credit Opinion, UNS Electric, Inc, Update to credit analysis, April 12, 2022, at 3.

average authorized ROE of 9.25 percent.[65] In addition, FitchRatings downgraded CenterPoint Energy Houston Electric's ("CEHE") Long-Term Issuer Default rating from A- to BBB+ and revised the rating outlook from Stable to Negative following the approval of an unfavorable outcome in a recent rate case in Texas.[66]

Q. How did the market respond to the return authorized by the Commission in the recent rate case for APS?

A. The market responded negatively to the recent rate cast decision by the Commission for APS. The Recommended Opinion and Order ("ROO") issued in the APS rate proceeding on August 2, 2021, recommended an ROE of 9.16 percent. In October 2021, that recommendation was amended to reduce the company's ROE to 8.70 percent.[67] As noted above, the final ROE that was established for APS was 8.70 percent. The market reacted strongly to the proposed order and subsequent amendment and final decision. Guggenheim Securities LLC, an equity analyst that follows PNW, the parent company of APS, informed its clients that:

> [T]he "Arizona Corporation Commission is now confirmed to be the single most value destructive regulatory environment in the country as far as investor-owned utilities are concerned".[68]

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65 Moody's Investors Service, Credit Opinion: ALLETE, Inc. Update following downgrade, at 3 (April 3, 2019).

66 FitchRatings, Fitch Downgrades CenterPoint Energy Houston Electric to BBB+; Affirms CNP; Outlooks Negative, February 19, 2020.

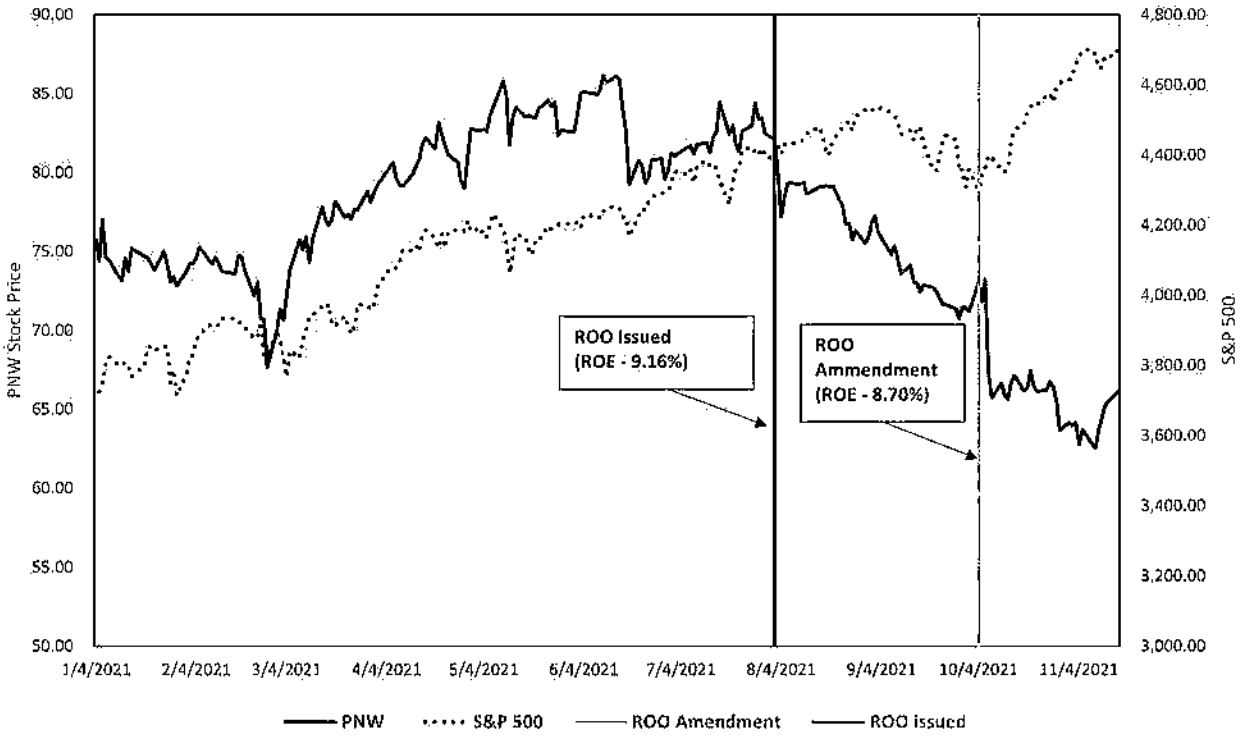
67 Arizona Corporation Commission Docket No. E-01345A-19-0236, Commissioner Olson Proposed Amendment No. 1 to the Recommended Opinion and Order. October 4, 2021.

