BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

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IN THE MATTER OF ADVICE NO. 1029-GAS OF PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 6-GAS TARIFF TO INCREASE JURISDICTIONAL BASE RATE REVENUES, IMPLEMENT NEW BASE RATES FOR ALL GAS RATE SCHEDULES, AND MAKE OTHER PROPOSED TARIFF CHANGES EFFECTIVE FEBRUARY 29, 2024	)	**PROCEEDING NO. 24AL-____G**

DIRECT TESTIMONY AND ATTACHMENTS OF ANN E. BULKLEY

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

January 29, 2024

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I. INTRODUCTION AND OVERVIEW

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

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

A. I am submitting this Direct Testimony before the Colorado Public Utilities Commission ("Commission") on behalf of Public Service Company of Colorado ("Public Service" or the "Company"), a Colorado corporation and wholly-owned subsidiary of Xcel Energy Inc. ("Xcel Energy"). Xcel Energy is a registered holding company that owns several electric, natural gas, and steam utility operating

companies, a regulated natural gas pipeline company, and three transmission service companies.[1]

Q. PLEASE DESCRIBE YOUR BACKGROUND AND PROFESSIONAL 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 over 25 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. My resume and a summary of testimony that I have filed in other proceedings are included as Attachment AEB-1.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my Direct Testimony is to present evidence and provide an opinion regarding the reasonable range for setting Public Service's authorized return on equity ("ROE") for its natural gas distribution business. I also provide an assessment of the reasonableness of the proposed capital structure to be used for

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

ratemaking purposes that is discussed in the testimony of Company witness Mr. Paul A. Johnson.

Q. ARE YOU SPONSORING ANY EXHIBITS OR SCHEDULES IN SUPPORT OF YOUR DIRECT TESTIMONY?

A. Yes. My analyses and conclusions are supported by the data presented in Attachments AEB-2 through AEB-12.

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE ANALYSES THAT LED TO YOUR CONCLUSION REGARDING THE COMPANY'S PROPOSED ROE.

A. In developing my opinion, I have estimated the cost of equity required by investors to invest in the Company by applying traditional estimation methodologies to a proxy group of comparable utilities, which include 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 a Bond Yield Risk Premium ("BYRP" or "Risk Premium") analysis. I also consider the Company's relative business and regulatory risk as compared with the proxy group; and the Company's proposed capital structure as compared with the capital structures of the operating utilities of the proxy group companies. While I do not make specific adjustments to the cost of equity for these factors in developing my opinion regarding the reasonableness of the Company's proposed ROE, I do consider them in the aggregate.

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

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

- Section II provides a summary of my analyses and conclusions.

- Section III reviews the regulatory guidelines pertinent to the development of the cost of capital.
- Section IV discusses current and prospective capital market conditions and the effect of those conditions on Public Service's cost of equity.
- Section V explains my selection of a proxy group.
- Section VI describes my analyses and the basis for my opinion regarding the appropriate ROE for Public Service.
- Section VII 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 proceeding.
- Section VIII provides an assessment of the reasonableness of Public Service's proposed capital structure.
- Section IX presents my conclusions and recommendations.

II. SUMMARY OF ANALYSES AND CONCLUSIONS

Q. PLEASE SUMMARIZE THE KEY FACTORS YOU CONSIDER IN YOUR ANALYSES AND UPON WHICH YOU BASE YOUR OPINION REGARDING THE REASONABLENESS OF THE COMPANY'S PROPOSED ROE.

A. My analyses and conclusions consider the following:

- The United States ("U.S.") Supreme Court's *Hope* and *Bluefield* decisions,[2] which established the standards for determining a fair and reasonable authorized ROE for public utilities, including consistency of the authorized return with other businesses having similar risk, adequacy of the return to ensure access to capital and support credit quality, and the necessity for the end result to lead to just and reasonable rates.

- The effect of current and prospective capital market conditions on the cost of equity estimation models and on investors' return requirements.

- The results of several analytical approaches that provide estimates of the Company's cost of equity. Because the Company's authorized ROE should be a forward-looking estimate over the period during which the rates will be in effect, these analyses rely on forward-looking inputs and assumptions (*e.g.*, projected analyst growth rates in the DCF model; forecasted risk-free rate and market risk premium in the CAPM analysis).

- Although the companies in my proxy group are generally comparable to Public Service, each company is unique, and no two companies have the exact same business and financial risk profiles. In particular, natural gas distribution companies in Colorado and in certain other jurisdictions face specific business risks relative to an energy landscape transitioning from the use of fossil fuels and the requirements to reduce greenhouse gas ("GHG") emissions. Accordingly, I consider the Company's regulatory, business, and financial risks relative to the proxy group of comparable companies in assessing where within the range of analytical results the

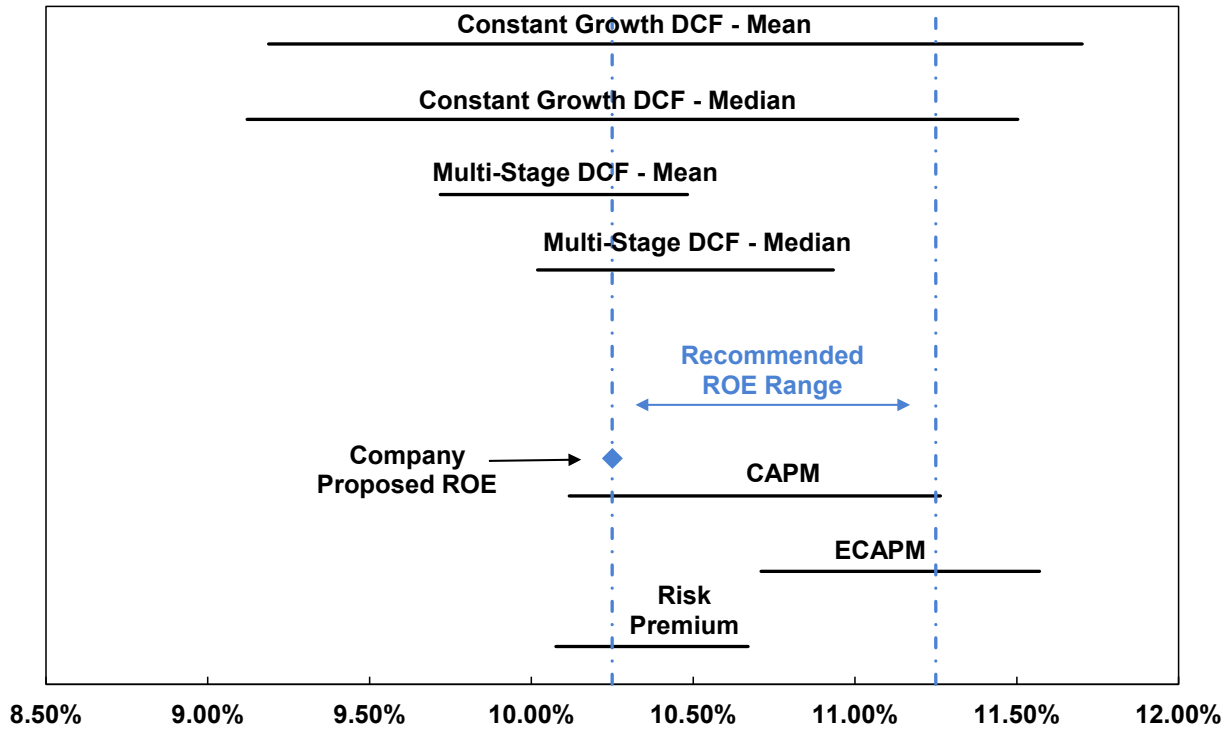
[2] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) ("*Hope*"); *Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("*Bluefield*").

Company's ROE should reasonably fall to appropriately account for any residual differences in risk.

Q. WHAT ARE THE RESULTS OF THE MODELS THAT YOU HAVE USED TO ESTIMATE THE COST OF EQUITY FOR PUBLIC SERVICE?

A. Figure AEB-D-1 summarizes the range of results of my cost of equity analyses based on a proxy group of natural gas utilities.[3]

Figure AEB-D-1:
Summary of Analytical Results



[3] As discussed herein, while the natural gas utility proxy group is the primary and most comparable proxy group, consistent with past Commission practice, I have also conducted the cost of equity analyses using a combination utility proxy group, and the range of results overlap with the natural gas utility proxy group. Unless otherwise noted, when the proxy group is referenced herein, it means the natural gas utility proxy group.

As shown, the range of results across all methodologies is wide. While it is common to consider multiple models to estimate the cost of equity, it is particularly important when the range of results varies considerably across methodologies.

Q. ARE PROSPECTIVE CAPITAL MARKET CONDITIONS EXPECTED TO AFFECT THE RESULTS OF THE COST OF EQUITY ANALYSES FOR THE COMPANY DURING THE PERIOD IN WHICH THE RATES ESTABLISHED IN THIS PROCEEDING WILL BE IN EFFECT?

A. Yes. Capital market conditions are expected to affect the results of the cost of equity estimation models. Specifically:

- Long-term interest rates have increased substantially over the past two years and are expected to remain relatively high at least over the next year in response to inflation.
- Since (i) utility dividend yields are less attractive than the risk-free rates of government bonds; (ii) interest rates are expected to remain near current levels over the next year, and (iii) utility stock prices are inversely related to changes in interest rates; utility share prices may remain depressed.
- Rating agencies have responded to the risks of the utility sector, citing factors including elevated capital expenditures, interest rates, and inflation that create pressures for customer affordability and prompt rate recovery, and have noted the importance of regulatory support in their current outlooks.
- Similarly, equity analysts have noted the increased risk for the utility sector as a result of elevated interest rates and expect the sector to underperform in 2024.
- Consequently, it is important to consider that if utility share prices decline, the results of the DCF model, which relies on current utility share prices, would understate the cost of equity during the period that the Company's rates will be in effect.

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

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

A. Based on the analytical results of the cost of equity models, and current and prospective capital market conditions, I conclude that an ROE in the range of 10.25 percent to 11.25 percent is reasonable.

Q. THE COMPANY HAS INCLUDED AN ROE OF 10.25 PERCENT IN ITS REQUESTED WEIGHTED AVERAGE COST OF CAPITAL. IN YOUR OPINION, IS THIS REASONABLE?

A. Yes. Taking into consideration the Company's regulatory, business, and financial risk relative to the proxy group, I would recommend an ROE that is above the midpoint of that range, however, despite the increase in the cost of equity since the Company's last rate proceeding, the Company is proposing to maintain its request at 10.25 percent, which is conservative at the bottom end of the range of the market cost of equity results. Company witness Mr. Steven P. Berman explains the reason for this approach.

Q. IS THE COMPANY'S REQUESTED CAPITAL STRUCTURE REASONABLE?

A. Yes. The Company's proposed equity ratio of 55 percent is well within the range of the actual capital structures of the utility operating subsidiaries of the proxy group companies. Further, the Company's proposed equity ratio is reasonable considering that credit rating agencies have identified in their outlook for the utility

sector significant risks such as relatively high interest rates and inflation, record levels of capital spending, and the need to fund capital spending in a credit supportive manner.

III. REGULATORY GUIDELINES

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

A. The U.S. Supreme Court's precedent-setting *Hope* and *Bluefield* cases established the standards for determining the fairness or reasonableness of a utility's authorized ROE. Among the standards established by the Court in those cases are: (1) consistency with other businesses having similar or comparable risks; (2) adequacy of the return to support credit quality and access to capital; and (3) the principle that the specific means of arriving at a fair return are not important, only that the end result (*i.e.*, an ROE that reflects investors' requirements for investments of comparable risks and supports a utility's credit quality and access to capital) leads to just and reasonable rates.[4]

Q. HAS THE COMMISSION PROVIDED SIMILAR GUIDANCE IN ESTABLISHING THE APPROPRIATE ROE?

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

> To be consistent with sound regulatory economics and the standards set forth by the Supreme Court in the *Bluefield* and *Hope* cases, a utility's allowed ROE should be: (i) similar to that of other financially sound businesses having similar or comparable risk, (ii) sufficient to ensure confidence in the financial integrity of the utility, and (iii) adequate to maintain and support the credit of the utility, thereby enabling it to attract, on a reasonable cost basis, the funds necessary

[4] *Bluefield*, 262 U.S. at 692-93; *Hope*, 320 U.S. at 603.

to satisfy its capital requirements so that it can meet the obligation to provide adequate and reliable service to the public.[5]

Q. WHY IS IT IMPORTANT FOR A UTILITY TO BE ALLOWED THE OPPORTUNITY TO EARN A RETURN 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 natural gas service while maintaining its financial integrity. That return should be commensurate with returns expected elsewhere in the market for investments of equivalent risk. If it is not, debt and equity investors will seek alternative investment opportunities for which the expected return reflects the perceived risks, thereby inhibiting the Company's ability to attract capital at reasonable cost.

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

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

[5] Proceeding Nos. 11AL-382E and 11AL-387E, Decision No. C11-1373, at ¶ 87.

authorized ROE significantly below authorized ROEs for other utilities can inhibit the utility's ability to attract capital for investment.

Q. WHAT IS THE STANDARD FOR SETTING THE ROE IN A JURISDICTION?

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

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

A. No. In this proceeding, consistent with the stand-alone ratemaking principle, it is appropriate to establish the cost of equity for Public Service to provide the ability to attract capital on reasonable terms for investment in this independent operating company. While Public Service is committed to investing the required capital to provide safe and reliable service, Public Service competes with other Xcel Energy subsidiaries for discretionary investment capital. In determining how to allocate its finite discretionary capital resources, it would be reasonable for Xcel Energy to consider the authorized ROE of each of its subsidiaries.

Q. IN YOUR EXPERIENCE, DO REGULATORY COMMISSIONS TYPICALLY ESTABLISH THE ROE AS A POINT ESTIMATE OR A RANGE AS PART OF A LITIGATED PROCEEDING?

A. In my experience, when a regulatory commission establishes an ROE for ratemaking purposes as part of a litigated proceeding, a specific ROE is authorized as opposed to a range of potential returns. It is also the case that regulatory commissions separately evaluate the appropriate capital structure to be used for ratemaking purposes and the cost of debt; specifying each of the individual components of the weighted average cost of capital.

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

A. Yes. The regulatory framework is one of the most important factors in investors' assessments of the risk of utilities. Specifically, the authorized ROE and equity ratio for regulated utilities is very important for determining the degree of regulatory support for supporting a utility's creditworthiness and financial stability in the jurisdiction. To the extent that authorized returns in a jurisdiction are lower than the returns that have been authorized more broadly, such actions are considered by both debt and equity investors in the overall risk assessment of the regulatory jurisdiction in which the company operates.

Q. ARE YOU AWARE OF ANY UTILITIES THAT HAVE EXPERIENCED A CREDIT RATING DOWNGRADE AND/OR A NEGATIVE MARKET RESPONSE RELATED TO THE FINANCIAL EFFECTS OF A RATE CASE DECISION?

A. Yes. There are numerous examples in which utilities have experienced a negative market response related to the financial effects of a rate decision, including credit rating downgrades and material stock price declines. For example, ALLETE, Inc.,[6] CenterPoint Energy Houston Electric,[7] and Pinnacle West Capital Corporation ("PNW")[8] each received credit rating downgrades following rate case decisions in the past few years for reasons that included below average authorized ROEs. The most recent example is the decision by the Illinois Commerce Commission ("ICC") in mid-December 2023 that rejected the multiyear grid plan proposals of Ameren Illinois Co. ("Ameren IL") and Commonwealth Edison Co. ("ComEd") and authorized lower-than-expected ROEs for both utilities. Specifically, the ICC authorized an ROE for Ameren IL of 8.72 percent and 8.905 percent for ComEd, which was a significant reduction from the Administrative Law Judge's recommendations of 9.24 percent and 9.28 percent, respectively.[9]

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6 Moody's Investors Service, "Credit Opinion: ALLETE, Inc. Update following downgrade," April 3, 2019, at 3.

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

8 S&P Capital IQ Pro; FitchRatings, "Fitch Downgrades Pinnacle West Capital & Arizona Public Service to 'BBB+'; Outlooks Remain Negative," October 12, 2021; and Moody's Investors Service, "Rating Actions: Moody's downgrades Pinnacle West to Baa1 and Arizona Public Service to A3; outlook negative," November 17, 2021.

9 Allison Good, "Ameren, Exelon shares fall after Illinois regulators reject grid plans," *Platts*, December 15, 2023.

Q. HOW DID THE MARKET RESPOND TO THE ICC'S DECISIONS FOR THESE UTILITIES?

A. While the S&P 500 was increasing, the share prices of the parent companies of both Ameren IL and ComEd (*i.e.*, Ameren Corp. and Exelon Corp., respectively) each dropped more than 7 percent on December 14, 2023 after the ICC's decision, and declined again by more than 4.4 percent and 6.4 percent the following day, respectively.[10] As of the close on January 5, 2023, Ameren and Exelon's stock prices were, respectively, 8.9 percent and 11.4 percent below where their stock prices closed on December 13, 2023, or the day immediately prior to the ICC's decisions.[11]

In addition, the reactions of equity analysts were universally negative, and questioned whether the parents of both Ameren IL and ComEd (*i.e.*, Ameren Corp. and Exelon Corp., respectively) will shift their capital spending out of the jurisdiction as a result of the uncertainty associated with the multiyear rate plan and low authorized ROEs. For example:

- Barclays characterized the ICC's ROE authorizations as "draconian" and "one of the lowest awarded in recent memory, especially in an elevated interest rate and cost of capital environment."[12] Barclays also stated it found it hard to believe utilities "can deploy capital under the same magnitude on the updated grid plans to be filed, especially under the current proposed ROE framework."

[10] Yahoo! Finance.

[11] Ameren Corp.'s stock price closed at $81.32 on December 13, 2023 and $74.05 on January 5, 2023. Exelon Corp.'s stock price closed at $41.00 on December 13, 2023 and $36.31 on January 5, 2023.

[12] Barclays, "AEE/EXC: Coal Stocking-Stuffer in Illinois," December 14, 2023.

- In its assessment of the impact on Exelon, the parent of ComEd, UBS stated that, "[t]he actions taken by the ICC today call into question, in our view, the regulatory backdrop in which EXC operates."[13]

- Wells Fargo stated that it was not mincing words, and that the ICC's orders were "onerous" and that:

> We now view IL as one of the worst regulatory jurisdictions in the U.S. (nipping at CT's heels). We think the totality of the recent orders suggest that the regulatory balancing act between customers and investors is currently heavily skewed toward customers. As a result, we wonder if AEE & EXC will allocate capital away from IL. Keep in mind, IL represents ~25% of both AEE's & EXC's total rate base.[14]

- In its evaluation of Ameren IL, BofA Securities characterized the ICC's decision as "punitive" and stated that it was a surprise based on numerous conversations with investors that believed the ICC may authorize an ROE above the ALJ's recommendation, not substantially lower, and that the downside surprise was one of the biggest in recent memory for their regulated utility coverage.[15] While BofA Securities acknowledged that Ameren IL represents less than 20 percent of Ameren Corp.'s consolidated rate base, it will nonetheless need offsets or capital expenditures elsewhere in order to hit its earnings growth rate targets.[16]

- After the decisions, Guggenheim questioned, "Is Illinois Becoming the Next Connecticut?" Guggenheim noted that investors questioned whether Illinois was "slowly becoming a CT-esque jurisdiction," and that equity and debt holders are going to be wary of Illinois as a jurisdiction going forward and that the ICC is "simply sending a negative message to investors."[17]

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[13] UBS, First Read Exelon Corp., "Negative Rate Case Outcome – Rating and PT Under Review," December 14, 2023.

[14] Wells Fargo, "The ICC Delivers a Lump of Coal for AEE & EXC," December 14, 2023.

[15] BofA Securities, Ameren Corporation, "Illinois delivers downside surprise," December 15, 2023.

[16] *Id*.

[17] Guggenheim, "IL: Is Illinois Becoming the Next Connecticut? To Be Determined, but Taking a Neutral Stance on the State," December 15, 2023.

Also, after the ICC's decisions, Regulatory Research Associates ("RRA") lowered its rating of the Illinois regulatory jurisdiction from Average/2 to Average/3 due to the "concerning pattern of restrictive" rate actions in the state.

Q. WHAT ARE YOUR CONCLUSIONS REGARDING REGULATORY GUIDELINES?

A. The ratemaking process is premised on the principle that, in order for investors and companies to commit the capital needed to provide safe and reliable utility services, a utility must have a reasonable opportunity to recover the return of, and the market-required return on, its invested capital. Accordingly, the Commission's order in this proceeding should establish rates that provide the Company with a reasonable opportunity to earn an ROE that is: (1) adequate to attract capital at reasonable terms; (2) sufficient to ensure its financial integrity; and (3) commensurate with returns on investments in enterprises with similar risk. As noted in *Hope* and *Bluefield*, as well as by the Commission,[18] it is important for the ROE authorized in this proceeding to satisfy all three of these criteria. Additionally, it is important that the Commission's decision also consider current and projected capital market conditions, as well as investors' expectations and requirements for both risks and returns. Because utility operations are capital-intensive, regulatory decisions should enable the utility to attract capital at reasonable terms under a variety of economic and financial market conditions. Providing the opportunity to

[18] *See, e.g.*, Proceeding Nos. 11AL-382E and 11AL-387E, Decision No. C11-1373, at ¶ 87; Proceeding No. 17AL-0363G, Decision No. C18-0736-I, at ¶ 56-57.

earn a market-based cost of capital supports the financial integrity of the Company, which is in the interest of both customers and shareholders.

IV. CAPITAL MARKET CONDITIONS

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

A. The models used to estimate the cost of equity rely on market data and thus the results of those models can be affected by prevailing market conditions at the time the analysis is performed. While the ROE established in a rate proceeding is intended to be forward-looking, the analysis uses current and projected market data, including stock prices, dividends, growth rates, and interest rates, in the cost of equity estimation models to estimate the investor-required return for the subject company.

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

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

A. The cost of equity for regulated utility companies is affected by several factors in the current and prospective capital markets, including: (1) relatively high inflation; (2) changes in monetary policy; and (3) elevated interest rates that are expected

to remain relatively high over the next few years. These factors affect the assumptions used in the cost of equity estimation models.

A. Inflation Expected to Remain Above Federal Reserve's Target Level for Near-Term

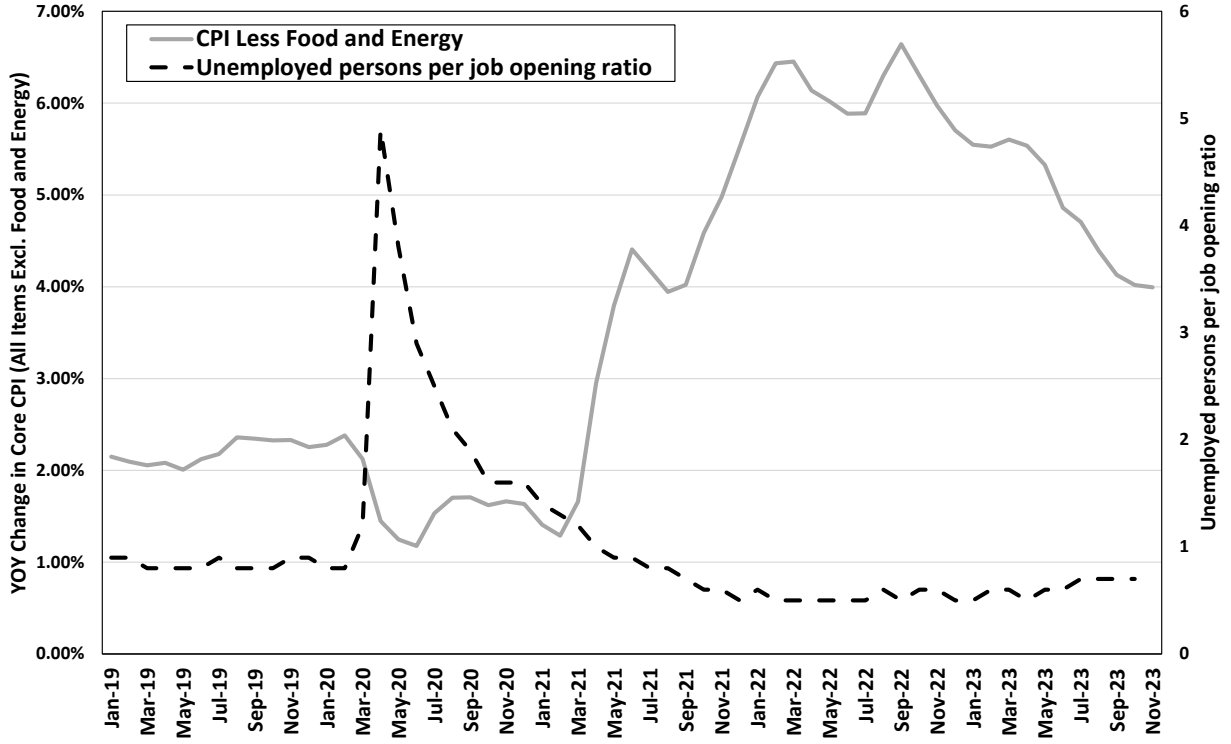
Q. WHAT HAS THE LEVEL OF INFLATION BEEN OVER THE PAST FEW YEARS?

A. As shown in Figure AEB-D-2, core inflation increased steadily beginning in early 2021, rising from 1.41 percent in January 2021 to a high of 6.64 percent in September 2022, which was the largest 12-month increase since 1982.[19] Since that time, while core inflation has declined in response to the Federal Reserve's monetary policy, it continues to remain above the Federal Reserve's target level of 2.0 percent.

In addition, as shown in Figure AEB-D-2, I also considered the ratio of unemployed persons per job opening, which is currently 0.7 and has been consistently below 1.0 since 2021, despite the Federal Reserve's accelerated policy normalization. This metric indicates sustained strength in the labor market. Given the Federal Reserve's dual mandate of maximum employment and price stability, the continued increased levels of core inflation coupled with the strength in the labor market has resulted in the Federal Reserve's sustained focus on the priority of reducing inflation.

[19] Figure AEB-D-2 presents the year-over-year ("YOY") change in core inflation, as measured by the Consumer Price Index ("CPI") excluding food and energy prices as published by the Bureau of Labor Statistics. I considered core inflation because it is the preferred inflation indicator of the Federal Reserve for determining the direction of monetary policy. Core inflation is preferred by the Federal Reserve because it removes the effect of food and energy prices, which can be highly volatile.

Figure AEB-D-2:
Core Inflation and Unemployed Persons-to-Job Openings, January 2019 to November 2023[20]



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

A. The Federal Reserve has indicated that it expects inflation will remain elevated above its target level until 2026 and that the extent to which it maintains its restrictive monetary policy will depend on market indicators going forward. For example, Federal Reserve Chair Powell at the Federal Open Market Committee ("FOMC") meeting on December 13, 2023 observed that while inflation is off of its recent highs, it remains too high and noted that further policy firming is possible based on the data:

[20] Bureau of Labor Statistics.

> Today, we decided to leave our policy interest rate unchanged and to continue to reduce our securities holdings. Given how far we have come, along with the uncertainties and risks that we face, the Committee is proceeding carefully. We will make decisions about the extent of any additional policy firming and how long policy will remain restrictive based on the totality of the incoming data, the evolving outlook, and the balance of risks.[21]

Chair Powell reiterated that the FOMC was committed to bringing inflation down to the 2 percent target level, and that while the easing of inflation has been good news, it is currently projected to take until 2026 to reach the Federal Reserve's target of 2.0 percent:

> Inflation has eased over the past year but remains above our longer-run goal of 2 percent. Based on the Consumer Price Index and other data, we estimate that total PCE prices rose 2.6 percent over the 12 months ending in November; and that, excluding the volatile food and energy categories, core PCE prices rose 3.1 percent. The lower inflation readings over the past several months are welcome, but we will need to see further evidence to build confidence that inflation is moving down sustainably toward our goal. Longer-term inflation expectations appear to remain well anchored, as reflected in a broad range of surveys of households, businesses, and forecasters, as well as measures from financial markets. As is evident from the SEP [Summary of Economic Projections], we anticipate that the process of getting inflation all the way to 2 percent will take some time. The median projection in the SEP is 2.8 percent this year, falls to 2.4 percent next year, and reaches 2 percent in 2026.[22]

Chair Powell noted that the FOMC members project a gradual decline in the federal funds rates over time, although remain cautious and leave open the possibility of further monetary policy tightening as required:

> While we believe that our policy rate is likely at or near its peak for this tightening cycle, the economy has surprised forecasters in many ways since the pandemic, and ongoing progress toward our 2

[21] Federal Reserve, Transcript of Chair Powell's Press Conference, December 13, 2023, at 1.

[22] *Id*., at 2-3.

> percent inflation objective is not assured. We are prepared to tighten policy further if appropriate. We are committed to achieving a stance of monetary policy that is sufficiently restrictive to bring inflation sustainably down to 2 percent over time, and to keeping policy restrictive until we are confident that inflation is on a path to that objective.
>
> In our SEP [Summary of Economic Projections], FOMC participants wrote down their individual assessments of an appropriate path for the federal funds rate based on what each participant judges to be the most likely scenario going forward. While participants do not view it as likely to be appropriate to raise interest rates further, neither do they want to take the possibility off the table. If the economy evolves as projected, the median participant projects that the appropriate level of the federal funds rate will be 4.6 percent at the end of 2024, 3.6 percent at the end of 2025, and 2.9 percent at the end of 2026, still above the median longer-term rate. These projections are not a Committee decision or plan; if the economy does not evolve as projected, the path for policy will adjust as appropriate to foster our maximum employment and price stability goals.[23]

B. The Federal Reserve to Continue 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. Beginning in March 2022 and through May 3, 2023, the Federal Reserve increased the target federal funds rate through a series of increases from a range of 0.00 – 0.50 percent to a

[23] *Id*., at 3-4; clarification added.

range of 5.00 percent to 5.25 percent.[24] Further, as noted above, while the Federal Reserve acknowledges that inflation has declined from its peak, it still is well above the Federal Reserve's target of 2 percent. Therefore, the Federal Reserve anticipates the continued need to maintain the federal funds rate at a restrictive level in order to achieve its goal of 2 percent inflation over the long-run.

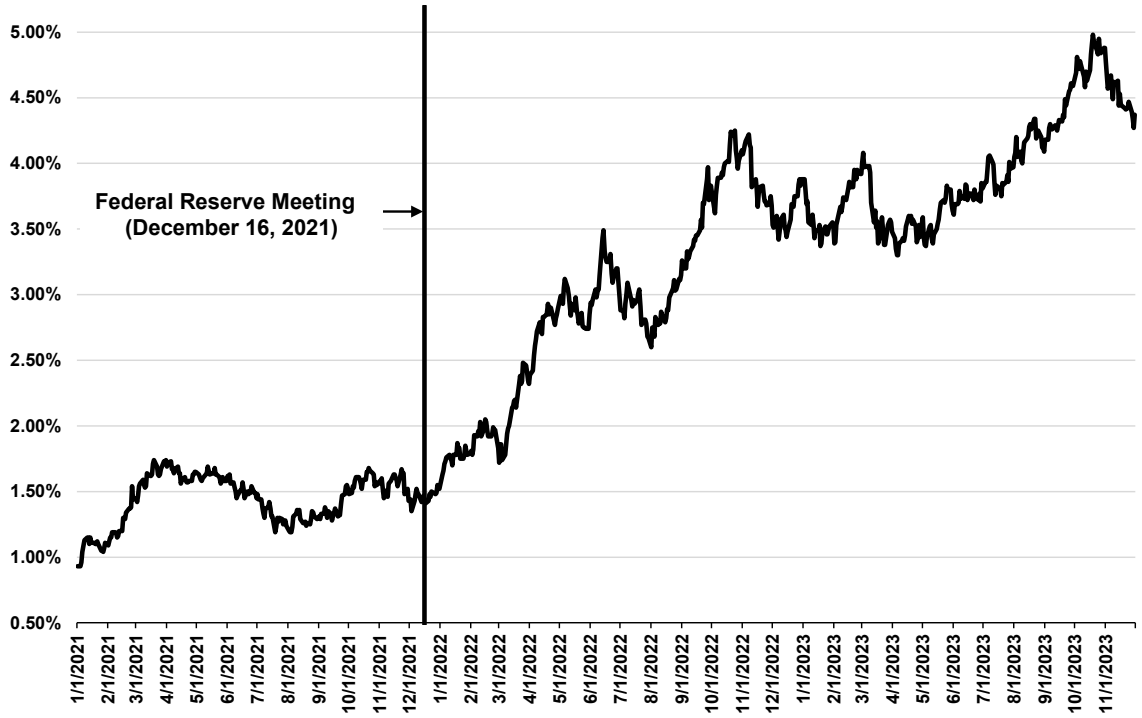
C. The Federal Reserve's Monetary Policy to Combat Inflation Has Increased Short- and Long-Term Interest Rates and the Investor-Required Return

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

A. Yes. As the Federal Reserve has substantially increased the federal funds rate and decreased its holdings of Treasury bonds and mortgage-backed securities in response to increased levels of inflation that have persisted for longer than originally projected, longer-term interest rates have also increased. For example, as shown in Figure AEB-D-3, since the Federal Reserve's December 2021 meeting, the yield on 10-year Treasury bonds has tripled, increasing from 1.47 percent on December 15, 2021 to 4.37 percent at the end of November 2023.

[24] Federal Reserve, Press Releases, March 16, 2022, May 4, 2022, June 15, 2022, September 22, 2022, November 2, 2022, February 1, 2023, March 22, 2023 and May 3, 2023.

Figure AEB-D-3:
10-Year Treasury Bond Yield, January 2021 November 2023[25]



Q. HOW HAVE INTEREST RATES AND INFLATION CHANGED SINCE THE COMPANY'S LAST RATE PROCEEDING?

A. Figure AEB-D-4 compares the short-term interest rates, long-term interest rates, and the inflation rates as of the Company's last rate proceeding to the current market conditions. Specifically, Figure AEB-D-4 presents the capital market conditions as of: (1) June 30, 2022 (*i.e.*, the date through which the data was reflected in the updated cost of equity analyses in the Company's rebuttal testimony in the last natural gas rate, Proceeding No. 22AL-0046G); (2) the date of the Commission's decision in that rate proceeding; and (3) the current market

[25] S&P Capital IQ Pro.

conditions through November 30, 2023. As can be seen, as a result of the Federal Reserve's monetary policy, inflation rates have declined as short-term and long-term interest rates have increased. Since the filing of the Company's rebuttal testimony in July 2022 in the Company's last gas rate proceeding, short-term interest rates have increased 375 basis points, and long-term interest rates have increased nearly 160 basis points. Likewise, since the Commission authorized an ROE in the range of 9.20 percent to 9.50 percent in the Company's last gas rate proceeding, short-term interest rates have increased 225 basis points and long-term interest rates have increased over 90 basis points.

Figure AEB-D-4:
Change in Market Conditions Since the Company's Last Rate Proceeding

Docket	Date	Federal Funds Rate	30-Day Avg of 30-Year Treasury Bond Yield	Core Inflation Rate	Auth'd ROE
22AL-0046G	6/30/2022	1.58%	3.18%	5.88%	
22AL-0046G	10/25/2022	3.08%	3.84%	6.30%	9.20-9.50%
Current	11/30/2023	5.33%	4.76%	4.02%	

Q. WHAT HAVE EQUITY ANALYSTS SAID ABOUT LONG-TERM GOVERNMENT BOND YIELDS GOING FORWARD?

A. Leading equity analysts have noted that they expect the yields on long-term government bonds to remain elevated. For example, in the most recent Big Money poll released by *Barron's* in October 2023, which surveys money managers regarding the outlook for the next twelve months, two-thirds of the money managers surveyed expected the yield on the 10-year Treasury bond to be at least

4.50 percent in October 2024.[26] Similarly, the consensus estimate of the average yields on the 10-year and 30-year Treasury bonds as reported by *Blue Chip Financial Forecasts* are approximately 4.00 percent and 4.30 percent, respectively, through the first quarter of 2025.[27] Therefore, investors expect interest rates to remain elevated for at least the next 15 months. As a result, it is reasonable to expect that if government bond yields remain elevated, the cost of equity will remain materially higher than at the time of the Company's last natural gas rate proceeding.

D. Utility Stocks Expected to Continue to Underperform, Demonstrating a Higher Cost of Equity than the Company's Last Natural Gas Rate Proceeding

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

A. Yes. Interest rates on long-term government bonds 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

[26] Nicholas Jasinski, "Big Money Pros Are Split on the Outlook for Stocks. But They Are Fans of Bonds," *Barron's*. October 27, 2023.