68 S&P Global Market Intelligence, "Pinnacle West shares tumble after regulators slash returns in rate case," October 7, 2021.

S&P Global Market Intelligence (Regulatory Research Associates) noted that this decision was "among the lowest ROEs RRA had encountered in its coverage of vertically integrated electric utilities in the past 30 years."[69]

As shown in Figure 14 below, PNW's stock price declined approximately 24 percent from August 2, 2021 to November 4, 2021 following the issuance of the ROO, which recommended an ROE of 9.16 percent, and then the subsequent amendment to that opinion recommending the 8.70 percent ROE ultimately adopted by the Commission.

Figure 14: Pinnacle West Capital Stock Price vs. S&P 500 utilities



[69] S&P Global Market Intelligence, RRA Regulatory Focus, "Commission accords Arizona Public Service Company a well below average ROE," October 8, 2021.

Q. Did the ratings agencies respond to the APS decision?

A. Yes. The rating agencies responded negatively to the Commission's decision in APS' case prior to and following the decision. Specifically, in October 2021, following the Commission's hearings, FitchRatings downgraded and maintained a negative outlook for APS and its parent, as a result of the discussions regarding the outcome of the APS' rate case proceeding.[70] While the Commission had not issued a final order in APS' rate case at the time, FitchRatings noted that the developments at the hearing in October indicate a likely credit negative outcome that would negatively affect the financial metrics of both APS and PNW. It is also important to note that both Standard & Poor's and Moody's downgraded PNW's and APS' credit rating and put the companies on credit watch negative following the Commission's November vote on the rate case decision including an authorized ROE of 8.70 percent.[71]

Q. Did the market reaction affect PNW's plans to raise capital?

A. Yes. In November 2021, following the stock market and credit rating agencies response to the regulatory decision, PNW deferred an equity issuance until after its next rate decision in 2024 in order to protect shareholders from further dilution, reduce O&M expenses, and optimize its balance sheet and capital program.[72]

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

71 *See* S&P Capital IQ and Moody's Investors Service, "Rating Actions: Moody's downgrades Pinnacle West to Baa1 and Arizona Public Service to A3; outlook negative," (Nov. 17, 2021).

72 Pinnacle West Capital Corporation NYSE: PNW FQ3 2021 Earnings Call Transcripts, November 5, 2021, at 7-8.

Q. How should the Commission use the information regarding the response to the APS decision and authorized ROEs in other jurisdictions in determining the ROE for UNS Electric?

A. As discussed above, the companies in the proxy group operate in multiple jurisdictions across the U.S. Since UNS Electric must compete directly for capital with investments of similar risk, it is appropriate to review the authorized ROEs in other jurisdictions. The comparison is important because investors are considering the authorized returns across the U.S. and are likely to invest equity in those utilities with the highest returns. This consideration is particularly important for Arizona given the negative market response to the recently authorized ROE for APS which implies that the authorized return for APS did not meet the comparable return standard of *Hope* and *Bluefield*.

Q. Have you developed any additional analyses to evaluate the regulatory environment in Arizona as compared to the jurisdictions in which the companies in your proxy group operate?

A. Yes. I have conducted two additional analyses to compare the regulatory framework of Arizona to the jurisdictions in which the companies in the proxy group operate. Specifically, I considered two different rankings: (1) the Regulatory Research Associates ("RRA") ranking of regulatory jurisdictions; and (2) S&P's ranking of the credit supportiveness of regulatory jurisdictions.

Q. Please explain how you used the RRA ratings to compare the regulatory jurisdictions of the proxy companies with the Company's regulatory jurisdiction.

A. RRA develops their ranking based on their assessment of how investors perceive the regulatory risk associated with ownership of utility securities in that jurisdiction, specifically reflecting their assessment of the probable level and quality of earnings to be realized by the State's utilities as a result of regulatory, legislative, and court actions. As shown in Figure 15 below, RRA assigns a ranking for each regulatory jurisdiction between "Above Average/1" to "Below Average/3," with nine total rankings between these categories.

Figure 15: RRA Rankings Summary

RRA Ranking	Numerical Ranking Assigned
Below Average / 3	9
Below Average / 2	8
Below Average / 1	7
Average / 3	6
Average / 2	5
Average / 1	4
Above Average / 3	3
Above Average / 2	2
Above Average / 1	1

I applied a numeric ranking system to the RRA rankings with "Above Average/1" assigned the highest ranking ("1") and "Below Average/3" assigned the lowest ranking ("9"). As shown on Exhibit AEB-10, the Arizona jurisdictional ranking ("Below Average/3" - "9.0") was significantly below the proxy group average ranking ("Average/1 – Average/2" - "4.54") from RRA. In fact, Arizona is the only jurisdiction of the 53 jurisdictions that are ranked by RRA to receive RRA's lowest rankings of "Below Average/3".