[27] *Blue Chip Financial Forecasts*, Vol. 42, No. 12, December 1, 2023, at 2.

with bond yields (*i.e.*, increases in bond yields resulted in the decline of utility share prices).[28]

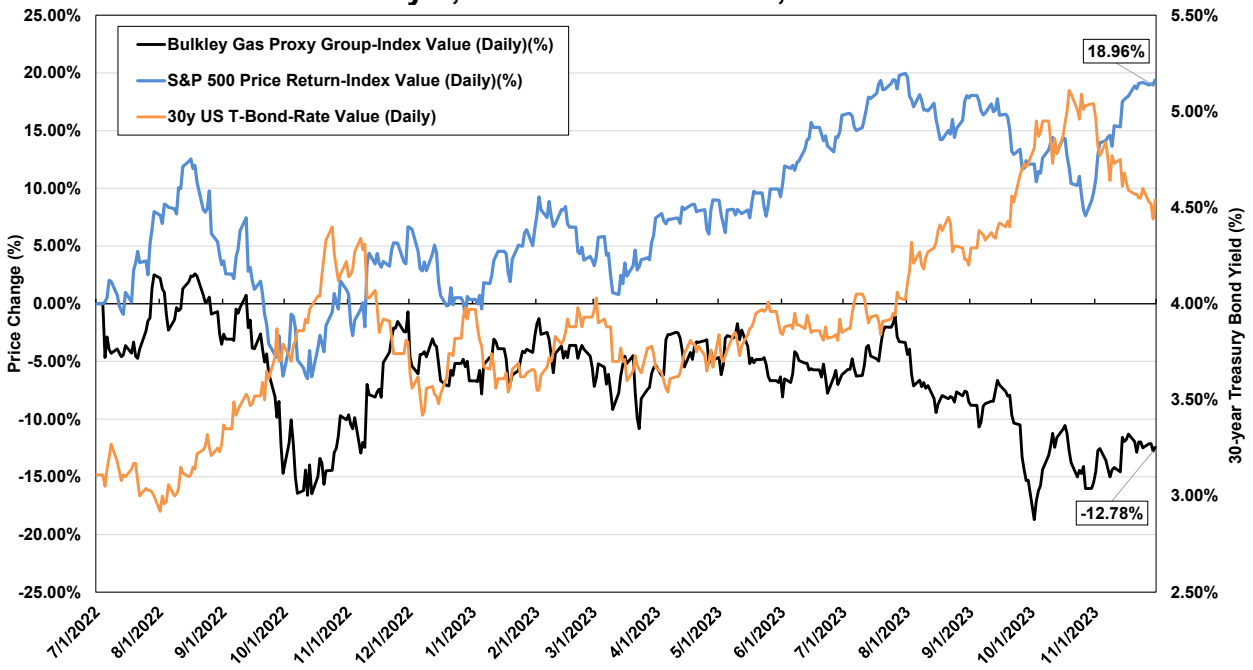
Q. IN THE COMPANY'S PRIOR RATE PROCEEDING IN PROCEEDING NO. 22AL-0046G, YOU DISCUSSED EQUITY ANALYSTS' EXPECTED UNDERPERFORMANCE OF THE UTILITY SECTOR. DID THAT OCCUR?

A. Yes. Since the filing of my rebuttal testimony in July 2022 in the Company's last natural gas rate proceeding, utility stocks have significantly underperformed the broader market, as Treasury bond yields have increased to levels greater than the dividend yields of utility stocks. For example, as shown in Figure AEB-D-5, since July 2022, the yield on the 30-year Treasury bond has increased over 140 basis points, while the share prices for the natural gas utilities included in my proxy group (discussed in the following section) have declined by 12.8 percent, notwithstanding that the S&P 500 Index has increased nearly 19.0 percent. In fact, on October 2, 2023, the utilities sector dropped by 4.7 percent, its single highest one-day percentage decline since April 2020.[29] The stock price underperformance for the utility sector indicates that the cost of equity has increased since the Company's last rate proceeding.

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

[29] Caroline Valetkevich, "S&P 500 ends near flat; utilities drop, focus on rate outlook," Reuters, October 2, 2023.

Figure AEB-D-5:
Relative Performance of the Proxy Group and the S&P 500,
July 1, 2022 – November 30, 2023[30]



Q. HOW DO EQUITY ANALYSTS EXPECT THE UTILITIES SECTOR TO PERFORM IN 2024?

A. Equity analysts have recently projected the continued underperformance of the utility sector, and have not changed their views on the sector. For example, Fidelity Investments classifies the utility sector as underweight,[31] and Bank of America recently noted that they are "not so constructive on [u]tilities" given that the dividend yields for utilities are below both the yields available on long- and short-term treasury bonds.[32] Moreover, the professional investors surveyed by *Barron's*

30 S&P Capital IQ Pro.

31 Fidelity Investments, "Fourth Quarter 2023 Investment Research Update," October 19, 2023.

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

in its most recent Big Money poll selected the utility sector as one of the four equity sectors that they liked the least over the next twelve months, indicating they are projecting that utilities will underperform the broader market in 2024.[33]

Q. WHY DO EQUITY ANALYSTS EXPECT THE UTILITY SECTOR TO CONTINUE TO UNDERPERFORM OVER THE NEAR-TERM?

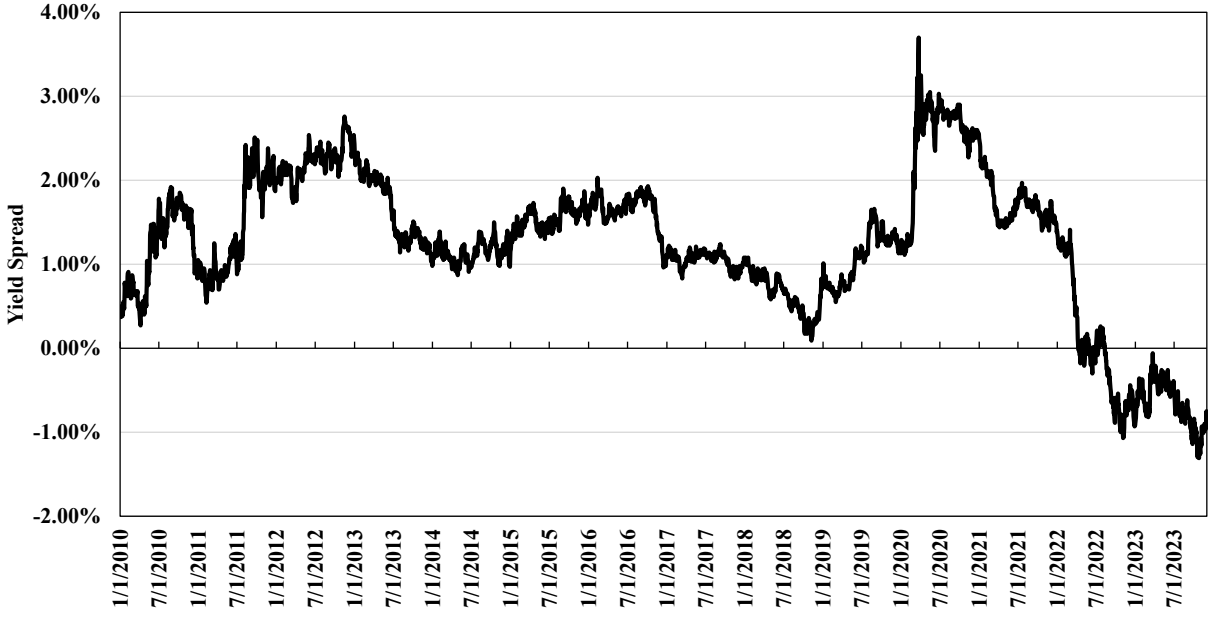
A. Equity analysts expect the utility sector to continue to underperform given that utility dividend yields remain lower than the yields on long-term government bonds. To illustrate this point, I have examined the difference between the dividend yields of utility stocks and the yields on long-term government bonds from January 2010 through November 2023 ("yield spread"). I selected the dividend yield on the S&P ("Standard & Poor's") Utilities Index as the measure of the dividend yields for the utility sector and the yield on the 10-year Treasury bond as the estimate of the yield on long-term government bonds.

As shown in Figure AEB-D-6, the recent significant increase in long-term government bonds yields has resulted in the yield on long-term government bonds exceeding the dividend yields of utilities. Specifically, the yield spread as of November 30, 2023 was negative 0.87 percent, meaning that the yield on the 10-year Treasury bond exceeds the dividend yield for the S&P Utilities Index. However, the long-term average yield spread from 2010 to 2023 is 1.23 percent. Therefore, the current yield spread is well below the long-term average. Because of the fact that the yield spread is currently well below the long-term average, and

[33] Nicholas Jasinski, "Big Money Pros Are Split on the Outlook for Stocks. But They Are Fans of Bonds," *Barron's*, October 27, 2023.

the expectation that interest rates will remain relatively high through at least the next year, it is reasonable to conclude that the utility sector may continue to underperform in 2024. 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 into government bonds given the yields on long-term government bonds remain elevated and higher than utility dividend yields, thus resulting in a decrease in the share prices of utilities.

Figure AEB-D-6:
Spread between the S&P Utilities Index Dividend Yield and the 10-year Treasury Bond Yield, January 2010 – November 2023[34]



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

Q. DO YOU HAVE ANY FURTHER CONTEXT AS TO HOW UNLIKELY IT IS TO HAVE A NEGATIVE YIELD SPREAD OF THIS MAGNITUDE?

A. Yes. For further context as to how unlikely it is to have a yield spread of negative 0.87 percent, I calculated the z-score for the current yield spread, which measures the number of standard deviations from the mean. The current yield spread has a z-score of -2.44, indicating that the current yield spread is over 2 standard deviations from the mean of 1.23 percent.[35] In other words, 95 percent of the daily yield spread observations from 2010 through November 2023 fall between -0.49 percent and 2.96 percent, with the current yield spread falling outside of that range. Thus, the current yield spread is an outlier, which is why equity analysts do not expect this current level to hold.

The underperformance of utility stocks in 2023 and negative yield spread both demonstrate that the cost of equity for utility stocks has increased as compared with the market conditions at the time of the Company's last rate proceeding.

E. Conclusion

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

A. Due to their effect on the estimated cost of equity, it is important that current and projected market conditions be considered in setting the forward-looking ROE in

[35] The z-score is calculated as: (yield spread at November 30, 2023 minus average yield spread 2010 through November 2023)/standard deviation of yield spread from 2010 through November 2023. This equals: (-0.0087 minus 0.0123)/0.0086.

this proceeding. The combination of persistently high inflation and the Federal Reserve's changes in monetary policy that have increased interest rates demonstrate that the cost of equity has increased since the Company's last natural gas rate proceeding since (i) there is a strong historical inverse correlation between interest rates (*i.e.*, yields on long-term government bonds) and the share prices of utility stocks (*i.e.*, as interest rates increase, utility share prices decline, and thus utility dividend yields increase); and (ii) the yields on long-term government bonds currently exceed the dividend yields of utilities, when historically long-term government bond yields have been lower than the dividend yields of utilities. Because the cost of equity has increased since the Company's last natural gas rate proceeding, cost of equity estimates based in whole or in part on historical or current market conditions, as opposed to projected market conditions, may understate the cost of equity during the future period that the Company's rates will be in effect. Therefore, these current and expected market conditions support consideration of forward-looking cost of equity estimation models such as the CAPM and ECAPM, which better reflect expected market conditions.

V. PROXY GROUP SELECTION

Q. PLEASE PROVIDE A BRIEF PROFILE OF PUBLIC SERVICE.

A. Public Service is a wholly-owned subsidiary of Xcel Energy that provides electric generation, transmission, and distribution services to approximately 1.6 million customers, and gas distribution service to approximately 1.5 million customers in Colorado.[36] Public Service currently has a credit rating of A- with a "negative" outlook from S&P and a credit rating of A3 with a "stable" outlook from Moody's Investors Service ("Moody's").

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

A. In this proceeding, I am estimating the cost of equity for Public Service, a rate-regulated subsidiary of Xcel Energy. Since the cost of equity is a market-based concept and given the fact that Public Service's Gas distribution business does 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 Public Service in certain fundamental business and financial respects to serve as its "proxy" for purposes of estimating the cost of equity.

The overall purpose of developing a set of screening criteria is to select a proxy group of companies that aligns with the financial and operational characteristics of Public Service and that investors would view as comparable to the Company. I developed the screens and thresholds for each screen based on

[36] Xcel Energy Inc., SEC Form 10-K, February 23, 2023, at 9.

judgment with the intention of balancing the need to maintain a proxy group that is of sufficient size with the need to establish a proxy group of companies that are comparable in business and financial risk to Public Service.

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

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

A. I began with the group of 10 companies that *Value Line* classifies as Natural Gas Distribution Utilities and applied the following screening criteria to select companies that:

- pay consistent quarterly cash dividends, since companies that do not pay dividends cannot be analyzed using the constant growth DCF model;
- have investment grade long-term issuer ratings from both S&P and 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;
- derive more than 70.00 percent of their total operating income from regulated operations;
- derive more than 60.00 percent of regulated operating income from gas distribution operations; and;

- were not parties to a merger or transformative transaction during the analytical periods relied on, or had a material event that would have affected the market data for the company.

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

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

Q. WHAT IS THE COMPOSITION OF YOUR PROXY GROUP?

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

Figure AEB-D-7:
Natural Gas Utility Proxy Group Composition

Company	Ticker
Atmos Energy Corporation	ATO
NiSource Inc.	NI
Northwest Natural Gas Company	NWN
ONE Gas, Inc.	OGS
Spire, Inc.	SR

Q. HAS THE COMMISSION PREVIOUSLY RELIED ON COMBINATION GAS AND ELECTRIC COMPANIES TO ESTABLISH THE PROXY GROUP FOR PUBLIC SERVICE?

A. Yes, in the past, the Commission has authorized an ROE for the Company that relied on a cost of equity result produced by a proxy group consisting of combination electric and natural gas utilities.[37] I recognize that Public Service

[37] *See, e.g.*, Proceeding No. 17AL-0363G, Decision No. R18-0318-I, at ¶ 56 and Proceeding No. 17AL-0363G, Decision No. C18-0736-I, at ¶ 61.

operates as a combination gas and electric utility and raises capital as a combination company, meaning it does not issue separate debt or equity for the gas and electric operations. However, given that the Commission is setting the authorized ROE for Public Service's natural gas distribution business, and as described elsewhere herein, natural gas distribution companies face specific business risks relative to an energy landscape transitioning from the use of fossil fuels, the current circumstances warrant a proxy group that reflects only natural gas distribution companies. A proxy group consisting of natural gas distribution utilities is comparable to Public Service's natural gas business from a risk perspective and thus consistent with how investors would establish their return requirements for the Public Service gas business.

Q. HAVE YOU ALSO EVALUATED THE COST OF EQUITY USING A PROXY GROUP OF COMBINATION NATURAL GAS AND ELECTRIC UTILITIES?

A. Yes. While a proxy group that consists solely of natural gas utilities is the most appropriate in the current circumstances for the reasons just discussed, I have also evaluated the cost of equity using a proxy group of combination natural gas and electric utilities as a check on the reasonableness of the results of the primary proxy group.

Q. HOW DID YOU SELECT THE COMPANIES IN YOUR COMBINATION UTILITY PROXY GROUP?

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

- pay consistent quarterly cash dividends, since companies that do not pay dividends cannot be analyzed using the constant growth DCF model;
- have investment grade long-term issuer ratings from both S&P and 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 generation assets included in rate base;
- have more than 40 percent of company-owned generation;
- derive more than 70.00 percent of their total operating income from regulated operations;
- derive more than 10 percent of total regulated operating income from regulated gas operations; and;
- were not parties to a merger or transformative transaction during the analytical periods relied on.

Q. WHAT IS THE COMPOSITION OF YOUR COMBINED UTILITY PROXY GROUP?

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

Figure AEB-D-8:
Combination Utility Proxy Group Composition

Company	Ticker
NiSource Inc.	NI
Ameren Corporation	AEE
Avista Corporation	AVA
CMS Energy Corporation	CMS
MGE Energy, Inc.	MGEE
NorthWestern Corporation	NWE
Southern Company	SO
Wisconsin Energy Corporation	WEC

VI. COST OF EQUITY ESTIMATION

Q. PLEASE BRIEFLY DISCUSS THE ROE IN THE CONTEXT OF THE REGULATED RATE OF RETURN.

A. The rate of return for a regulated utility is the weighted average cost of capital, in which the costs of the individual sources of capital are weighted by their respective proportion (*i.e.*, book values) in the utility's capital structure. The ROE is the cost rate applied to the equity capital in calculating the rate of return. While the costs of debt and preferred stock can be directly observed, the cost of equity is market-based and, therefore, must be estimated based on observable market data.

Q. HOW IS THE REQUIRED COST OF EQUITY DETERMINED?

A. The range of the required cost of equity is estimated by using analytical techniques that rely on market-based data to quantify investor expectations regarding equity returns. Within that range, the ROE that is recommended is based on a review of the business, regulatory, and financial risks of the subject utility as compared with the proxy group, including the capital structure of the subject utility. The key consideration in determining the cost of equity is to ensure that the methodologies employed reasonably reflect investors' views of the financial markets in general, as well as the subject company (in the context of the proxy group), in particular. Further, it is important that the ROE or range of ROEs that is authorized take into consideration the financial risk resulting from the authorized capital structure of the subject utility. An authorized capital structure that has a greater amount of leverage results in greater risk since equity is the last claimant in the event of the dissolution of a company. Therefore, as the leverage in the capital structure

increases, it is necessary for the ROE or ROE range to increase to recognize the incremental risk to equity holders.

Q. WHAT METHODS HAVE YOU USED TO ESTIMATE PUBLIC SERVICE'S COST OF EQUITY?

A. I consider the results of the constant growth DCF model, the multi-stage DCF model, the CAPM, the ECAPM, and a BYRP approach. A reasonable cost of equity estimate appropriately considers alternative methodologies and the reasonableness of their individual and collective results.

Q. IS IT IMPORTANT TO USE MORE THAN ONE ANALYTICAL APPROACH?

A. Yes. Because the cost of equity is not directly observable, it must be estimated based on both quantitative and qualitative information. When faced with the task of estimating the cost of equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed. Several models have been developed to estimate the cost of equity, and 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 well-regarded finance texts recommend using multiple approaches when estimating the cost of equity. For example, Copeland, Koller, and Murrin[38] suggest using the CAPM and

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

Arbitrage Pricing Theory model, while Brigham and Gapenski[39] recommend the CAPM, DCF, and BYRP approaches.

Although the use of multiple analytical approaches is generally appropriate, current market conditions particularly highlight the importance of using more than one analytical approach to estimating the cost of equity. As discussed previously, interest rates have increased substantially over the past two years and are expected to remain elevated over at least the next year from the lows seen during the COVID-19 pandemic. While the share prices of utilities have declined, the negative yield spread is an indication that utility share prices have not declined sufficiently to account for the recent rise in interest rates. As a result, equity analysts expect the utility sector to continue to underperform over the next year, and thus it is reasonable to conclude that the DCF model is likely understating the forward-looking cost of equity because the model relies on historical share prices to calculate the dividend yield. These recent changes in market conditions highlight the benefit of using multiple models since each model relies on different assumptions, certain of which better reflect current and projected market conditions at different times. As discussed previously, the CAPM, ECAPM, and BYRP analyses offer some balance through the use of projected market data.

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

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

A. Yes. As has been stated by the Commission:

> We agree with Public Service and the other parties that, in principle, no single rate of return model should be relied on in the determination of the ROE. At the same time, all model results entered into the evidentiary record have some relevance and should be considered with varying degrees of weight.[40]

Similarly, in the Company's last natural gas rate proceeding (*i.e.*, Proceeding No. 22AL-0046G), the Commission noted that its determination was based on weighing all the evidence in the record, including each of the ROE models presented.[41] Also in that proceeding, it is my understanding that the Commission indicated in its deliberations that it would like the Company to include in the future the multi-stage DCF model for consideration. As such, I have conducted a multi-stage DCF analysis and consider the results of multiple models to confirm the reasonableness of the collective results.

[40] Proceeding No. 19AL-0268E, Decision Permanently Suspending Tariff Sheets; Granting Joint Motion to Approve Partial Settlement Agreement on Wildfire Mitigation; Denying Motion for Rates Effective January 1, 2020; Establishing Rates; and Requiring Filings, February 11, 2020, at ¶ 97.

[41] Proceeding No. 22AL-0046G, Decision Permanently Suspending Tariff Sheets, Establishing Rates and Requiring Filings, at ¶ 127.

A. Constant Growth DCF Model

Q. PLEASE DESCRIBE THE DCF APPROACH.

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

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

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

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

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 (*i.e.*, "*g*").