Q. How did you conduct your analysis of the S&P's assessment of credit supportiveness?

A. For credit supportiveness, S&P classifies each regulatory jurisdiction into five categories that range from "Credit Supportive" to "Most Credit Supportive." My analysis of the credit supportiveness of the regulatory jurisdictions that the proxy companies operate in, as compared with the Company's regulatory jurisdiction, was similar to the analysis of the RRA overall regulatory ranking discussed above. I assigned a numerical ranking to each category, from Most Credit Supportive ("1") to Credit Supportive ("5"). As shown in Exhibit AEB-11, similar to the RRA regulatory rankings discussed above, the Arizona jurisdictional classification of "More Credit Supportive" ("4") was below the proxy group average ranking of 2.45, which would be classified between "Highly Credit Supportive" and "Very Credit Supportive".

Q. Has RRA provided recent commentary regarding its regulatory ranking for the Arizona?

A. Yes, they have. In fact, in December 2021, RRA downgraded the regulatory environment ranking for Arizona for the third time in 2021 from Below Average/2 to Below Average/3 and noted the following:

> Regulatory Research Associates, a group within S&P Global Market Intelligence, views the Arizona regulatory environment as restrictive from an investor point of view. While recent rate case decisions rendered by the ACC had specified below average returns, a more recent decision for Arizona Public Service Co., or APS, accorded the company an equity return that is among the lowest returns observed by RRA for a vertically integrated utility in the last 30 years. The decision for APS, the state's largest electric utility, reflected a 20-basis-point penalty related to customer education programs pertaining to rate design changes implemented by the utility in 2017. In addition, the ACC imposed substantial disallowances associated with several of the utility's

generation assets. More generally, regulatory lag associated with protracted rate cases and the commission's reliance on historical test years remains a pervasive problem for the Arizona utilities, rendering it difficult for the utilities to earn their authorized returns. The general policies of the commission, which is comprised of elected officials, continue to be highly politicized, contributing to a heightened degree of risk for the state's utilities. There also continues to be a relatively high rate of turnover in the ACC's leadership, with a majority of the current commissioners seated for fewer than three years, further increasing uncertainty as the regulators get up to speed on complex issues. The commission's status as a constitutionally created entity had allowed it to operate with a degree of autonomy relative to the legislature. However, this standing was upended in 2020 when the state supreme court ruled that the authority of the legislature can supersede that of the ACC in non-ratemaking matters, adding a degree of uncertainty as Arizona addresses energy transition and regulatory reform issues. In addition, legislation enacted earlier this year governing the appeals process for commission decisions introduced an additional layer of uncertainty. More constructive elements of ACC regulation include the recognition of certain post-test-period adjustments in rate cases, the allowance of a premium rate of return on fair-value rate base, the adoption of decoupling mechanisms for both the electric and gas utilities, the use of riders for recovery of certain expenses and investments between rate cases, and the adoption of innovative rate designs. RRA accords the Arizona regulatory environment a Below Average/3 rating, a ranking that is representative of the prevailing restrictive nature of the state's regulatory climate from an investor perspective. Notably, Arizona's current ranking is the product of two recent downgrades that are indicative of the negative aspects of the resolution of APS' recent rate case, as discussed above.[73]

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

A. As discussed throughout this section of my testimony, both Moody's and S&P have identified the supportiveness of the regulatory environment as an important consideration in developing their overall credit ratings for regulated utilities. Considering the regulatory adjustment mechanisms, many of the companies in the proxy group have more timely cost

[73] Regulatory Research Associates, Profile of Arizona Corporation Commission, accessed October 27, 2022.

recovery through forecasted test years, year-end rate base, cost recovery trackers and revenue stabilization mechanisms than UNS Electric as in Arizona. Additionally, recently authorized ROEs in Arizona have been well below the average authorized ROEs for vertically integrated electric utilities across the U.S. Moreover, RRA has downgraded the RRA jurisdictional ranking for Arizona three times in 2021 and as a result Arizona is currently assigned the lowest jurisdictional ranking afforded by RRA implying greater risk than the average for the proxy group. For these reasons, I conclude that UNS Electric has greater than average regulatory risk when compared to the proxy group, indicating that the authorized ROE for UNS Electric should be higher than the proxy group median.

C. Small Size Risk

Q. Please explain the risk associated with small size.

A. Both the financial and academic communities have long accepted the proposition that the Cost of Equity for small firms is subject to a "size effect". While empirical evidence of the size effect often is based on studies of industries other than regulated utilities, utility analysts also have noted the risk associated with small market capitalizations. Specifically, an analyst for Kroll (formerly Duff and Phelps) noted:

> For small utilities, investors fact additional obstacles, such as a smaller customer base, limited financial resources, and a lack of diversification across customers, energy sources and geography. These obstacles imply a higher investor return.[74]

[74] Michael Annin, *Equity and the Small-Stock Effect*, Public Utilities Fortnightly, October 15, 1995.

Q. How does the smaller size of a utility affect its business risk?

A. In general, smaller companies are less able to withstand adverse events that affect their revenues and expenses. The impact of weather variability, the loss of large customers to bypass opportunities, or the destruction of demand as a result of general macroeconomic conditions or fuel price volatility will have a proportionately greater impact on the earnings and cash flow volatility of smaller utilities. Similarly, capital expenditures for non-revenue producing investments, such as system maintenance and replacements, will put proportionately greater pressure on customer costs, potentially leading to customer attrition or demand reduction. Taken together, these risks affect the return required by investors for smaller companies.

Q. Have the rating agencies noted size as a risk factor for UNS?

A. Yes. In their recent analysis, Moody's Investor Service noted that the Company's small size was a credit challenge. [75]

Q. How does UNS Electric's electric utility operations compare in size to the proxy group companies?

A. UNS Electric's electric utility operations are substantially smaller than the median for the proxy group companies in terms of market capitalization. Exhibit AEB-12 provides the actual market capitalization for the proxy group companies and estimates the implied market capitalization for UNS Electric (*i.e.*, the implied market capitalization if UNS

75. Moody's Investors Service Credit Opinion, April 12, 2022 at 1.

Electric's electric utility operations were a stand-alone publicly-traded entity). To estimate the size of the Company's market capitalization relative to the proxy group, I used the Company's proposed capital structure equity component of $214.61 million. I then applied the median market-to-book ratio for the proxy group of 2.04 to UNS Electric's implied common equity balance and arrived at an implied market capitalization of approximately $437.44 million or 2.82 percent of the median market capitalization for the proxy group.

Q. How did you estimate the size premium for UNS Electric?

A. Given this relative size information, it is possible to estimate the impact of size on the ROE for UNS Electric using Kroll data that estimates the stock risk premia based on the size of a company's market capitalization. As shown in Exhibit AEB-12, the median market capitalization of the proxy group of approximately $15.54 billion corresponds to the third decile of the Kroll market capitalization data. Based on Kroll's analysis, that decile corresponds to a size premium of 0.55 percent (*i.e.*, 55 basis points). UNS Electric's implied market capitalization of approximately $437.44 million falls within the ninth decile, which corresponds to a size premium of 2.10 percent (*i.e.*, 210 basis points). The difference between those size premia is 155 basis points (210 basis points minus 55 basis points).

Q. Have you considered the smaller size of UNS Electric in your recommended ROE?

A. While I have estimated the small size effect, I am not proposing a specific adjustment for this factor. Rather, I have considered the small size of UNS Electric in my assessment of

business risks in order to determine where, within a reasonable range of returns, UNS Electric's required ROE falls.

IX. CAPITAL STRUCTURE

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

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

Q. What is UNS Electric's proposed capital structure?

A. As described in the Direct Testimony of Company witness Martha B. Pritz, the Company's proposed capital structure consists of 53.72 percent common equity and 46.28 percent long-term debt.

Q. Did you conduct any analysis to determine if this projected equity ratio was reasonable?

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

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

A. I calculated the mean proportions of common equity and long-term debt for the most recent eight quarters[76] for each of the companies in the proxy group at the operating subsidiary level. My analysis of the capital structures of the proxy group companies is provided in Exhibit AEB-13. As shown in Exhibit AEB-13, the equity ratios for the proxy group ranged from 46.21 percent to 60.72 percent, with an average of 52.96 percent. UNS Electric's proposed equity ratio of 53.72 percent is well within the range established by the equity ratios for the utility operating subsidiaries of the proxy group and is therefore reasonable.

Q. Are there other factors to be considered in setting the Company's capital structure?

A. The credit rating agencies' response to the Tax Cuts and Jobs Act of 2017 ("TCJA") must also be considered when determining the equity ratio. All three rating agencies have noted

[76] The source data for this analysis is the operating company data provided in FERC Form 1 reports. Due to the timing of those filings, my average capital structure analysis uses the quarterly capital structures reported for the proxy group companies for the period from third quarter of 2020 through the second quarter of 2022.

that the TCJA has negative implications for utility cash flows. S&P and Fitch specifically identified increasing the equity ratio as one approach to ensure that utilities have sufficient cash flows following the federal income tax rate reductions and the loss of bonus depreciation. As S&P noted "[r]egulators must also recognize that tax reform is a strain on utility credit quality, and we expect companies to request stronger capital structures and other means to offset some of the negative impact".[77] Furthermore, Moody's downgraded the rating outlook for the entire utilities sector in June 2018 and has downgraded the ratings of a number of utilities based in part on the negative effects of the TCJA on cash flows.