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

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

Q. WHAT MARKET DATA DO 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 group companies' current annual dividend and average closing stock prices over the 30-, 90-, and 180-trading days ended November 30, 2023.

Q. WHY DO YOU USE 30-, 90-, AND 180-DAY AVERAGING PERIODS?

A. In my constant growth DCF model, I use an average of recent trading days to calculate the term P_0 in the DCF model to ensure that the cost of equity 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, the averaging periods that I use rely on historical data that are not consistent with the forward-looking market expectations at this time. Therefore, the results of the constant growth DCF model may underestimate the forward-looking cost of equity, which, as discussed, has been recognized by regulators in the current market conditions. As a result, I place more weight on the mean to mean-high results produced by my constant growth DCF model.

Q. DO YOU MAKE ANY ADJUSTMENTS TO THE DIVIDEND YIELD TO ACCOUNT FOR PERIODIC GROWTH IN DIVIDENDS?

A. Yes. Since 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 long-term growth rate in perpetuity. In order to reduce the long-term growth rate to a single measure, one must assume that the dividend payout ratio remains constant and that earnings per share ("EPS"), dividends per share, and book value per share all grow at the same constant rate. However, over the long run, dividend growth can only be sustained by earnings growth, meaning earnings are the fundamental driver of a company's ability to pay dividends. Therefore, projected EPS growth is the appropriate measure of a company's long-term growth. In contrast, changes in a company's dividend payments are based on management decisions related to cash management and other factors. For example, a company may decide to retain earnings rather than pay out a portion of those earnings to shareholders through dividends. Therefore, dividend growth rates are less likely than earnings growth rates to accurately reflect investor perceptions of a company's growth prospects. Accordingly, I have incorporated a number of sources of long-term EPS growth rates into the constant growth DCF model.

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

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

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

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

F. Multi-Stage DCF Model

Q. HAVE YOU ALSO CONDUCTED A MULTI-STAGE DCF MODEL?

A. Yes. In the Company's most recent natural gas rate proceeding (Proceeding No. 22AL-0046G), it is my understanding that the Commission indicated in its deliberations that it would like the Company to include the multi-stage DCF model in future cases for consideration. As such, I have conducted a multi-stage DCF analysis and consider the results of multiple cost of equity models to confirm the reasonableness of the results in aggregate.

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

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

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

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

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

A. As shown in Attachment AEB-5, I begin with the current annualized dividend as of November 30, 2023 for each proxy group company. In the first stage of the model,

the current annualized dividend is escalated based on the average of the projected three- to five-year EPS growth rate estimates reported by *Zacks*, Yahoo! Finance, and *Value Line*. For the third stage, I rely on a long-term projected GDP growth rate. The second stage growth rate is a transition from the first stage growth rate to the long-term growth rate on a geometric average basis.

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

A. As shown on Attachment AEB-5, the long-term growth rate of 5.51 percent is based on real GDP growth rate of 3.18 percent from 1929 through 2022,[42] and a projected inflation rate of 2.26 percent. The projected inflation rate is based on three measures: (1) the consensus estimate long-term projected growth rate in the CPI as published by *Blue Chip Financial Forecasts*;[43] (2) the compound annual growth rate of the CPI for all urban consumers for 2033-2050 as projected by the Energy Information Administration ("EIA");[44] and (3) the compound annual growth rate of the GDP chain-type price index for 2033-2050 as projected by the EIA.[45]

Q. DO THE ASSUMPTIONS USED IN THE MULTI-STAGE DCF MODEL ADDRESS THE ISSUE THAT IF UTILITY STOCK PRICES CONTINUE TO DECLINE, AND

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[42] U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Tables, Table 1.1.1, November 29, 2023.

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

[44] U.S. Energy Information Administration, Annual Energy Outlook 2023, Table 20, Macroeconomic Indicators, March 16, 2023.

[45] *Id*.

THUS UTILITY DIVIDEND YIELDS INCREASE, THAT THE COST OF EQUITY RESULTING FROM THE DCF WILL BE UNDERSTATED?

A. No. While the multi-stage DCF model provides for changes in growth over time, it does not address the current circumstance in which utility dividend yields are significantly less attractive than Treasury bond yields, and thus utility stocks are expected to continue to underperform. As a result, the cost of equity resulting from these assumptions is likely understated. For that reason, just as with the constant growth DCF, I have also considered the results of risk-premium based methodologies, which are discussed later herein.

Q. WHAT ARE THE RESULTS OF YOUR DCF ANALYSES?

A. Figure AEB-D-9 (see also Attachments AEB-4 and AEB-5) summarizes the results of my DCF analyses using the natural gas utility proxy group, and Figure AEB-D-10 summarizes the results of the combination utility proxy group.

Figure AEB-D-9:
Summary of DCF Results Natural Gas Proxy Group

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.89%	10.84%	12.02%
90-Day Avg. Stock Price	9.72%	10.67%	11.85%
180-Day Avg. Stock Price	9.53%	10.48%	11.66%
Average	9.72%	10.66%	11.84%
Median Results:			
30-Day Avg. Stock Price	10.03%	10.30%	11.92%
90-Day Avg. Stock Price	9.97%	10.24%	11.70%
180-Day Avg. Stock Price	9.95%	10.22%	11.38%
Average	9.98%	10.25%	11.67%

Multi-Stage DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	10.06%	10.32%	10.67%
90-Day Avg. Stock Price	9.88%	10.14%	10.47%
180-Day Avg. Stock Price	9.68%	9.93%	10.25%
Average	9.87%	10.13%	10.46%
Median Results:			
30-Day Avg. Stock Price	10.16%	10.47%	10.80%
90-Day Avg. Stock Price	10.08%	10.39%	10.71%
180-Day Avg. Stock Price	9.85%	10.27%	10.60%
Average	10.03%	10.37%	10.70%

Figure AEB-D-10:
Summary of DCF Results Combined Utility Proxy Group

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.62%	10.30%	10.92%
90-Day Avg. Stock Price	9.58%	10.26%	10.88%
180-Day Avg. Stock Price	9.41%	10.08%	10.71%
Average	9.54%	10.21%	10.84%
Median Results:			
30-Day Avg. Stock Price	9.66%	9.97%	10.93%
90-Day Avg. Stock Price	9.59%	9.95%	10.88%
180-Day Avg. Stock Price	9.45%	9.86%	10.62%
Average	9.57%	9.93%	10.81%

Multi-Stage DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.77%	9.94%	10.10%
90-Day Avg. Stock Price	9.73%	9.89%	10.05%
180-Day Avg. Stock Price	9.53%	9.70%	9.85%
Average	9.68%	9.84%	10.00%
Median Results:			
30-Day Avg. Stock Price	9.62%	9.87%	10.08%
90-Day Avg. Stock Price	9.60%	9.87%	10.09%
180-Day Avg. Stock Price	9.48%	9.77%	9.99%
Average	9.57%	9.84%	10.05%

Q. HAVE REGULATORY COMMISSIONS ACKNOWLEDGED THAT THE DCF MODEL MIGHT UNDERSTATE THE COST OF EQUITY GIVEN THE CURRENT CAPITAL MARKET CONDITIONS OF HIGH INFLATION AND INCREASED 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.[46]

Similarly, the Massachusetts Department of Public Utilities in a recent rate case for NSTAR Electric Company concluded that given the recent increase in interest rates there was "greater certainty" that the results of the DCF model were understating the cost of equity for the utility.[47]

G. CAPM Analysis

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-diversifiable or "systematic" risk of that security.[48] 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:

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

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

[47] Massachusetts Department of Public Utilities, D.P.U. 22-22, November 30, 2022,at 385-386.

[48] Systematic risk is the risk inherent in the entire market or market segment, which cannot be diversified away using a portfolio of assets. Unsystematic risk is the risk of a specific company that can, theoretically, be mitigated through portfolio diversification.

Where:

K_e = the required market ROE;

β = the beta coefficient of an individual security;

r_f = the risk-free rate of return; and

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, because unsystematic risk can be diversified away, investors should only be concerned with systematic risk. Systematic risk is measured by beta, which is a measure of the volatility of a security as compared to the overall market. Beta is defined as:

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

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

Q. WHAT RISK-FREE RATE DO YOU USE IN YOUR CAPM ANALYSIS?

A. I rely on three sources for my estimate of the risk-free rate: (1) the current 30-day average yield on 30-year Treasury bonds, which is 4.77 percent;[49] (2) the average projected 30-year Treasury bond yield for the first quarter of 2024 through the first

[49] *Bloomberg*, as of November 30, 2023.

quarter of 2025, which is 4.48 percent;[50] and (3) the average projected 30-year Treasury bond yield for 2025 through 2029, which is 4.10 percent.[51]

Q. WHAT BETA COEFFICIENTS DO YOU USE IN YOUR CAPM ANALYSIS?

A. As shown in Attachment AEB-6, I use the beta coefficients for the proxy group companies as reported by *Bloomberg Professional* ("*Bloomberg")* and *Value Line*. The beta coefficients reported by *Bloomberg* are calculated using ten years of weekly returns relative to the S&P 500 Index. The beta coefficients reported by *Value Line* are calculated based on five years of weekly returns relative to the New York Stock Exchange Composite Index. Additionally, as shown in Attachments AEB-6 and AEB-7, I also consider an additional CAPM analysis that relies on the long-term average beta coefficient reported by *Value Line* for the companies in my proxy group from 2013 through 2022.

Q. HOW DO YOU ESTIMATE THE MARKET RISK PREMIUM IN THE CAPM?

A. I estimate the market risk premium as the difference between the implied expected equity market return and the risk-free rate. As shown on Attachment AEB-8, the expected return on the S&P 500 Index is calculated using the constant growth DCF model discussed previously as applied to the companies in the S&P 500 Index. Based on an estimated market capitalization-weighted dividend yield of 1.88 percent and a weighted long-term growth rate of 10.51 percent, the estimated required market return for the S&P 500 Index as of November 30, 2023 is 12.56 percent.

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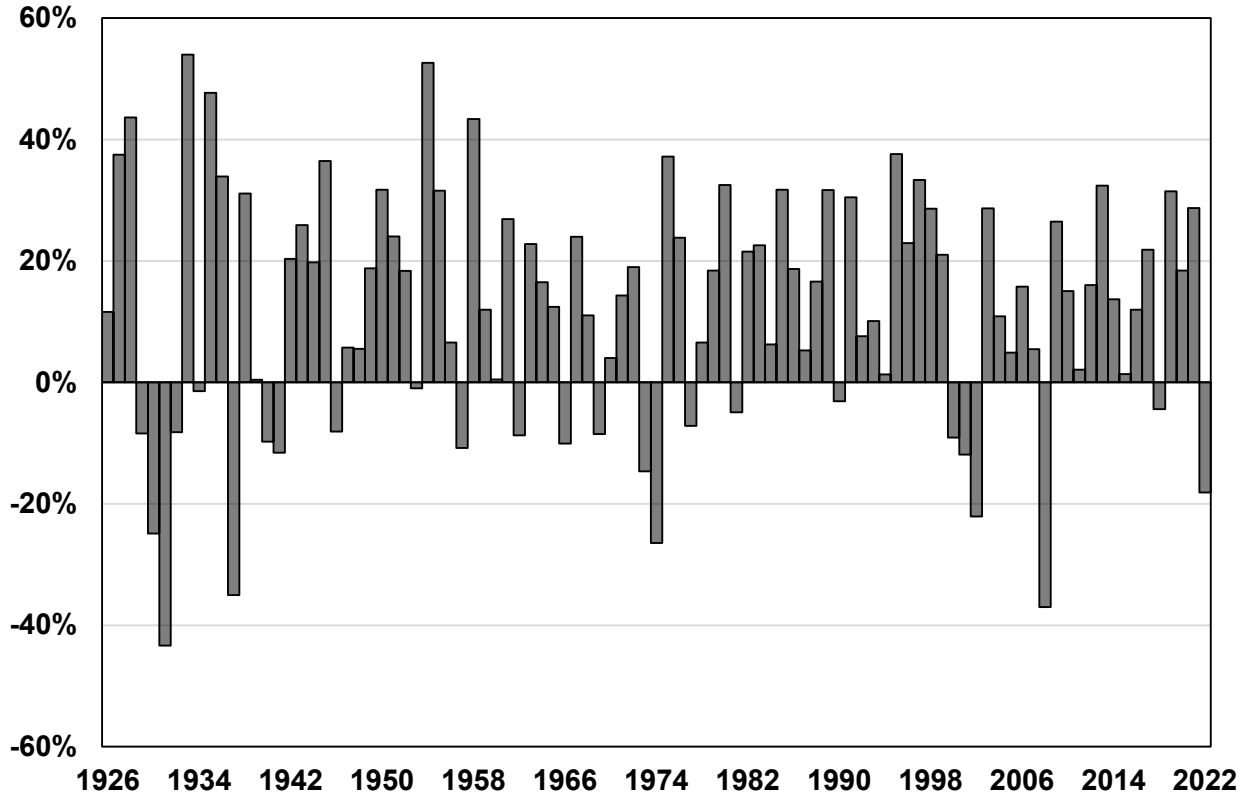
[50] *Blue Chip Financial Forecasts*, Vol. 42, No. 12, December 1, 2023, at 2.

[51] *Blue Chip Financial Forecasts*, Vol. 41, No. 6, June 1, 2023, at 14.

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

A. As shown in Figure AEB-D-11, given the range of annual equity returns that have been observed over the past century, a current expected return of 12.56 percent is not unreasonable. In 50 out of the past 97 years (or roughly 52 percent of observations), the realized equity return was at least 12.56 percent or greater.

Figure AEB-D-11:
Annual Realized U.S. Equity Market Returns (1926-2022)[52]



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

Q. HAVE YOU ALSO CONSIDERED ANOTHER FORM OF THE CAPM?

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

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

Where:

k_e = the required market ROE

β = the adjusted beta coefficient of an individual security

r_f = the risk-free rate of return

r_m = the required return on the market as a whole

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

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

[54] *Id.* at 191.

Consistent with my CAPM, my application of the ECAPM uses the forward-looking market risk premium estimates, the three yields on the 30-year Treasury bonds noted earlier as the risk-free rate, and the current *Bloomberg*, current *Value Line*, and long-term *Value Line* beta coefficients.

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

A. The results of my CAPM and ECAPM analyses for the natural gas utility proxy group are shown in Figure AEB-D-12, and in Figure AEB-D-13 for the combination utility proxy group are shown. These results are also presented in Attachment AEB-6 as well.

Figure AEB-D-12:
Summary of CAPM and ECAPM Results Natural Gas Utility Proxy Group

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.47%	11.43%	11.37%
Current Bloomberg Beta	10.72%	10.65%	10.56%
Long-term Avg. *Value Line* Beta	10.43%	10.35%	10.25%
ECAPM:			
Current *Value Line* Beta	11.74%	11.71%	11.67%
Current Bloomberg Beta	11.18%	11.13%	11.06%
Long-term Avg. *Value Line* Beta	10.96%	10.90%	10.83%

Figure AEB-D-13:
Summary of CAPM and ECAPM Results Combination Utility Proxy Group

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.44%	11.40%	11.34%
Current Bloomberg Beta	10.73%	10.66%	10.57%
Long-term Avg. *Value Line* Beta	10.30%	10.22%	10.11%
ECAPM:			
Current *Value Line* Beta	11.72%	11.69%	11.64%
Current Bloomberg Beta	11.19%	11.14%	11.07%
Long-term Avg. *Value Line* Beta	10.87%	10.80%	10.72%

H. BYRP Analysis

Q. PLEASE DESCRIBE THE BYRP ANALYSIS.

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

Q. WHAT IS THE FUNDAMENTAL RELATIONSHIP BETWEEN THE EQUITY RISK PREMIUM AND INTEREST RATES?

A. It is important to recognize both academic literature and market evidence indicating that the equity risk premium (as used in this approach) is inversely related to the level of interest rates (*i.e.*, as interest rates increase, the equity risk premium decreases, and vice versa). Consequently, it is important to develop an analysis that: (1) reflects the inverse relationship between interest rates and the equity risk premium; and (2) relies on recent and expected market conditions. The analysis presented in Attachment AEB-9 establishes that relationship using a regression of the risk premium as a function of Treasury bond yields. When the authorized ROEs serve as the measure of required equity returns and the long-term Treasury bond yield is defined as the relevant measure of interest rates, the risk premium is the difference between those two points.[55]

Q. IS THE BYRP ANALYSIS RELEVANT TO INVESTORS?

A. Yes. Investors are aware of authorized ROEs in other jurisdictions and they consider those awards as a benchmark for a reasonable level of equity returns for utilities of comparable risk operating in other jurisdictions. As discussed previously, utilities have experienced credit rating downgrades and been subject to a negative market reaction related to the financial effects of a rate case decision

[55] *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 (the author used a similar methodology, including using authorized ROEs as the relevant data source, and came to similar conclusions regarding the inverse relationship between risk premia and interest rates). *See also* Robert S. Harris, "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return," *Financial Management*, Spring 1986, at 66.

that included a below average authorized ROE. Because my BYRP analysis is based on authorized ROEs for utility companies relative to corresponding Treasury yields, it provides relevant information to assess the return expectations of investors in the current interest rate environment.

Q. WHAT DID YOUR BYRP ANALYSIS REVEAL?

A. As shown in Figure AEB-D-14, from 1980 through November 2023, there was a strong negative relationship between risk premia and interest rates. To estimate that relationship, I conducted a regression analysis using the following equation:

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

Where:

RP = Risk Premium (difference between authorized ROEs and the yield on 30-year Treasury bonds)

a = intercept term

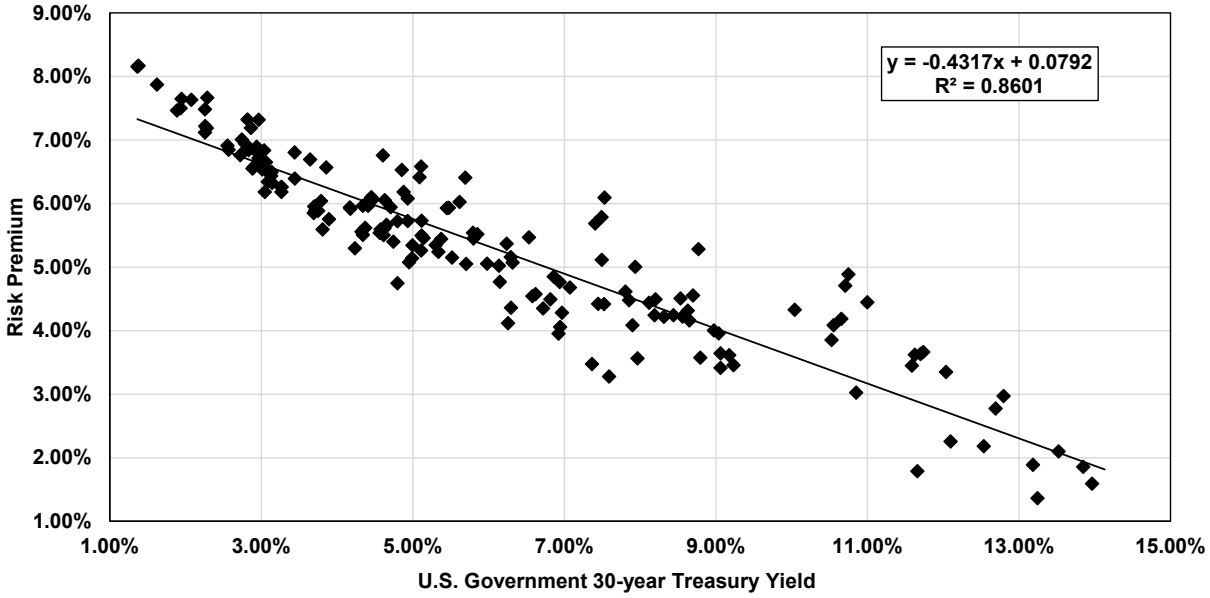
b = slope term

T = 30-year Treasury bond yield

Data regarding authorized ROEs are derived from all of the natural gas utility rate cases over this period as reported by Regulatory Research Associates.[56] The equation's coefficients were statistically significant at the 99.00 percent level.

[56] The data was screened to eliminate limited issue rider cases, pipeline transmission cases, and cases that were silent with respect to the authorized ROE.

Figure AEB-D-14:
Risk Premium Regression Analysis



Similarly, as shown in Attachment AEB-9, data is also derived regarding authorized ROEs from all of the electric utility rate cases over this same time period, and the equation's coefficients are also statistically significant at the 99.00 percent level.

Q. WHAT ARE THE RESULTS OF YOUR BYRP ANALYSIS?

A. Figure AEB-D-15 presents the results of my BYRP analysis, which are also presented in more detail in Attachment AEB-9.

Figure AEB-D-15:
Summary of BYRP Results Natural Gas Utilities

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
Bond Yield Risk Premium	10.63%	10.46%	10.25%

Figure AEB-D-16:
Summary of BYRP Results Electric Utilities

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
Bond Yield Risk Premium	10.79%	10.62%	10.40%

I. Flotation Costs

Q. WHAT ARE FLOTATION COSTS?

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

Q. WHY IS IT IMPORTANT TO CONSIDER FLOTATION COSTS IN THE AUTHORIZED ROE?

A. A regulated utility must have the opportunity to earn an ROE that is both competitive and compensatory to attract and retain new investors. To the extent that a utility is denied the opportunity to recover prudently incurred flotation costs, actual returns will fall short of expected (or required) returns, thereby diluting equity share value.

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

A. Yes. Flotation costs are part of the invested costs of the utility, which are properly reflected on the balance sheet under "paid in capital." They are not current expenses, and, therefore, are not reflected on the income statement. Rather, like investments in rate base or the issuance costs of long-term debt, flotation costs are incurred over time. As a result, the majority of a utility's flotation costs are incurred prior to the test year but remain part of the cost structure that exists during the test year and beyond and, as such, should be recognized for ratemaking purposes. Therefore, it is irrelevant whether an issuance occurs during the test year or is planned for the test year because failure to allow recovery of past flotation costs may deny the Company the opportunity to earn its required rate of return in the future.

Q. PLEASE PROVIDE AN EXAMPLE OF WHY A FLOTATION COST ADJUSTMENT IS NECESSARY TO COMPENSATE INVESTORS FOR THE CAPITAL THAT THEY HAVE INVESTED.

A. Assume Xcel Energy issues stock with a value of $100, and an equity investor invests $100 in Xcel Energy in exchange for that stock. Further, suppose that after paying the flotation costs associated with the equity issuance, which include fees paid to underwriters and attorneys, among others, Xcel Energy ends up with only $97 of issuance proceeds, rather than the $100 the investor contributed. Xcel Energy then invests that $97 in plant used to serve its customers, which becomes part of rate base. Absent a flotation cost adjustment, the investor will thereafter

earn a return on only the $97 invested in rate base, even though she contributed $100. Making a small flotation cost adjustment gives the investor a reasonable opportunity to earn the authorized return, rather than the lower return that results when the authorized return is applied to an amount less than what the investor contributed.

Q. IS THE DATE OF XCEL ENERGY'S LAST ISSUANCE OF COMMON EQUITY IMPORTANT IN THE DETERMINATION OF FLOTATION COSTS?

A. No. It is important to recognize flotation costs for all equity issuances since these costs reduce the permanent capital structure of the company. Therefore, the vintage of the issuance is not particularly important because an investor should have a reasonable opportunity to earn a return on the full amount of capital that she has contributed in every year of the investment. As noted in my earlier example, the investor contributed $100, but due to flotation costs, Xcel Energy only ends up with $97 to invest in rate base. Without the recognition of flotation costs, the investor will only earn a return on the $97 invested in rate base in year 1 as well as every subsequent year of the investment. Therefore, adjusting the ROE in year 1 to recognize flotation costs will only award the opportunity for the investor to earn a return on her full investment in year 1, while in year 2 and thereafter the investor will still only earn a return on the $97 invested in rate base. As a result, the ROE should be adjusted for flotation costs in every year regardless of the vintage of the issuance, because as long as the $100 is invested, the investor should have a reasonable opportunity to earn a return on the entire amount.

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

A. No. Although Public Service is a wholly-owned subsidiary of Xcel Energy, it is appropriate to consider flotation costs for two reasons. First, a substantial portion of Public Service's paid-in equity is the result of prior public issuances of common stock made by Public Service at a time when Public Service was itself a publicly-traded entity. Second, wholly-owned subsidiaries receive equity capital from their parent and provide returns on the capital that roll up to the parent, which is designated to attract and raise capital based upon the returns of those subsidiaries. To deny recovery of issuance costs associated with the capital that is invested in the subsidiaries ultimately penalizes the investors that fund the utility operations and inhibits the utility's ability to obtain new equity capital at a reasonable cost.

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

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

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

> costs. Because of this reduction in proceeds, the firm's required returns on these proceeds equate to a higher return to compensate for the additional costs. Flotation costs can be accounted for either by amortizing the cost, thus reducing the cash flow to discount, or by incorporating the cost into the cost of capital. Because flotation costs are not typically applied to operating cash flow, one must incorporate them into the cost of capital.[57]

Q. HAVE YOU ESTIMATED WHAT A REASONABLE FLOTATION COST ADJUSTMENT WOULD BE FOR PUBLIC SERVICE?

A. Yes. My flotation cost calculation is based on the equity issuance costs that were incurred by Xcel Energy and its predecessors. That flotation cost percentage is then applied to the expected dividend yields for the proxy group companies. As shown in Attachment AEB-11, the impact on the proxy group's cost of equity associated with Xcel Energy's historical flotation costs is 9 basis points (*i.e.*, 0.09 percent).

Q. DO YOUR COST OF EQUITY MODEL RESULTS REFLECT AN ADJUSTMENT FOR FLOTATION COST RECOVERY?

A. No, I do not make an explicit adjustment for flotation costs to any of the quantitative results of my cost of equity models. Rather, I have considered the incremental cost associated with stock issuance as part of my overall recommendation regarding the range of a reasonable ROE for the Company and the reasonableness of the Company's proposed ROE.

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[57] Shannon P. Pratt, *Cost of Capital Estimation and Applications*, Second Edition, at 220-21.

VII. REGULATORY AND BUSINESS RISKS

Q. DO THE RESULTS OF THE COST OF EQUITY ANALYSES ALONE PROVIDE AN APPROPRIATE ESTIMATE OF THE COST OF EQUITY FOR PUBLIC SERVICE?

A. No. The model results provide only a range of the appropriate estimate of Public Service's cost of equity. Several additional factors must be considered when determining the reasonableness of where the Company's cost of equity falls within the range of analytical results. These risk factors, discussed below, should be considered with respect to their overall effect on the Company's risk profile relative to the proxy group.

A. Regulatory Risks

Q. HOW DOES THE REGULATORY ENVIRONMENT AFFECT 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 service, the subject utility must have the opportunity to recover the return of, and the market-required return on, invested capital. Regulatory commissions recognize that because utility operations are capital intensive, regulatory decisions should enable the utility to attract capital at reasonable terms, and that doing so balances the long-term interests of investors and customers. Utilities must finance their operations and thus require the opportunity to earn a reasonable return on their invested capital to maintain their financial profiles. Public Service is no exception,

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

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

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

Q. DO CREDIT RATING AGENCIES CONSIDER REGULATORY RISK IN ESTABLISHING A COMPANY'S CREDIT RATING?

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

these criteria, regulatory framework and the ability to recover costs and earn returns are each given a broad rating factor of 25.00 percent. Therefore, Moody's assigns regulatory risk a 50.00 percent weighting in the overall assessment of business and financial risk for regulated utilities.[58]

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

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

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

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

[59] Standard & Poor's Global Ratings, Ratings Direct, U.S. and Canadian Regulatory Jurisdictions Support Utilities' Credit Quality – But Some More So Than Others, June 25, 2018, at 2.

[60] *Id*., at 1.

adapts to that environment are the most important credit considerations."[61] 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."[62]

Q. HAVE YOU CONDUCTED AN ANALYSIS OF THE REGULATORY FRAMEWORK IN COLORADO FOR PUBLIC SERVICE'S GAS DISTRIBUTION BUSINESS RELATIVE TO THE JURISDICTIONS IN WHICH THE COMPANIES IN YOUR PROXY GROUP OPERATE?

A. Yes. I have evaluated the regulatory framework in Colorado based on three factors that are important in terms of providing a regulated utility a reasonable opportunity to earn its authorized ROE: (1) test year convention (*i.e.*, forecast vs. historical); (2) use of rate design or other mechanisms that mitigate volumetric risk and stabilize revenue; and (3) prevalence of capital cost recovery between rate cases.

Q. WHAT ARE THE RESULTS OF YOUR ANALYSIS?

A. The results of my regulatory risk assessment are shown in Attachment AEB-10 and are summarized as follows:

> Test Year Convention: Public Service's rates are currently based on a historical test year with a year-end valuation of rate base, although Colorado statute allows for the use of a forecasted test year. Public Service is requesting in this proceeding that its rates be based on a 2023 Test Year ("Test Year") reflecting historical O&M costs through September 30, 2023

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

[62] *Id*.

with known and measurable adjustments, and actual capital plus forecasted capital costs for the twelve months ended December 31, 2023. By the time rates go into effect, the Test Year will be months in the past. As shown in Attachment AEB-10, approximately 46 percent of the utility operating subsidiaries of the natural gas utility proxy group companies use a partially or fully forecast test year, while the remainder use a historical test year.

Decoupling/Revenue Stabilization: Currently, Public Service's natural gas distribution business has a demand-side management ("DSM") adjustment clause that allows for recovery of lost revenues associated with customer participation in demand side management programs, but it does not currently have a separate revenue decoupling mechanism. However, in this proceeding, as discussed in the testimonies of Company witnesses Jason Peuquet and Ron Amen, the Company is proposing a Revenue Stability Mechanism. Approximately 87 percent of the utility operating subsidiaries of the natural gas utility proxy group companies have some form of revenue stabilization.

Capital Cost Recovery: Pursuant to a settlement agreement approved by the Commission in Proceeding No. 21A-0071G, Public Service's Pipeline System Integrity Adjustment ("PSIA") rider was terminated effective December 31, 2021, but the Company was allowed to defer 2022 PSIA costs for future recovery, with a return at the long-term cost of debt.[63] Accordingly, the Company does not have any mechanism for its natural gas business to address capital cost recovery between rate cases. In contrast, approximately 71 percent of the utility operating subsidiaries of the natural gas utility proxy group companies have some form of capital cost recovery mechanism for ratemaking purposes.

Q. IS THERE EVIDENCE THAT PUBLIC SERVICE HAS BEEN UNABLE TO EARN ITS AUTHORIZED RETURN ON EQUITY FOR THE GAS DISTRIBUTION BUSINESS?

A. Yes. As shown in Figure AEB-D-17, Public Service's natural gas distribution business has persistently and substantially earned less than its authorized ROE in every year since 2010. Over this period, the average earned ROE on the Company's natural gas distribution business has been over 177 basis points below

[63] Proceeding No. 21A-0071G, Decision No. C21-0715.

the Company's authorized ROE. This under-earning occurred despite the fact that Public Service was, until recently, allowed to recover interim capital investment through the PSIA rider on a more timely basis. While there are various reasons as to why a utility may not actually earn its authorized ROE, this data indicates that the Company has been unable to recover its prudently incurred costs on a timely basis.

Figure AEB-D-17:
Public Service's Earned vs. Authorized ROE for Its Gas Distribution Operations

	Earned ROE	Authorized ROE	Difference (bp)
2010	9.16%	10.25%	-109
2011	8.78%	10.10%	-132
2012	7.23%	10.10%	-287
2013	9.01%	9.72%	-71
2014	7.59%	9.72%	-213
2015	6.04%	9.50%	-346
2016	7.34%	9.50%	-216
2017	6.64%	9.50%	-286
2018	8.49%	9.35%	-86
2019	6.81%	9.35%	-254
2020	8.78%	9.20%	-42
2021	8.10%	9.20%	-110
2022	7.81%	9.20% - 9.50%	-139 to -169
Average	**7.83%**	**9.60%**	**-177**

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

A. Yes. In a recent research update on Public Service, S&P noted that the consistency within the ratemaking process in Colorado has weakened.[64] As

[64] S&P Global Ratings Direct, Research Update: Public Service Co. of Colorado Ratings Affirmed; Outlook Stable, July 5, 2023, at 1.

support for its position, S&P referenced the Commission's authorization of below average ROEs and capital structure parameters, and the Commission's reliance on policies that exacerbate regulatory lag, including the use of historical test periods when forecasted test periods are allowed by law.[65]

In addition, S&P stated:

> Furthermore, we believe that operating a natural gas system in Colorado continues to be challenging. The state's repeated interest in electrification is challenging the gas utility's growth prospects. We believe the heightened scrutiny of current and future systems may lower the predictability of investment recovery and increases the risk of stranded assets.[66]

Q. BASED ON THESE ANALYSES, WHAT IS YOUR CONCLUSION REGARDING THE LEVEL OF REGULATORY RISK FOR THE COMPANY'S GAS DISTRIBUTION BUSINESS RELATIVE TO THAT OF THE PROXY GROUP COMPANIES?

A. As discussed, the ratemaking conventions used to develop the Company's rates and the mechanism used for the recovery of its costs generally provide less regulatory certainty and timeliness of recovery relative to the majority of the utility operating subsidiaries of the proxy group companies. Therefore, in my view, Public Service has somewhat higher regulatory risk than the proxy group, which has been demonstrated through the inability of Public Service to earn its authorized ROE for its gas distribution business and supports an authorized ROE above the median or mean results of the proxy group.

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[65] *Id*., at 4-5.

[66] *Id*., at 5.

J. Impact of Colorado GHG Emissions Reduction Initiatives

Q. HAS COLORADO ENACTED LEGISLATION THAT INCREASES THE BUSINESS RISK OF THE COMPANY GOING FORWARD?

A. Yes. As also discussed by Company witness Paul A. Johnson, Colorado has enacted, and recently updated, legislation to reduce GHG emissions economy-wide throughout the state through House Bill ("HB") 19-1261 and Senate Bill ("SB") 23-016. Moreover, the General Assembly has enacted various legislation that addresses GHG reductions in specific sectors, including natural gas utilities. Specifically, this legislation includes:

- SB 21-264, which requires, among other things, that gas distribution utilities in Colorado file Clean Heat Plans to reduce GHG emissions from both utility operations and end-use customer consumption.
- HB 21-1238, which modernizes gas demand side management programs, including the metrics used to determine their cost-effectiveness and "more realistically account for their value."
- HB 21-1286, which requires a building task force to be convened that will recommend building performance standards to achieve a reduction in GHGs for buildings of 7.0 percent by 2026 and 20.0 percent by 2030 relative to 2021 levels.

The Commission has established rules implementing SB 21-264 and HB 21-1238, and in fact, as explained in more detail by Company witness Mr. Martz, the Commission has overhauled the regulatory framework for natural gas utilities by adopting a new suite of gas rules ("New Gas Rules"), addressing not only Clean Heat Plans and DSM as required by the legislation, but also enacted new requirements associated with certificates of public convenience and necessity ("CPCNs"), gas infrastructure plans ("GIPs"), and line extensions, among other

topics. Moreover, building performance standards have been adopted by the Air Quality Control Commission.[67]

Q. IN ADDITION TO THE LEGISLATION AND REGULATORY IMPLEMENTATION OF THIS LEGISLATION JUST DESCRIBED, DID OTHER RELEVANT LEGISLATION PASS IN THE 2023 LEGISLATIVE SESSION?

A. Yes. SB 23-291 enacted in August 2023 requires, among other things, (1) utilities to file a gas price risk management plan to levelize or mitigate fuel price volatility; and (2) the Commission to develop rules regarding mechanisms to align the financial incentives of the utility with customers (essentially a fuel cost risk-sharing mechanism). It also itemizes unavoidable costs of doing business that Public Service will not be allowed to recover. In addition, SB23-291 prohibits a natural gas utility from providing an applicant for natural gas service any incentive, including a line extension allowance. For a utility that offers its customers both natural gas and electric service, SB 23-291 states that the Commission may require such dual-fuel utilities to provide its customers with information regarding the options for switching from natural gas to high-efficiency electric space heating or water heating and a list of appliances for which the utility provides incentives or rebates.

[67] *See, e.g.*, Joe Burns, "Colorado mandates new building energy performance standards despite criticism," Facilities Dive, August 22, 2023.

Q. MOVING BACK TO THE EMISSIONS REDUCTION REQUIREMENTS FOR NATURAL GAS UTILITIES, WHAT ARE THE GHG EMISSIONS REDUCTION TARGETS SPECIFIED IN SB 21-264?

A. The statute specifies targets for reductions in GHG emissions, relative to a 2015 baseline, of 4.0 percent in 2025 and 22.0 percent in 2030. The reduction targets for 2035 will be determined by the Commission no later than December 1, 2024, and the Commission is to establish the targets for 2040, 2045 and 2050 no later than December 1, 2032.

Q. HAS THE COMMISSION ADOPTED THE RULES NECESSARY FOR NATURAL GAS DISTRIBUTION UTILITIES TO IMPLEMENT CLEAN HEAT PLANS?

A. Yes. The Clean Heat Plan-related rules are part of the New Gas Rules, which include a suite of other requirements. One specific requirement worth noting again is the GIP rules as part of the New Gas Rules, which are designed to enhance the visibility into a gas utility's future projects and expenditures to provide greater transparency into the cumulative future capital investments in natural gas infrastructure. These new rules include requiring the Company, as the largest gas utility in Colorado, to obtain a certificate of public convenience and necessity for capital projects over $12 million.[68]

Q. HAS THE COMPANY FILED ITS CLEAN HEAT PLAN?

A. Yes. The Company filed its Clean Heat plan on August 1, 2023, and the case is still pending. The Company has put forward four different portfolios with different

[68] *See* Rule 4102(b) (requiring a CPCN for certain projects with a total utility capital investment value of over $12 million in 2020 dollars unless approval is obtained under Rule 4555(c)).

combinations of beneficial electrification, DSM, recovered methane, and hydrogen.[69] The Company's statutorily required "preferred option" is its Amended Preferred Portfolio, which maximizes use of the measures described above while managing bill impacts to customers.