S&P continues to maintain a negative outlook for the utility industry in 2022 and noted that since downgrades outpaced upgrades for a second consecutive year in 2021, for the first time ever the median investor-owned utility credit rating fell to the "BBB" category.[78] Further, S&P expects continued pressure on cash flows over the near-term as utilities continue to increase leverage to fund capital expenditure plans necessary to reduce greenhouse gas emission and improve safety and reliability. Finally, S&P also highlighted inflation, higher interest rates and rising commodity prices as additional risks that could further constrain the credit metrics for utilities over the near-term. In regard to inflation S&P noted:

> Inflation recently spiked to its highest level in decades after rising for several consecutive months in 2021. Given the sustained increase to the U.S. consumer price index in 2021, inflation no longer appears to be just transitory and may

[77] Standard & Poor's Ratings, "U.S. Tax Reform: For Utilities' Credit Quality, Challenges Abound", January 24, 2018, at 5.

[78] S&P Global Ratings, "For The First Time Ever, The Median Investor-Owned Utility Ratings Falls To The 'BBB' Category," January 20, 2022.

> have financial implications for the investor-owned North American regulated utility industry. Because of the regulatory lag within the industry, inflation, which causes prices to rise, typically leads to a weakening of financial performance. The regulatory lag is the timing difference between when costs are incurred and when regulators allow those costs to be fully recovered from ratepayers.[79]

The credit ratings agencies' continued concerns over the negative effects or the TCJA, inflation, and increased capital expenditures underscores the importance of maintaining adequate cash flow metrics for the industry, as a whole, and UNS Electric, particularly, in the context of this proceeding. In April 2022, Moody's noted that "UNS Electric's ratio of CFO pre-W/C to debt was 22.3%, lower than historical levels that had been in the high 20% range. The weaker credit measures were caused by the impact of tax reform on cash flow and regulatory lag in capital investment recovery".[80] Moody's concluded that "The outcome of the utility's next rate case to be filed later this year will be important in determining the strength of these credit metrics".[81]

Q. Will the capital structure and ROE authorized in these proceedings affect the Company's access to capital at reasonable rates?

A. Yes. The level of earnings authorized by the Commission directly affects the Company's ability to fund their operations with internally generated funds. Both bond investors and

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79 *Ibid.*

80 Moody's Investor Service, Credit Opinion, UNS Electric, Inc, Update to credit analysis, April 12, 2022 at 4.

81 *Ibid.*

rating agencies expect a significant portion of ongoing capital investments to be financed with internally generated funds.

It also is important to realize that because a utility's investment horizon is very long, investors require the assurance of a sufficiently high return to satisfy the long-run financing requirements of the assets placed into service. Those assurances, which often are measured by the relationship between internally generated cash flows and debt (or interest expense), depend quite heavily on the capital structure. As a consequence, both the ROE and capital structure are very important to debt and equity investors. Furthermore, considering the capital market conditions discussed in Section V, the authorized ROE and capital structure take on even greater significance.

Q. What is your conclusion regarding an appropriate equity ratio for UNS Electric?

A. Considering the actual capital structures of the proxy group operating companies, I believe that UNS Electric's proposed common equity ratio of 53.72 percent is reasonable. The proposed equity ratio is well within the range of equity ratios established by the capital structures of the utility operating subsidiaries of the proxy companies. In addition, based on the cash flow concerns raised by credit rating agencies as a result of the TCJA, inflation, and increased capital expenditures, it is reasonable to rely on a higher equity ratio than the Company may have relied on in prior rate cases.

X. CONCLUSION AND RECOMMENDATION ON ROE AND CAPITAL STRUCTURE

Q. What is your conclusion regarding a fair ROE for UNS Electric?

A. Figure 17 below provides a summary of my analytical results for the proxy group. Based on these results, the qualitative analyses presented in my Direct Testimony, the business and financial risks of UNS Electric compared to the proxy group, and current conditions in capital markets including the expectation for rising interest rates and increase in inflationary pressure, it is my view that an ROE of 10.25 percent is reasonable and would fairly balance the interests of customers and shareholders. This ROE would enable the Company to attract capital at reasonable rates under a variety of economic and financial market conditions, while continuing to provide safe, reliable, and affordable electric utility service to customers in Arizona.