Q. HAS COLORADO ALSO RECENTLY ADJUSTED ITS ECONOMY-WIDE EMISSIONS REDUCTION GOALS THAT WILL AFFECT THE LONG-TERM USE OF NATURAL GAS IN COLORADO?

A. Yes. As noted, SB23-016 was enacted into law in the 2023 legislative session, and created a net-zero GHG statewide emissions reduction goal for 2050, with interim goals to be reached in 2035 and each five years thereafter through 2050. As the Company has stated, while the Clean Heat targets from SB21-264 for 2025 and 2030 are unaffected by the goals set forth in SB23-016, and the statewide goals in SB23-016 are not specifically binding on the Company's natural gas operations, the new statewide goals established in SB23-016 nonetheless inform and clarify the long-term economy-wide future in Colorado and, thus the must also inform the Clean Heat planning process, the Commission's future Clean Heat goals, and thus the future of the Company's natural gas system.[70]

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[69] Public Utilities Commission of Colorado, Additional Supplemental Direct Testimony and Attachments of Jack W. Ihle, Proceeding No. 23A-0392EG, November 6, 2023, at 13.

[70] Public Utilities Commission of Colorado, Direct Testimony and Attachments of Jack W. Ihle, Proceeding No. 23A-0392EG, August 1, 2023, at 22.

Q. HAS THE COMPANY INDICATED HOW IT ENVISIONS THE POTENTIAL FUTURE OF ITS NATURAL GAS UTILITY BUSINESS GIVEN COLORADO'S VISION FOR A CLEAN ENERGY FUTURE?

A. Yes. The Company's inaugural Clean Heat Plan models different futures for the natural gas system out to 2050, with pathways focused on electrification and others using a combination of clean fuels and electrification. These long-term analyses are illustrative in nature, and the Company has stated in its Clean Heat Plan that the impacts of emissions reductions on the end state of its natural gas utility operations are unclear. The Company also states that it does not currently have a preference as to one long-term scenario versus another, but further discussion and analysis is required to address the complex legal, regulatory, and social issues concerning the future of Colorado's energy landscape. However, as the Company has acknowledged, one potential future outcome may be where Colorado invests heavily in achieving an all-electric or nearly all-electric future and the Company would either no longer operate a natural gas distribution utility, or if so, on a significantly more limited basis as a 100 percent clean system or for certain industries and uses for which electrification is not possible:

> Given the statewide 2050 goal, the Clean Heat planning process, and the Company's own Net-Zero Vision, we believe there are fundamentally two competing visions for the future of the Company's gas LDC, although there are potentially variations in between. In one world, we begin to make investments to transform our LDC system fuel sources, while also continuing to make fundamental investments for safety and reliability reasons. A gas system remains in place in 2050, but with lower throughout and using a mix of molecules from different and cleaner sources. The Company pursues a suite of options that balance customer costs and the maximum practicable progress toward net-zero emissions. In another world, we move

> toward full electrification, and assist our customers with a transition to all-electric heating, cooking, and industrial production - and prepare for a future in 2050 where the gas system is significantly substantially [sic] smaller and may not exist.[71]

Q. DOES RECENTLY ENACTED LEGISLATION INCREASE THE COMPANY'S BUSINESS RISK GOING FORWARD?

A. Yes. Regardless of the ultimate end state in 2050 of the Company's natural gas utility operations, a few factors are clear: (1) there is currently significant uncertainty associated with the future of the Company's natural gas system and how or to what extent the Clean Heat Plan requirements will affect the Company's operations going forward; (2) the Company's natural gas operations are expected to be significantly smaller regardless of the ultimate end state in 2050; and (3) the risk exists that the Company's natural gas utility operations may be eliminated entirely.

Q. HAVE COMMUNITIES WITHIN THE COMPANY'S SERVICE TERRITORY ALSO ADJUSTED BUILDING CODES TO REDUCE OR ELIMINATE THE USE OF NATURAL GAS?

A. Yes. For example, the City and County of Denver, Colorado, the largest metropolitan area served by Public Service, has committed to eliminate GHG emissions by 2040, with a goal that all new buildings and homes will be net zero energy by 2030 and all existing homes will be net zero energy by 2040. As part of its emissions reduction goals, in January 2023, Denver imposed a ban on natural

[71] Public Utilities Commission of Colorado, Direct Testimony and Attachments of Jack W. Ihle, Proceeding No. 23A-0392EG, August 1, 2023, at 24.

gas furnaces and water heaters in new commercial and multi-family construction starting in 2024, and that natural gas will not be permitted for any heating or cooling equipment in new commercial buildings starting in 2027.

Q. HOW DO THE RISKS FACED BY THE COMPANY GOING FORWARD ASSOCIATED WITH COLORADO'S CLEAN ENERGY FUTURE COMPARE TO OTHER STATES AND JURISDICTIONS IN WHICH THE UTILITY OPERATING SUBSIDIARIES OF THE PROXY GROUP COMPANIES OPERATE?

A. Comparatively, Colorado has implemented more aggressive decarbonization programs that create greater business risk to natural gas utility service than the proxy group companies overall face with respect to decarbonization.[72] In fact, the utility operating subsidiaries of the proxy group companies operate in 16 distinct states, 11 of which have expressly prohibited natural gas bans and 3 that have proposed legislation to prohibit natural gas bans.[73] Likewise, 11 of the 16 states do not have statutory GHG reduction targets or requirements.[74] Therefore, Colorado has greater operating risk for natural gas utilities than the regulatory jurisdictions in which the natural gas proxy group companies operate.

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[72] *See, e.g.*, Scott Weiser, "Denver imposes natural gas ban on heating, cooling equipment in commercial buildings, multi-family housing," Denver Gazette, February 27, 2023. Atmos Energy Corporation, which is included in the natural gas utility proxy group, has operations in numerous jurisdictions, one of which is Colorado; however, none of the other proxy group companies have natural gas operations in Colorado.

[73] Tom DiChristopher, "Gas Ban Monitor: 1st Mass. Bans advance amid broader New England push," S&P Global Market Intelligence, November 8, 2023.

[74] National Conference of State Legislatures, Greenhouse Gas Emissions Reduction Targets and Market-based Policies (https://www.ncsl.org/research/energy/greenhouse-gas-emissions-reduction-targets-and-market-based-policies.aspx; updated as of September 5, 2023); Center of Climate and Energy Solutions, U.S. State Greenhouse Gas Emissions Targets (https://www.c2es.org/document/greenhouse-gas-emissions-targets/; updated as of September 2023).

Q. WHAT ARE YOUR OVERALL CONCLUSIONS REGARDING THE COMPANY'S BUSINESS RISKS RELATED TO GHG EMISSION REDUCTION INITIATIVES IN COLORADO?

A. Colorado has enacted numerous laws and initiatives to reduce GHG emissions at the LDC level, including from end-use customer consumption, and similar initiatives do not exist in the vast majority of the states in which the natural gas utilities in proxy group operate. Although the ultimate future effect on the Company's natural gas utility operations is not yet known as a result of implementing and achieving the GHG reduction requirements, the Company's natural gas distribution business is nonetheless exposed to significant uncertainty regarding the energy transition in Colorado, including the timing of and financial ramifications to the Company of such a transition. Therefore, based on this information, it is reasonable that investors would consider Public Service to have significantly greater business risk going forward regarding the effect of GHG reduction requirements to its natural gas utility operations as compared to the proxy group.

K. <u>Commodity Cost Price Risk</u>

Q. DOES SB23-291, WHICH YOU DISCUSSED PREVIOUSLY, INCREASE THE BUSINESS RISK OF THE COMPANY GOING FORWARD RELATED TO THE RECOVERY OF COMMODITY COSTS?

A. Yes. SB23-291 has two specific requirements related to commodity costs, which are summarized in a recent Commission decision (Decision No. C23-0670 in Proceeding No. 23M-0493EG):

> The new statute requires the four Colorado investor-owned gas utilities to file, on or before November 1, 2023, a gas price risk management plan (GPRMP) that includes proposals for leveling or reducing the volatility of fuel costs that are recovered pursuant to the utility's Gas Cost Adjustment (GCA) filings. The new statute also requires the Commission to adopt new or modified rules, on or before January 1, 2025, governing each gas utility's GCA and each investor-owned electric utility's rate adjustment mechanism used for fuel-cost recovery for the purpose of aligning the financial incentives of the utility with the interests of its customers.[75]

Q. HAS THE COMPANY FILED A GAS PRICE RISK MITIGATION PLAN ("GPRM PLAN") IN ACCORDANCE WITH THE FIRST REFERENCED REQUIREMENT UNDER SB23-291?

A. Yes. On October 31, 2023, Public Service filed an application requesting Commission approval of its 2024 GPRM Plan, which was thereafter slightly amended. The 2024 GPRM Plan included proposals for leveling or reducing the volatility of fuel costs that are recovered pursuant to the utility's gas cost adjustment ("GCA") filings. The plan protects customers from significant market volatility by setting upper and lower bounds within which the GCA rate may fluctuate, subject to certain parameters, with differences deferred for future recovery. On November 30, 2023, the Commission granted Public Service's Amended 2024 GPRM Plan.

Q. HAS THE COMMISSION INITIATED A PROCEEDING WITH RESPECT TO THE SECOND REQUIREMENT?

A. Yes. Section 4 of SB23-291 requires the Commission to adopt rules on or before January 1, 2025 that will help protect gas utility customers from gas price volatility

[75] Proceeding No. 23M-0493EG, Decision No. C23-0670, at ¶ 1.

by "establish mechanisms to align the financial incentives of an investor-owned electric or gas utility with the interests of the utility's customers regarding incurred fuel costs."[76] The legislation states that, when adopting the rules, the Commission shall consider symmetrically allocating an amount of fuel price risk to the gas utility subject to including a range of outcomes within which no risk-sharing occurs and there is a cap on any incentive or cost sharing that results from the risk-mitigation mechanism.[77] The Company filed initial comments on December 1, 2023, and it is my understanding that the Company expects a formal rulemaking to follow to meet the directives of Section 4 of SB23-291.

Q. HOW DOES THE CHANGE IN GAS COST RECOVERY RESULTING FROM SB23-291 AFFECT THE COMPANY'S BUSINESS RISK RELATIVE TO THE PROXY GROUP?

A. While the specific rules have not yet been approved by the Commission regarding the sharing of gas costs, the fact that the legislation instructs the Commission to consider sharing mechanisms for the recovery of gas costs increases Public Service's business risk relative to the proxy group. Additionally, as noted previously, the Company is also subject to absorbing and deferring the recovery of gas costs outside the bounds set forth in the Amended 2024 GPRM Plan.

[76] CRS 40-3-120(2)(b).

[77] CRS 40-3-120(3)(a).

VIII. CAPITAL STRUCTURE

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

A. Yes. The equity ratio is the primary indicator of financial risk for a regulated utility. All else equal, a higher debt ratio increases the risk to investors. For debt holders, higher debt ratios result in a greater portion of the available cash flow being required to meet debt service, thereby increasing the risk associated with the payments on debt. The result of increased risk is a higher interest rate. The incremental risk of a higher debt ratio is more significant for common equity shareholders, whose claim on the cash flow of the Company is secondary to debt holders. Therefore, the greater the debt service requirement, the less cash flow is available for common equity holders.

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

A. As discussed in the Direct Testimony of Company witness Paul A. Johnson, Public Service is proposing a capital structure as of December 31, 2023 that is composed of 55.0 percent common equity, 43.18 percent long-term debt, and 1.82 percent short-term debt.

Q. DID YOU CONDUCT AN ANALYSIS TO ASSESS THE REASONABLENESS OF THE REQUESTED EQUITY RATIO?

A. Yes. I compared the Company's proposed capital structure relative to the actual capital structures of the utility operating subsidiaries of the companies in the proxy group. The cost of equity is estimated based on the return that is derived from companies in the proxy group that are deemed to be comparable in risk to the

Company; however, those companies must be publicly-traded in order to apply the cost of equity models. The operating utility subsidiaries of the proxy group companies are most risk-comparable to the Company, and thus it is reasonable to look to the average capital structure of the operating utilities of the proxy group to benchmark the equity ratios for the Company. Specifically, I have calculated the average proportion of common equity, long-term debt, preferred equity and short-term debt for the most recent three years for each of the utility operating subsidiaries of the proxy group companies. As shown in Attachment AEB-12, the equity ratios for the utility operating subsidiaries of the natural gas utility proxy group range from 44.57 percent to 59.79 percent. Similarly, the equity ratios for the utility operating subsidiaries of the combination utility proxy group range from 47.62 percent to 59.55 percent. As such, Public Service's proposed equity ratio of 55.00 percent is well within the range of equity ratios of both proxy groups.

Q. IN YOUR EXPERIENCE, IS AUTHORIZING A RANGE OF CAPITAL STRUCTURE OR ROES, AS OPPOSED TO A REASONABLE DATA POINT ESTIMATE, TYPICAL?

A. No. As noted previously, in my experience, regulatory commissions typically authorize a point estimate of each of the components of the weighted average cost of capital for ratemaking purposes (*i.e.*, the ROE, cost of debt, the equity ratio, and the debt ratio).

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

A. Yes, there are other factors that should be considered in setting the Company's capital structure – namely the challenges that the credit rating agencies have highlighted as placing pressure on the credit metrics for utilities.

For example, while Moody's recently revised its outlook for the utility sector from "negative" to "stable", Moody's continues to note that high interest rates and increased capital spending will place pressure on credit metrics. Thus, Moody's highlights constructive regulatory outcomes that promote timely cost recovery as a key factor in supporting utility credit quality.[78]

Likewise, while S&P also recently revised its outlook for the industry from negative to stable,[79] S&P continues to see significant risks in 2024 for the industry as a result of, among other things, inflation and increased levels of capital spending, and specifically full electrification and natural gas bans for natural gas utilities.[80] S&P also recently found that the factors contributing to higher costs (*e.g.*, inflation; deferred commodity costs) and that it will be closely monitoring pressure on the industry's credit quality as a result of its ability to recover these

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

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

[80] S&P Global Ratings, Industry Credit Outlook 2024 - North American Regulated Utilities, January 9, 2024.

costs on a timely basis and minimize regulatory lag, while at the same time effectively managing regulatory risk and customer rates. [81]

Fitch Ratings ("Fitch") has stated that it is maintaining a "deteriorating outlook" on the U.S. utility sector in 2024 based on elevated capital spending and continuing higher interest rates that place pressure on credit metrics. Fitch noted that bill affordability will remain a major issue for the industry that could affect future regulatory outcomes, and that while it expects authorized ROEs to start trending up with the increase in interest rates, albeit with a lag, given the uncertain macroeconomic environment and bill pressure on customers, the lag could be longer than in previous cycles.[82]

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

Q. WILL THE CAPITAL STRUCTURE AND ROE AUTHORIZED IN THIS PROCEEDING 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 its operations with internally generated funds. Both bond investors and rating agencies expect a significant portion of ongoing capital

[81] S&P Global Ratings, "Regulatory Friction Is Constraining Cost Recovery For North American Investor-Owned Utilities," November 6, 2023, at 8.

[82] FitchRatings, "North American Utilities, Power & Gas Outlook," S&P Market Intelligence, November 13, 2023.

investments to be financed with internally-generated funds. In addition, it is important to recognize that because a utility's investment horizon is very long, investors require the assurance of a sufficiently high return to satisfy the long-term 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, particularly given the capital market conditions discussed previously.

Q. DID YOU ALSO EVALUATE THE COMPANY'S PROPOSED SHORT-TERM DEBT RATIO?

A. Yes. As shown on Attachment AEB-12, the short-term debt ratios for the utility operating subsidiaries of the natural gas utility proxy group range from 0.00 percent to 11.47 percent, with an average of 4.26 percent. The short-term debt ratios for the utility operating subsidiaries of the combination utility proxy group range from 0.00 percent to 6.53 percent, with an average of 2.60 percent. Thus, Public Service's proposed short-term debt ratio of 1.82 percent is well within the range of short-term debt ratios of both proxy groups.

IX. CONCLUSIONS AND RECOMMENDATION

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

A. As shown in in Figure AEB-D-18 and Figure AEB-D-19, the ranges of the cost of equity results using the natural gas utility proxy group or the combination utility proxy group overlap and indicate an increase in the cost of equity from the Company's last natural gas rate proceeding. Based on these quantitative analyses, a reasonable range of ROE results for Public Service is from 10.25 percent to 11.25 percent. Considering the qualitative analyses presented in my direct testimony, and the Company's specific risk factors, it would be appropriate to establish an ROE, or an ROE range for ratemaking purposes such as the Commission has done previously, that is above the midpoint of this range. However, despite the significant increase in the cost of equity as compared to the Company's last rate proceeding, the Company is requesting an ROE of 10.25 percent, which is at the low-end of the range and is consistent with its request in a lower capital cost environment.

Figure AEB-D-18:
Summary of Analytical Results Natural Gas Utility Proxy Group

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.89%	10.84%	12.02%
90-Day Avg. Stock Price	9.72%	10.67%	11.85%
180-Day Avg. Stock Price	9.53%	10.48%	11.66%
Average	9.72%	10.66%	11.84%
Median Results:			
30-Day Avg. Stock Price	10.03%	10.30%	11.92%
90-Day Avg. Stock Price	9.97%	10.24%	11.70%
180-Day Avg. Stock Price	9.95%	10.22%	11.38%
Average	9.98%	10.25%	11.67%

Multi-Stage DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	10.06%	10.32%	10.67%
90-Day Avg. Stock Price	9.88%	10.14%	10.47%
180-Day Avg. Stock Price	9.68%	9.93%	10.25%
Average	9.87%	10.13%	10.46%
Median Results:			
30-Day Avg. Stock Price	10.16%	10.47%	10.80%
90-Day Avg. Stock Price	10.08%	10.39%	10.71%
180-Day Avg. Stock Price	9.85%	10.27%	10.60%
Average	10.03%	10.37%	10.70%

CAPM / ECAPM / Bond Yield Risk Premium

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.47%	11.43%	11.37%
Current Bloomberg Beta	10.72%	10.65%	10.56%
Long-term Avg. *Value Line* Beta	10.43%	10.35%	10.25%
ECAPM:			
Current *Value Line* Beta	11.74%	11.71%	11.67%
Current Bloomberg Beta	11.18%	11.13%	11.06%
Long-term Avg. *Value Line* Beta	10.96%	10.90%	10.83%
Bond Yield Risk Premium	10.63%	10.46%	10.25%

Figure AEB-D-19:
Summary of Analytical Results Combination Utility Proxy Group

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.62%	10.30%	10.92%
90-Day Avg. Stock Price	9.58%	10.26%	10.88%
180-Day Avg. Stock Price	9.41%	10.08%	10.71%
Average	9.54%	10.21%	10.84%
Median Results:			
30-Day Avg. Stock Price	9.66%	9.97%	10.93%
90-Day Avg. Stock Price	9.59%	9.95%	10.88%
180-Day Avg. Stock Price	9.45%	9.86%	10.62%
Average	9.57%	9.93%	10.81%

Multi-Stage DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.77%	9.94%	10.10%
90-Day Avg. Stock Price	9.73%	9.89%	10.05%
180-Day Avg. Stock Price	9.53%	9.70%	9.85%
Average	9.68%	9.84%	10.00%
Median Results:			
30-Day Avg. Stock Price	9.62%	9.87%	10.08%
90-Day Avg. Stock Price	9.60%	9.87%	10.09%
180-Day Avg. Stock Price	9.48%	9.77%	9.99%
Average	9.57%	9.84%	10.05%

CAPM / ECAPM / Bond Yield Risk Premium

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.44%	11.40%	11.34%
Current Bloomberg Beta	10.73%	10.66%	10.57%
Long-term Avg. *Value Line* Beta	10.30%	10.22%	10.11%
ECAPM:			
Current *Value Line* Beta	11.72%	11.69%	11.64%
Current Bloomberg Beta	11.19%	11.14%	11.07%
Long-term Avg. *Value Line* Beta	10.87%	10.80%	10.72%
Bond Yield Risk Premium	10.79%	10.62%	10.40%

Q. WHAT IS YOUR CONCLUSION WITH RESPECT TO PUBLIC SERVICE'S REQUESTED CAPITAL STRUCTURE?

A. The Company's proposed equity and short-term debt ratios are well within the range of those ratios in the actual capital structures of the operating utility subsidiaries of both proxy groups. Further, taking into consideration the impact of current and projected market conditions on the cash flows of utilities as raised by the credit rating agencies, I conclude that the Company's proposal is reasonable and should be adopted for ratemaking purposes, I conclude that the Company's proposed capital structure is reasonable for ratemaking purposes.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * * *

IN THE MATTER OF ADVICE NO. 1029-GAS OF PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 6-GAS TARIFF TO INCREASE JURISDICTIONAL BASE RATE REVENUES, IMPLEMENT NEW BASE RATES FOR ALL GAS RATE SCHEDULES, AND MAKE OTHER PROPOSED TARIFF CHANGES EFFECTIVE FEBRUARY 29, 2024	)	**PROCEEDING NO. 24AL-_____G**

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

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

Dated at Boston, Massachusetts, this 22nd day of January, 2024.