Figure 16: Summary of Analytical Results

	Constant Growth DCF		
	Mean Low	Mean	Mean High
30-Day Average	8.42%	9.45%	10.49%
90-Day Average	8.15%	9.18%	10.23%
180-Day Average	8.13%	9.16%	10.21%
	Median Low	Median	Median High
30-Day Average	8.10%	9.62%	10.43%
90-Day Average	7.81%	9.37%	10.02%
180-Day Average	7.88%	9.35%	9.95%
	CAPM		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.67%	11.68%	11.65%
Bloomberg Beta	11.16%	11.19%	11.15%
Long-Term Avg. Beta	10.50%	10.52%	10.47%
	ECAPM		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.94%	11.95%	11.93%
Bloomberg Beta	11.56%	11.58%	11.55%
Long-Term Avg. Beta	11.06%	11.08%	11.04%
	Risk Premium		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium Results	10.32%	10.36%	10.27%
Size Premium		1.55%	

Q. What is your conclusion regarding the Company's proposed common equity ratio?

A. I conclude that UNS Electric's proposed rate-making capital structure composed of 53.72 percent common equity, and 46.28 percent long-term debt is reasonable when compared to the capital structures of the companies in the proxy group and taking in consideration the effect of the TCJA, and increased capital expenditures on cash flows and therefore should be adopted.

XI. FAIR VALUE RATE BASE

Q. What is the fair value standard in Arizona?

A. As the Commission noted in its decision regarding *Chaparral City Water Company*,[82] the Arizona Constitution requires the use of a fair value rate base in establishing rates. Article XV, Section 14 of the Arizona Constitution states:

> The corporation commission shall, to aid it in the proper discharge of its duties, ascertain the fair value of the property within the state of every public service corporation doing business therein; and every public service corporation doing business within the state shall furnish to the commission all evidence in its possession, and all assistance in its power, requested by the commission in aid of the determination of the value of the property within the state of such public service corporation.[83]

As interpreted by the Arizona Court of Appeals, this paragraph requires the Commission to find the fair value of a public service corporation's property and to use that value to set just and reasonable rates.[84]

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82 Decision No. 70441 (July 28, 2008), at 20-21.

83 Arizona Constitution, Article XV, Section 14.

84 Decision No. 75697 (August 18, 2016), Decision No. 71914, (September 30, 2010) at 48-49. See also, Decision No. 70441 (July 28, 2008), at 20-21.

Q. How has the Commission applied the Fair Value Standard in prior cases?

A. The fair value standard, as applied by the Commission in recent rate cases, includes the estimation of two components: (1) the FVRB; and (2) the FVROR on the FVRB.[85]

Q. How has the Commission estimated the FVRB?

A. In several recent cases, the Commission has determined that it was appropriate to estimate the FVRB by equally weighting the OCRB and the RCND. The RCND estimates the current replacement cost value of the utility system by escalating the utility's original investments in rate base assets by inflation, since the installation year of the asset. In order to recognize physical and functional depreciation of the assets, the replacement cost is then adjusted for the accounting depreciation of the assets based on the expected useful life of the asset, as determined through the company's depreciation study.

XII. FAIR VALUE RATE OF RETURN

Q. Does the fair value standard also require consideration of the fair return on the fair value of the Company's assets?

A. Yes. As noted above, the Arizona Constitution requires that the Commission establish just and reasonable rates using the fair value of the Company's property. In establishing the revenue requirement, the Commission would also need to establish the appropriate ROE to apply to the equity component of the FVRB.

85. Decision No. 75697 (August 18, 2016), Decision No. 71914 (September 30, 2010), at 51.

Q. How has the Commission estimated the FVROR on the FVRB?

A. In several recent cases, the Commission has determined the FVROR by applying the market ROE and the cost of debt to the Company's OCRB based on the percent of equity and debt in the Company's proposed capital structure. The Commission then applies a different rate, traditionally one half of the risk-free rate, to what has been commonly referred to as the "fair value increment."[86] The fair value increment is the difference between the OCRB and the Company's proposed FVRB. The FVROR is then the sum of the returns on each of the three components: (1) equity capital; (2) debt capital; and (3) the fair value increment, weighted by the percentage of each in the FVRB.

Q. What does the fair value increment represent?

A. As described in the Commission's Decision No. 77850, the fair value increment represents the appreciation in the value of the assets to their current value due to inflation. The sum of the OCRB and the fair value increment is the total fair value of the utility's property.[87]

Q. What rate of return should be applied to the fair value increment?

A. Based on the risk differential between equity and debt investments, equity holders will require a greater return than the risk-free rate. As such, the range of returns on the fair value increment should be between the risk-free rate and the Cost of Equity established by the results of the proxy group analysis.

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[86] Decision No. 77856 (December 31, 2020), at 69-70, Decision No. 77850 (December 17, 2020), at 74, Decision No. 70665 (December 24, 2008), at 32 and Decision No. 75697 (August 18, 2016), at 14.