Ann E. Bulkley
Principal at The Brattle Group

Subscribed and sworn to before me this 22ND day of January, 2024.

Notary Public

My Commission expires 6/30/2028

GERARD M. ROONEY NOTARY PUBLIC MY COMMISSION EXPIRES 6-30-2028 COMMONWEALTH OF MASSACHUSETTS

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

Ann E. Bulkley

PRINCIPAL

Boston 508.981.0866 Ann.Bulkley@brattle.com

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

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

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

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

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

AREAS OF EXPERTISE

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

EDUCATION

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

PROFESSIONAL EXPERIENCE

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

SELECTED CONSULTING EXPERIENCE & EXPERT TESTIMONY

REGULATORY ANALYSIS AND RATEMAKING

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

- Cost of capital and return on equity testimony, cost of service and rate design analysis and testimony, development of ratemaking strategies
- Development of merchant function exit strategies

- Analysis and program development to address residual energy supply and/or provider of last resort obligations
- Stranded costs assessment and recovery
  Performance-based ratemaking analysis and design
- Many aspects of traditional utility ratemaking (e.g., rate design, rate base valuation)

COST OF CAPITAL

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

RATEMAKING

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

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

VALUATION

Have provided valuation services to utility clients, unregulated generators, and private equity clients for a variety of purposes, including ratemaking, fair value, ad valorem tax, litigation and damages, and acquisition. Appraisal practices are consistent with the national standards established by the Uniform Standards of Professional Appraisal Practice.

Representative projects/clients have included:

- Prepared appraisals of electric utility transmission and distribution assets for ad valorem tax purposes.
- Prepared appraisals of hydroelectric generating facilities for ad valorem tax purposes.
- Conducted appraisals of fossil fuel generating facilities for ad valorem tax purposes.
- Conducted appraisals of generating assets for the purposes of unwinding sale-leaseback agreements.
- For a confidential utility client, prepared valuation of fossil and nuclear generation assets for financing purposes for regulated utility client.

- Conducted a strategic review of the acquisition of nuclear generation assets. Review included the evaluation of the operating costs of the facilities and the long-term liabilities associated with the assets including the decommissioning of the assets.
- Prepared a valuation of a portfolio of generation assets for a large energy utility to be used for strategic planning purposes. Valuation approach included an income approach, a real options analysis, and a risk analysis.
- Assisted clients in the restructuring of NUG contracts through the valuation of the underlying assets. Performed analysis to determine the option value of a plant in a competitively priced electricity market following the settlement of the NUG contract.
- Prepared market valuations of several purchase power contracts for large electric utilities in the sale of purchase power contracts. Assignment included an assessment of the regional power market, analysis of the underlying purchase power contracts, and a traditional discounted cash flow valuation approach, as well as a risk analysis. Analyzed bids from potential acquirers using income and risk analysis approached. Prepared an assessment of the credit issues and value at risk for the selling utility.
- Prepared appraisal of a portfolio of generating facilities for a large electric utility to be used for financing purposes.
- Conducted a valuation of regulated utility assets for the fair value rate base estimate used in electric rate proceedings in Indiana.
- Prepared an appraisal of a fleet of fossil generating assets for a large electric utility to establish the value of assets transferred from utility property.
- Conducted due diligence on an electric transmission and distribution system as part of a buy-side due diligence team.
- Provided analytical support and prepared testimony regarding the valuation of electric distribution system assets in five communities in a condemnation proceeding.
- Prepared feasibility reports analyzing the expected net benefits resulting from municipal ownership of investor-owned utility operations.
- Prepared independent analyses of proposal for the proposed government condemnation of the investor-owned utilities in Maine and the formation of a public power district.
- Valued purchase power agreements in the transfer of assets to a deregulated electric market.

STRATEGIC AND FINANCIAL ADVISORY SERVICES

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

Representative projects include:

- Preparation of feasibility studies for bond issuances for municipal and district steam clients.
- Assisted in the development of a generation strategy for an electric utility. Analyzed various NERC regions to identify potential market entry points. Evaluated potential competitors and alliance partners. Assisted in the development of gas and electric price forecasts. Developed a framework for the implementation of a risk management program.
- Assisted clients in identifying potential joint venture opportunities and alliance partners. Contacted interviewed and evaluated potential alliance candidates based on company-established criteria for several LDCs and marketing companies. Worked with several LDCs and unregulated marketing companies to establish alliances to enter into the retail energy market. Prepared testimony in support of several merger cases and participated in the regulatory process to obtain approval for these mergers.
- Assisted clients in several buy-side due diligence efforts, providing regulatory insight and developing valuation recommendations for acquisitions of both electric and gas properties.

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BULKLEY TESTIMONY LISTING

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Arizona Corporation Commission				
UNS Electric	11/22	UNS Electric	Docket No. E-04204A-15-0251	Return on Equity
Tucson Electric Power Company	6/22	Tucson Electric Power Company	Docket No. G-01933A-22-0107	Return on Equity
Southwest Gas Corporation	12/21	Southwest Gas Corporation	Docket No. G-01551A-21-0368	Return on Equity
Arizona Public Service Company	10/19	Arizona Public Service Company	Docket No. E-01345A-19-0236	Return on Equity
Tucson Electric Power Company	04/19	Tucson Electric Power Company	Docket No. E-01933A-19-0028	Return on Equity
Tucson Electric Power Company	11/15	Tucson Electric Power Company	Docket No. E-01933A-15-0322	Return on Equity
UNS Electric	05/15	UNS Electric	Docket No. E-04204A-15-0142	Return on Equity
UNS Electric	12/12	UNS Electric	Docket No. E-04204A-12-0504	Return on Equity
Arkansas Public Service Commission				
Oklahoma Gas and Electric Co	10/21	Oklahoma Gas and Electric Co	Docket No. D-18-046-FR	Return on Equity
Arkansas Oklahoma Gas Corporation	10/13	Arkansas Oklahoma Gas Corporation	Docket No. 13-078-U	Return on Equity
California Public Utilities Commission				
PacifiCorp, d/b/a Pacific Power	5/22	PacifiCorp, d/b/a Pacific Power	Docket No. A-22-05-006	Return on Equity
San Jose Water Company	05/21	San Jose Water Company	A2105004	Return on Equity

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Colorado Public Utilities Commission				
Public Service Company of Colorado	11/22	Public Service Company of Colorado	Docket No. 22AL-0530E	Return on Equity
Public Service Company of Colorado	01/22	Public Service Company of Colorado	Docket No. 22AL-0046G	Return on Equity
Public Service Company of Colorado	07/21	Public Service Company of Colorado	21AL-0317E	Return on Equity
Public Service Company of Colorado	02/20	Public Service Company of Colorado	20AL-0049G	Return on Equity
Public Service Company of Colorado	05/19	Public Service Company of Colorado	19AL-0268E	Return on Equity
Public Service Company of Colorado	01/19	Public Service Company of Colorado	19AL-0063ST	Return on Equity
Atmos Energy Corporation	05/15	Atmos Energy Corporation	Docket No. 15AL-0299G	Return on Equity
Atmos Energy Corporation	04/14	Atmos Energy Corporation	Docket No. 14AL-0300G	Return on Equity
Atmos Energy Corporation	05/13	Atmos Energy Corporation	Docket No. 13AL-0496G	Return on Equity
Connecticut Public Utilities Regulatory Authority				
The Southern Connecticut Gas Company	11/23	The Southern Connecticut Gas Company	Docket No. 23-11-02	Return on Equity
Connecticut Natural Gas Corporation	11/23	Connecticut Natural Gas Corporation	Docket No. 23-11-02	Return on Equity
Connecticut Water Company	10/23	Connecticut Water Company	Docket No. 23-08-32	Return on Equity
United Illuminating	09/22	United Illuminating	Docket No. 22-08-08	Return on Equity
United Illuminating	05/21	United Illuminating	Docket No. 17-12-03RE11	Return on Equity

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Connecticut Water Company	01/21	Connecticut Water Company	Docket No. 20-12-30	Return on Equity
Connecticut Natural Gas Corporation	06/18	Connecticut Natural Gas Corporation	Docket No. 18-05-16	Return on Equity
Yankee Gas Services Co. d/b/a Eversource Energy	06/18	Yankee Gas Services Co. d/b/a Eversource Energy	Docket No. 18-05-10	Return on Equity
The Southern Connecticut Gas Company	06/17	The Southern Connecticut Gas Company	Docket No. 17-05-42	Return on Equity
The United Illuminating Company	07/16	The United Illuminating Company	Docket No. 16-06-04	Return on Equity
Federal Energy Regulatory Commission				
Sea Robin Pipeline	12/22	Sea Robin Pipeline	Docket No. RP22-___	Return on Equity
Northern Natural Gas Company	07/22	Northern Natural Gas Company	Docket No. RP22-___	Return on Equity
Transwestern Pipeline Company, LLC	07/22	Transwestern Pipeline Company, LLC	Docket No. RP22-___	Return on Equity
Florida Gas Transmission	02/21	Florida Gas Transmission	Docket No. RP21-441	Return on Equity
TransCanyon	01/21	TransCanyon	Docket No. ER21-1065	Return on Equity
Duke Energy	12/20	Duke Energy	Docket No. EL21-9-000	Return on Equity
Wisconsin Electric Power Company	08/20	Wisconsin Electric Power Company	Docket No. EL20-57-000	Return on Equity
Panhandle Eastern Pipe Line Company, LP	10/19	Panhandle Eastern Pipe Line Company, LP	Docket Nos. RP19-78-000 RP19-78-001	Return on Equity
Panhandle Eastern Pipe Line Company, LP	08/19	Panhandle Eastern Pipe Line Company, LP	Docket Nos. RP19-1523	Return on Equity

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Sea Robin Pipeline Company LLC	11/18	Sea Robin Pipeline Company LLC	Docket# RP19-352-000	Return on Equity
Tallgrass Interstate Gas Transmission	10/15	Tallgrass Interstate Gas Transmission	RP16-137	Return on Equity
Idaho Public Utilities Commission				
Intermountain Gas Co	12/22	Intermountain Gas Co	C-INT-G-22-07	Return on Equity
PacifiCorp d/b/a Rocky Mountain Power	05/21	PacifiCorp d/b/a Rocky Mountain Power	Case No. PAC-E-21-07	Return on Equity
Illinois Commerce Commission				
Peoples Gas Light & Coke Company	01/23	Peoples Gas Light & Coke Company	D-23-0069	Return on Equity
North Shore Gas Company	01/23	North Shore Gas Company	D-23-0068	Return on Equity
Illinois American Water	02/22	Illinois American Water	Docket No. 22-0210	Return on Equity
North Shore Gas Company	02/21	North Shore Gas Company	No. 20-0810	Return on Equity
Indiana Utility Regulatory Commission				
Southern Indiana Gas and Electric Company d/b/a CenterPoint Energy Indiana South	12/23	Southern Indiana Gas and Electric Company d/b/a CenterPoint Energy Indiana South	IURC Cause No. 45990	Return on Equity
Indiana Michigan Power Co.	08/23	Indiana Michigan Power Co.	IURC Cause No. 45933	Return on Equity
Indiana American Water Company	03/23	Indiana and Michigan American Water Company	IURC Cause No. 45870	Return on Equity
Indiana Michigan Power Co.	07/21	Indiana Michigan Power Co.	IURC Cause No. 45576	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Indiana Gas Company Inc.	12/20	Indiana Gas Company Inc.	IURC Cause No. 45468	Return on Equity
Southern Indiana Gas and Electric Company	10/20	Southern Indiana Gas and Electric Company	IURC Cause No. 45447	Return on Equity
Indiana and Michigan American Water Company	09/18	Indiana and Michigan American Water Company	IURC Cause No. 45142	Return on Equity
Indianapolis Power and Light Company	12/17	Indianapolis Power and Light Company	Cause No. 45029	Fair Value
Northern Indiana Public Service Company	09/17	Northern Indiana Public Service Company	Cause No. 44988	Fair Value
Indianapolis Power and Light Company	12/16	Indianapolis Power and Light Company	Cause No.44893	Fair Value
Northern Indiana Public Service Company	10/15	Northern Indiana Public Service Company	Cause No. 44688	Fair Value
Indianapolis Power and Light Company	09/15	Indianapolis Power and Light Company	Cause No. 44576 Cause No. 44602	Fair Value
Kokomo Gas and Fuel Company	09/10	Kokomo Gas and Fuel Company	Cause No. 43942	Fair Value
Northern Indiana Fuel and Light Company, Inc.	09/10	Northern Indiana Fuel and Light Company, Inc.	Cause No. 43943	Fair Value
Iowa Department of Commerce Utilities Board				
MidAmerican Energy Company	06/23	MidAmerican Energy Company	Docket No. RPU-2023-___	Return on Equity
MidAmerican Energy Company	01/22	MidAmerican Energy Company	Docket No. RPU-2022-0001	Return on Equity

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Iowa-American Water Company	08/20	Iowa-American Water Company	Docket No. RPU-2020-0001	Return on Equity
Kansas Corporation Commission				
Evergy Kansas	04/23	Evergy Kansas	**Docket No. 23-_____-_____-RTS**	Return on Equity
Atmos Energy Corporation	08/15	Atmos Energy Corporation	Docket No. 16-ATMG-079-RTS	Return on Equity
Kentucky Public Service Commission				
Kentucky American Water Company	06/23	Kentucky American Water Company	Docket No. 2023-____	Return on Equity
Kentucky American Water Company	11/18	Kentucky American Water Company	Docket No. 2018-00358	Return on Equity
Maine Public Utilities Commission				
Central Maine Power	08/22	Central Maine Power	Docket No. 2022-00152	Return on Equity
Central Maine Power	10/18	Central Maine Power	Docket No. 2018-194	Return on Equity
Maryland Public Service Commission				
Maryland American Water Company	06/18	Maryland American Water Company	Case No. 9487	Return on Equity
Massachusetts Appellate Tax Board				
Hopkinton LNG Corporation	03/20	Hopkinton LNG Corporation	Docket No.	Valuation of LNG Facility
FirstLight Hydro Generating Company	06/17	FirstLight Hydro Generating Company	Docket No. F-325471 Docket No. F-325472 Docket No. F-325473 Docket No. F-325474	Valuation of Electric Generation Assets

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Massachusetts Department of Public Utilities				
Massachusetts Electric Company Nantucket Electric Company d/b/a National Grid	11/23	Massachusetts Electric Company Nantucket Electric Company d/b/a National Grid	DPU 23-150	Return on Equity
National Grid USA	11/20	Boston Gas Company	DPU 20-120	Return on Equity
Berkshire Gas Company	05/18	Berkshire Gas Company	DPU 18-40	Return on Equity
Unitil Corporation	01/04	Fitchburg Gas and Electric	DTE 03-52	Integrated Resource Plan; Gas Demand Forecast
Michigan Public Service Commission				
Indiana Michigan Power Co.	09/23	Indiana Michigan Power Co.	Case No. U-21461	Return on Equity
Michigan Gas Utilities Corporation	03/23	Michigan Gas Utilities Corporation	Case No. U-21366	Return on Equity
Michigan Gas Utilities Corporation	03/21	Michigan Gas Utilities Corporation	Case No. U-20718	Return on Equity
Wisconsin Electric Power Company	12/11	Wisconsin Electric Power Company	Case No. U-16830	Return on Equity
Michigan Tax Tribunal				
New Covert Generating Co., LLC.	03/18	The Township of New Covert Michigan	MTT Docket No. 000248TT and 16-001888-TT	Valuation of Electric Generation Assets
Covert Township	07/14	New Covert Generating Co., LLC.	Docket No. 399578	Valuation of Electric Generation Assets

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Minnesota Public Utilities Commission				
ALLETE, Inc. d/b/a Minnesota Power	11/23	Allete, Inc. d/b/a Minnesota Power	D-E-015/GR-23-155	Return on Equity
CenterPoint Energy Resources	11/23	CenterPoint Energy Resources	D-G-008/GR-23-173	Return on Equity
Minnesota Energy Resources Corporation	11/22	Minnesota Energy Resources Corporation	Docket No. G011/GR-22-504	Return on Equity
CenterPoint Energy Resources	11/21	CenterPoint Energy Resources	D-G-008/GR-21-435	Return on Equity
ALLETE, Inc. d/b/a Minnesota Power	11/21	Allete, Inc. d/b/a Minnesota Power	D-E-015/GR-21-630	Return on Equity
Otter Tail Power Company	11/20	Otter Tail Power Company	E017/GR-20-719	Return on Equity
ALLETE, Inc. d/b/a Minnesota Power	11/19	Allete, Inc. d/b/a Minnesota Power	E015/GR-19-442	Return on Equity
CenterPoint Energy Resources Corporation d/b/a CenterPoint Energy Minnesota Gas	10/19	CenterPoint Energy Resources Corporation d/b/a CenterPoint Energy Minnesota Gas	G-008/GR-19-524	Return on Equity
Great Plains Natural Gas Co.	09/19	Great Plains Natural Gas Co.	Docket No. G004/GR-19-511	Return on Equity
Minnesota Energy Resources Corporation	10/17	Minnesota Energy Resources Corporation	Docket No. G011/GR-17-563	Return on Equity
Missouri Public Service Commission				
Ameren Missouri	08/22	Ameren Missouri	File No. ER-2022-0337	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Missouri American Water Company	07/22	Missouri American Water Company	Case No. WR-2022-0303 Case No. SR-2022-0304	Return on Equity
Evergy Missouri West	1/22	Evergy Missouri West	File No. ER-2022-0130	Return on Equity
Evergy Missouri Metro	1/22	Evergy Missouri Metro	File No. ER-2022-0129	Return on Equity
Ameren Missouri	03/21	Ameren Missouri	Docket No. ER-2021-0240 Docket No. GR-2021-0241	Return on Equity
Missouri American Water Company	06/20	Missouri American Water Company	Case No. WR-2020-0344 Case No. SR-2020-0345	Return on Equity
Missouri American Water Company	06/17	Missouri American Water Company	Case No. WR-17-0285 Case No. SR-17-0286	Return on Equity
Montana Public Service Commission				
Montana-Dakota Utilities Co.	11/22	Montana-Dakota Utilities Co.	D2022.11.099	Return on Equity
Montana-Dakota Utilities Co.	06/20	Montana-Dakota Utilities Co.	D2020.06.076	Return on Equity
Montana-Dakota Utilities Co.	09/18	Montana-Dakota Utilities Co.	D2018.9.60	Return on Equity
New Hampshire - Board of Tax and Land Appeals				
Liberty Utilities (EnergyNorth Natural Gas)	07/23	Liberty Utilities (EnergyNorth Natural Gas)	Docket No. DG 23-067	Return on Equity