[87] *Ibid.*

Q. Do you agree with the Commission's decision in TEP's last rate case to reduce the authorized ROE because the return on the FVI decreases the risk of the Company?

A. No, I do not for two reasons. First, the Commission considered the effect of the return on the FVI in isolation and did not consider other factors that affect the business and financial risk of TEP nor did the Commission consider how the return on the FVI increment affected the risk of the Company as compared to the proxy group. Second, the Commission reduced the authorized ROE for TEP by 20 basis points to account for the reduction in risk associated with the return on the FVI;[88] however, this results in a FVROR that was less than if the Commission did not reduce the ROE and awarded a zero percent return on the FVI. Thus, the FVI offset actually results in a negative effect of the fair value consideration required by the Arizona Constitution, even though the fair value rate base is considerably higher than the original cost rate base. The combination of the reduction in the ROE and the return on the FVI increment reduces the FVROR which negated the intent of the Fair Value clause of the Arizona Constitution.

Q. Please explain why it was not appropriate to measure the risk of TEP based only on one factor, the return on the FVI.

A. The return on equity for TEP in Docket No. E-01933A-19-0028 was determined by the Commission based on the ROE results presented by the parties in the case which in turn were developed considering the market return on a proxy group of risk comparable

88. Decision No. 77856 (December 31, 2020), at 70.

companies and which met the tenets of *Hope* and *Bluefield*. As discussed in Section VIII above, in addition to reviewing the results of the traditional ROE estimation models for that comparable group, it would be important to consider what type of risk-mitigating mechanisms had been implemented by the proxy group to determine whether or not the market data for the proxy companies reflects similar risk mitigation as the mechanisms that are available to TEP. The Commission reduced the ROE for TEP based solely on the fact that the Company is allowed a return on the FVI, the Commission did not consider the comparability of the companies in sample groups relied on by the parties, nor the risk-mitigation that may be implemented at those companies. Absent this comparison, there is no basis to conclude that TEP has less risk. Moreover, the results no longer comported with the requirements of *Hope* and *Bluefield*.

Q. Please explain how the Commission's downward adjustment to the ROE for TEP in its last rate case resulted in a reduction in the FVROR.

A. As shown in Figure 18, I calculated the FVROR authorized for TEP in Docket No. E-01933A-19-0028 which reflected a 20-basis point reduction in the ROE and a return on the FVI of 0.20 percent. This results in a FVROR of 4.98 percent.[89] Similarly, as shown in Figure 19, I calculated an adjusted FVROR for TEP removing the 20-basis point reduction in the ROE and assumes a zero percent return on the FVI. This results in an adjusted FVROR of 5.00 percent which is 2 basis points greater than the FVROR authorized for TEP. Therefore, the Commission's downward ROE adjustment resulted in a decrease in

[89] Decision No. 77856 (December 31, 2020), at 70.

the FVROR for TEP. Effectively, the Commission's fair value approach negatively valued the fair value of TEP's plant, even though the fair value rate base was significantly higher than the original cost rate base.

As discussed above, it is my understanding that the Arizona Constitution requires the Commission to consider fair value in setting rates and it has done so by allowing a utility to earn a return on the FVI of rate base. While the Commission approved a return on the FVI increment of 0.20 percent, the reduction in the ROE more than offsets the return on the FVI resulting in a reduced FVROR.

Figure 17: Authorized FVROR for TEP in Docket No. E-01933A-19-0028

Capital	$ Millions	Percent	Cost Rate	Weighted Cost Rate
Long-Term Debt	$1,268.57	32.83%	4.65%	1.53%
Common Equity	$1,435.11	37.14%	9.15%	3.40%
Fair Value Increment	$1,160.45	30.03%	0.20%	0.06%
Total	$3,864.13			4.98%

Figure 18: Adjusted FVROR

Capital	$ Millions	Percent	Cost Rate	Weighted Cost Rate
Long-Term Debt	$1,268.57	32.83%	4.65%	1.53%
Common Equity	$1,435.11	37.14%	9.35%	3.47%
Fair Value Increment	$1,160.45	30.03%	0.00%	0.00%
Total	$3,864.13			5.00%

Q. Do you believe a downward adjustment to the ROE is warranted in the current proceeding to account for the reduction in UNS Electric's risk associated with the return on the FVI?

A. No, I do not. As I have discussed in great detail in Section VIII above, I believe the Company has greater business and financial risk relative to the proxy group. This is due to a) the regulatory risk that the Company faces operating in Arizona as opposed to the jurisdictions in which the companies in the proxy group operate; b) the Company's significant capital expenditures plan of which only a limited amount can be recovered on a timely basis through UNS Electric's capital tracking mechanism; and c) the Company's plans for reshaping its generation portfolio which will require continued access to capital markets to finance the new investments. These increased risk factors more than offset any reduction in risk for the Company associated with the return on the FVI. As a result, I do not believe it is appropriate to adjust the ROE downwards because the Company is allowed a return on the FVI.

Q. Do you agree with the methodology of determining the rate of return to be applied to the fair value increment traditionally used by the Commission, *i.e.*, half of the risk-free interest rate?

A. No. There is no basis whatsoever for reducing this return component to one-half of the risk-free rate. Since equity investors are the residual claimants after bondholders and preferred stockholders, it is inconceivable to me that an investor would accept a rate of return that is less than the cost of debt for an equity position in any investment. At the very

least, the market expectation is that investments that are not risk-free should earn a rate of return that exceeds the risk-free rate. Furthermore, the application of 50.00 percent of the risk-free rate as a measure of the Cost of Equity on the fair value increment is subjective and has no basis in financial theory. The risk-free rate sets the low-end of the range of returns that I believe would be appropriate to apply to the fair value increment.

Q. Have you estimated the FVROR in this case?

A. I have estimated the FVROR using three approaches, all based generally on the methodology that has been relied on by the Commission in prior cases.

Q. Please explain the methodologies you used to estimate the risk-free rate of return?

A. As shown in Exhibit AEB-14, in all three cases, the risk-free rate is estimated based on a nominal projection of the risk-free rate and an interest rate assumption to establish the real risk-free rate. In the first two scenarios, I relied on a projected nominal risk-free rate of return as the average of the 2024-2028 projected yield on 30-year U.S. Treasury bonds of 3.80 percent and the 2029-2033 projected yield on 30-year U.S. Treasury bonds of 3.90 percent as reported in the Blue Chip Financial Forecasts.[90] I then adjusted the nominal risk-free rate of 3.85 percent by a measure of inflation.

In scenario 1, the nominal risk-free rate was adjusted based on a projected estimate of inflation that was based on the growth in the Consumer Price Index and the GDP Chain-

[90] Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022 at 14.

type Price Index over the period from 2032-2050 (see Exhibit AEB-14). The rate of inflation of 2.32 percent is based on three measures: (1) the average 2024-2028 and 2029-2033 projected growth rate in the CPI of 2.35 percent, as reported by Blue Chip Financial Forecasts;[91] (2) the compound annual growth rate of the CPI for all urban consumers for 2032-2050 of 2.35 percent as projected by the EIA in the Annual Energy Outlook 2022; and (3) the compound annual growth rate of the GDP Chain-Type Price Index for 2032-2050 of 2.26 percent, also reported by the EIA in the Annual Energy Outlook 2022.[92] Using these indexes, the estimate of inflation was 2.32 percent. Removing inflation from the nominal risk-free rate resulted in a real risk-free rate of 1.50 percent.

In scenario 2, the estimate of inflation was based on the 180-day average yield on the 30-year U.S. Treasury Bond (i.e., 2.89 percent) minus the 180-day average yield on the 30-year U.S. Treasury Inflation Protected Security (TIPS) (i.e., 0.54 percent). This resulted in an estimate of inflation of 2.35 percent. The resulting real risk-free rate after adjusting for inflation is 1.50 percent.

Q. Did you consider other estimates of the risk-free rate?

A. Yes, I also considered a normalized estimate of the risk-free rate. As discussed previously in my Direct Testimony, though recent data has demonstrated historically low interest rates, investors are expecting to see increases in interest rates over time. In order to address

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91 *Ibid.*

92 U.S. Energy Information Administration, Annual Energy Outlook 2022, Table 20, Macroeconomic Indicators.

the uncertainty on the correct level of interest rates, in scenario 3, I have relied on a normalized risk-free rate, as published by Kroll of 3.50 percent. This normalized interest rate is then converted to a real rate using the difference between the yield on the 30-year U.S. Treasury Bond and the yield on the TIPS of 2.35 percent. The resulting real risk-free rate is 1.15 percent.

Q. What is your conclusion on the appropriate real risk-free rate in this case?

A. The range established by the three methodologies that I developed is from 1.15 percent to 1.50 percent. In reviewing the inflation estimates, I believe that the inflation estimate developed in Scenario 3, which relies on the normalized risk-free rate from Kroll may understate the expected risk-free rate over the near-term given, as discussed in Section V above, investors expect interest rates to increase as the Federal Reserve normalizes monetary policy in response to inflation. Averaging the results from all three scenarios, even though Scenario 3 may understate the expected rate, results in a real risk-free rate of 1.38 percent. UNS Electric is requesting a real risk-free rate of 0.69 percent be relied on for the FVI cost rate. Therefore, I conclude that the Company's estimate of the real risk-free rate to be used as the FVROR is conservative considering my estimates of the real risk-free rate.