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Liberty Utilities (Granite State Electric)	05/23	Liberty Utilities (Granite State Electric)	Docket No. DE 23-039	Return on Equity
Public Service Company of New Hampshire d/b/a Eversource Energy	11/19 12/19	Public Service Company of New Hampshire d/b/a Eversource Energy	Master Docket No. 28873-14-15-16-17PT	Valuation of Utility Property and Generating Assets
New Hampshire Public Utilities Commission				
Public Service Company of New Hampshire	05/19	Public Service Company of New Hampshire	DE-19-057	Return on Equity
New Hampshire-Merrimack County Superior Court				
Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	04/18	Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	220-2012-CV-1100	Valuation of Utility Property
New Hampshire-Rockingham Superior Court				
Eversource Energy	05/18	Public Service Commission of New Hampshire	218-2016-CV-00899 218-2017-CV-00917	Valuation of Utility Property
New Jersey Board of Public Utilities				
Public Service Electric and Gas Company	11/23	Public Service Electric and Gas Company	ER23120924 GR23120925	Return on Equity
New Jersey American Water Company, Inc.	01/22	New Jersey American Water Company, Inc.	WR22010019	Return on Equity
Public Service Electric and Gas Company	10/20	Public Service Electric and Gas Company	EO18101115	Return on Equity
New Jersey American Water Company, Inc.	12/19	New Jersey American Water Company, Inc.	WR19121516	Return on Equity
Public Service Electric and Gas Company	04/19	Public Service Electric and Gas Company	EO18060629 GO18060630	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Public Service Electric and Gas Company	02/18	Public Service Electric and Gas Company	GR17070776	Return on Equity
Public Service Electric and Gas Company	01/18	Public Service Electric and Gas Company	ER18010029 GR18010030	Return on Equity
New Mexico Public Regulation Commission				
Southwestern Public Service Company	07/19	Southwestern Public Service Company	19-00170-UT	Return on Equity
Southwestern Public Service Company	10/17	Southwestern Public Service Company	Case No. 17-00255-UT	Return on Equity
Southwestern Public Service Company	12/16	Southwestern Public Service Company	Case No. 16-00269-UT	Return on Equity
Southwestern Public Service Company	10/15	Southwestern Public Service Company	Case No. 15-00296-UT	Return on Equity
Southwestern Public Service Company	06/15	Southwestern Public Service Company	Case No. 15-00139-UT	Return on Equity
New York State Department of Public Service				
Liberty Utilities (New York Water)	5/23	Liberty Utilities (New York Water)	Case 23-W-0235	Return on Equity
New York State Electric and Gas Company Rochester Gas and Electric	05/22	New York State Electric and Gas Company Rochester Gas and Electric	22-E-0317 22-G-0318 22-E-0319 22-G-0320	Return on Equity
Corning Natural Gas Corporation	07/21	Corning Natural Gas Corporation	Case No. 21-G-0394	Return on Equity
Central Hudson Gas and Electric Corporation	08/20	Central Hudson Gas and Electric Corporation	Electric 20-E-0428 Gas 20-G-0429	Return on Equity
Niagara Mohawk Power Corporation	07/20	National Grid USA	Case No. 20-E-0380 20-G-0381	Return on Equity

Brattle

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Corning Natural Gas Corporation	02/20	Corning Natural Gas Corporation	Case No. 20-G-0101	Return on Equity
New York State Electric and Gas Company Rochester Gas and Electric	05/19	New York State Electric and Gas Company Rochester Gas and Electric	19-E-0378 19-G-0379 19-E-0380 19-G-0381	Return on Equity
Brooklyn Union Gas Company d/b/a National Grid NY KeySpan Gas East Corporation d/b/a National Grid	04/19	Brooklyn Union Gas Company d/b/a National Grid NY KeySpan Gas East Corporation d/b/a National Grid	19-G-0309 19-G-0310	Return on Equity
Central Hudson Gas and Electric Corporation	07/17	Central Hudson Gas and Electric Corporation	Electric 17-E-0459 Gas 17-G-0460	Return on Equity
Niagara Mohawk Power Corporation	04/17	National Grid USA	Case No. 17-E-0238 17-G-0239	Return on Equity
Corning Natural Gas Corporation	06/16	Corning Natural Gas Corporation	Case No. 16-G-0369	Return on Equity
National Fuel Gas Company	04/16	National Fuel Gas Company	Case No. 16-G-0257	Return on Equity
KeySpan Energy Delivery	01/16	KeySpan Energy Delivery	Case No. 15-G-0058 Case No. 15-G-0059	Return on Equity
New York State Electric and Gas Company Rochester Gas and Electric	05/15	New York State Electric and Gas Company Rochester Gas and Electric	Case No. 15-E-0283 Case No. 15-G-0284 Case No. 15-E-0285 Case No. 15-G-0286	Return on Equity
North Dakota Public Service Commission				
Otter Tail Power Company	11/23	Otter Tail Power Company	Case No. PU-23-___	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Montana-Dakota Utilities Co.	11/23	Montana-Dakota Utilities Co.	Case No. PU-23-___	Return on Equity
Montana-Dakota Utilities Co.	05/22	Montana-Dakota Utilities Co.	C-PU-22-194	Return on Equity
Montana-Dakota Utilities Co.	08/20	Montana-Dakota Utilities Co.	C-PU-20-379	Return on Equity
Northern States Power Company	12/12	Northern States Power Company	C-PU-12-813	Return on Equity
Northern States Power Company	12/10	Northern States Power Company	C-PU-10-657	Return on Equity
Oklahoma Corporation Commission				
Oklahoma Gas & Electric	12/23	Oklahoma Gas & Electric	Cause No. PUD2023-000087	Return on Equity
Oklahoma Gas & Electric	12/21	Oklahoma Gas & Electric	Cause No. PUD 202100164	Return on Equity
Arkansas Oklahoma Gas Corporation	01/13	Arkansas Oklahoma Gas Corporation	Cause No. PUD 201200236	Return on Equity
Oregon Public Service Commission				
PacifiCorp d/b/a Pacific Power & Light	03/22	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-399	Return on Equity
PacifiCorp d/b/a Pacific Power & Light	02/20	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-374	Return on Equity
Pennsylvania Public Utility Commission				
American Water Works Company Inc.	11/23	Pennsylvania-American Water Company	Docket No. R-2023-3043189 (water) Docket No. R-2023-3043190 (wastewater)	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
American Water Works Company Inc.	04/22	Pennsylvania-American Water Company	Docket No. R-2020-3031672 (water) Docket No. R-2020-3031673 (wastewater)	Return on Equity
American Water Works Company Inc.	04/20	Pennsylvania-American Water Company	Docket No. R-2020-3019369 (water) Docket No. R-2020-3019371 (wastewater)	Return on Equity
American Water Works Company Inc.	04/17	Pennsylvania-American Water Company	Docket No. R-2017-2595853	Return on Equity
South Dakota Public Utilities Commission				
MidAmerican Energy Company	05/22	MidAmerican Energy Company	D-NG22-005	Return on Equity
Northern States Power Company	06/14	Northern States Power Company	Docket No. EL14-058	Return on Equity
Texas Public Utility Commission				
Entergy Texas, Inc.	07/22	Entergy Texas, Inc.	D-53719	Return on Equity
Southwestern Public Service Commission	08/19	Southwestern Public Service Commission	Docket No. D-49831	Return on Equity
Southwestern Public Service Company	01/14	Southwestern Public Service Company	Docket No. 42004	Return on Equity
Texas Railroad Commission				
CenterPoint Energy Entex and CenterPoint Energy Texas Gas	10/23	CenterPoint Energy Entex and CenterPoint Energy Texas Gas	2023 Texas Division Rate Case Case No. OS-23-00015513	Return on Equity

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SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Utah Public Service Commission				
PacifiCorp d/b/a Rocky Mountain Power	05/20	PacifiCorp d/b/a Rocky Mountain Power	Docket No. 20-035-04	Return on Equity
Virginia State Corporation Commission				
Virginia American Water Company, Inc.	11/23	Virginia American Water Company, Inc.	Docket No. PUR-2023-00194	Return on Equity
Virginia American Water Company, Inc.	11/21	Virginia American Water Company, Inc.	Docket No. PUR-2021-00255	Return on Equity
Virginia American Water Company, Inc.	11/18	Virginia American Water Company, Inc.	Docket No. PUR-2018-00175	Return on Equity
Washington Utilities Transportation Commission				
PacifiCorp d/b/a Pacific Power & Light	03/23	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-230172	Return on Equity
Cascade Natural Gas Corporation	06/20	Cascade Natural Gas Corporation	Docket No. UG-200568	Return on Equity
PacifiCorp d/b/a Pacific Power & Light	12/19	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-191024	Return on Equity
Cascade Natural Gas Corporation	04/19	Cascade Natural Gas Corporation	Docket No. UG-190210	Return on Equity
West Virginia Public Service Commission				
West Virginia American Water Company	05/23	West Virginia American Water Company	Case No. 23-0383-W-42T	Return on Equity
West Virginia American Water Company	04/21	West Virginia American Water Company	Case No. 21-02369-W-42T	Return on Equity
West Virginia American Water Company	04/18	West Virginia American Water Company	Case No. 18-0573-W-42T Case No. 18-0576-S-42T	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Wisconsin Public Service Commission				
Wisconsin Power and Light	05/23	Wisconsin Power and Light	Docket No. 6680-UR-124	Return on Equity
Wisconsin Electric Power Company and Wisconsin Gas LLC	04/22	Wisconsin Electric Power Company and Wisconsin Gas LLC	Docket No. 05-UR-110	Return on Equity
Wisconsin Public Service Corp.	04/22	Wisconsin Public Service Corp.	6690-UR-127	Return on Equity
Alliant Energy		Alliant Energy		Return on Equity
Wisconsin Electric Power Company and Wisconsin Gas LLC	03/19	Wisconsin Electric Power Company and Wisconsin Gas LLC	Docket No. 05-UR-109	Return on Equity
Wisconsin Public Service Corp.	03/19	Wisconsin Public Service Corp.	6690-UR-126	Return on Equity
Wyoming Public Service Commission				
PacifiCorp d/b/a Rocky Mountain Power	02/23	PacifiCorp d/b/a Rocky Mountain Power	Docket No. 20000-633-ER-23	Return on Equity
PacifiCorp d/b/a Rocky Mountain Power	03/20	PacifiCorp d/b/a Rocky Mountain Power	Docket No. 20000-578-ER-20	Return on Equity
Montana-Dakota Utilities Co.	05/19	Montana-Dakota Utilities Co.	30013-351-GR-19	Return on Equity

CERTIFICATIONS/ACCREDITATIONS

Certified General Appraiser, licensed in the Commonwealth of Massachusetts

COST OF EQUITY ANALYSES
SUMMARY OF RESULTS
NATURAL GAS UTILITY PROXY GROUP

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.89%	10.84%	12.02%
90-Day Avg. Stock Price	9.72%	10.67%	11.85%
180-Day Avg. Stock Price	9.53%	10.48%	11.66%
Average	9.72%	10.66%	11.84%
Median Results:			
30-Day Avg. Stock Price	10.03%	10.30%	11.92%
90-Day Avg. Stock Price	9.97%	10.24%	11.70%
180-Day Avg. Stock Price	9.95%	10.22%	11.38%
Average	9.98%	10.25%	11.67%

Multi-Stage DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	10.06%	10.32%	10.67%
90-Day Avg. Stock Price	9.88%	10.14%	10.47%
180-Day Avg. Stock Price	9.68%	9.93%	10.25%
Average	9.87%	10.13%	10.46%
Median Results:			
30-Day Avg. Stock Price	10.16%	10.47%	10.80%
90-Day Avg. Stock Price	10.08%	10.39%	10.71%
180-Day Avg. Stock Price	9.85%	10.27%	10.60%
Average	10.03%	10.37%	10.70%

CAPM / ECAPM / Bond Yield Risk Premium

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.47%	11.43%	11.37%
Current Bloomberg Beta	10.72%	10.65%	10.56%
Long-term Avg. *Value Line* Beta	10.43%	10.35%	10.25%
ECAPM:			
Current *Value Line* Beta	11.74%	11.71%	11.67%
Current Bloomberg Beta	11.18%	11.13%	11.06%
Long-term Avg. *Value Line* Beta	10.96%	10.90%	10.83%
Bond Yield Risk Premium	10.63%	10.46%	10.25%

COST OF EQUITY ANALYSES
SUMMARY OF RESULTS
COMBINATION UTILITY PROXY GROUP

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.62%	10.30%	10.92%
90-Day Avg. Stock Price	9.58%	10.26%	10.88%
180-Day Avg. Stock Price	9.41%	10.08%	10.71%
Average	9.54%	10.21%	10.84%
Median Results:			
30-Day Avg. Stock Price	9.66%	9.97%	10.93%
90-Day Avg. Stock Price	9.59%	9.95%	10.88%
180-Day Avg. Stock Price	9.45%	9.86%	10.62%
Average	9.57%	9.93%	10.81%

Multi-Stage DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.77%	9.94%	10.10%
90-Day Avg. Stock Price	9.73%	9.89%	10.05%
180-Day Avg. Stock Price	9.53%	9.70%	9.85%
Average	9.68%	9.84%	10.00%
Median Results:			
30-Day Avg. Stock Price	9.62%	9.87%	10.08%
90-Day Avg. Stock Price	9.60%	9.87%	10.09%
180-Day Avg. Stock Price	9.48%	9.77%	9.99%
Average	9.57%	9.84%	10.05%

CAPM / ECAPM / Bond Yield Risk Premium

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.44%	11.40%	11.34%
Current Bloomberg Beta	10.73%	10.66%	10.57%
Long-term Avg. *Value Line* Beta	10.30%	10.22%	10.11%
ECAPM:			
Current *Value Line* Beta	11.72%	11.69%	11.64%
Current Bloomberg Beta	11.19%	11.14%	11.07%
Long-term Avg. *Value Line* Beta	10.87%	10.80%	10.72%
Bond Yield Risk Premium	10.79%	10.62%	10.40%

PROXY GROUP SCREENING DATA AND RESULTS
NATURAL GAS UTILITY PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]
Company	Ticker	Dividends	S&P or Moody's Investment Grade Credit Rating	Covered by More Than 1 Analyst	Positive Growth Rates from at least two sources (Value Line, Yahoo! First Call, and Zacks)	% Regulated Operating Income > 70%	% Regulated Natural Gas Operating Income > 60%	Announced Merger
Atmos Energy Corporation	ATO	Yes	A-	Yes	Yes	100.00%	66.03%	No
NiSource Inc.	NI	Yes	BBB+	Yes	Yes	100.00%	65.58%	No
Northwest Natural Gas Company	NWN	Yes	A+	Yes	Yes	99.84%	91.01%	No
ONE Gas, Inc.	OGS	Yes	A-	Yes	Yes	100.00%	100.00%	No
Spire, Inc.	SR	Yes	A-	Yes	Yes	86.84%	100.00%	No

Notes:
[1]-[2]: Bloomberg Professional
[3]: Yahoo! Finance, Value Line Investment Survey, and Zacks
[4]-[5]: Form 10-K's for 2022, 2020, and 2021
[6]: S&P Capital IQ news releases
[7]: S&P Capital IQ news releases

PROXY GROUP SCREENING DATA AND RESULTS
COMBINATION UTILITY PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Dividends	S&P Credit Rating Between BBB- and AAA	Covered by More Than 1 Analyst	Positive Growth Rates from at least two sources (Value Line, Yahoo! First Call, and Zacks)	Generation Assets Included in Rate Base	% Company-Owned Generation > 40%	% Regulated Operating Income > 70%	% Regulated Natural Gas Operating Income > 10%	Announced Merger
NiSource Inc.	NI	Yes	BBB+	Yes	Yes	Yes	46.86%	100.17%	65.58%	No
Ameren Corporation	AEE	Yes	BBB+	Yes	Yes	Yes	75.34%	100.00%	15.43%	No
Avista Corporation	AVA	Yes	BBB	Yes	Yes	Yes	59.47%	100.00%	26.15%	No
CMS Energy Corporation	CMS	Yes	BBB+	Yes	Yes	Yes	42.50%	99.71%	34.20%	No
MGE Energy, Inc.	MGEE	Yes	AA-	Yes	Yes	Yes	68.13%	72.55%	26.84%	No
NorthWestern Corporation	NWE	Yes	BBB	Yes	Yes	Yes	55.82%	99.75%	15.51%	No
Southern Company	SO	Yes	BBB+	Yes	Yes	Yes	76.85%	94.89%	20.78%	No
Wisconsin Energy Corporation	WEC	Yes	A-	Yes	Yes	Yes	65.67%	99.53%	46.01%	No

Notes:
[1]-[2] Bloomberg Professional
[3] Yahoo! Finance and Zacks
[4] Yahoo! Finance, Value Line Investment Survey, and Zacks
[5]-[6] S&P Capital IQ Pro
[7]-[9] Form 10-K's for 2022, 2021, and 2020
[10] S&P Capital IQ Pro Financial News Releases

30-DAY CONSTANT GROWTH DCF
NATURAL GAS UTILITY PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Projected EPS Growth Rate	Yahoo! Finance Projected EPS Growth Rate	Zacks Projected EPS Growth Rate	Average Projected EPS Growth Rate	Cost of Equity: Minimum Growth Rate	Cost of Equity: Mean Growth Rate	Cost of Equity: Maximum Growth Rate
Atmos Energy Corporation	ATO	$3.22	$110.15	2.92%	3.03%	7.00%	7.50%	7.30%	7.27%	10.03%	10.30%	10.53%
NiSource Inc.	NI	$1.00	$25.47	3.93%	4.09%	9.50%	8.30%	7.20%	8.33%	11.27%	12.42%	13.61%
Northwest Natural Gas Company	NWN	$1.95	$37.13	5.25%	5.36%	6.50%	2.80%	3.70%	4.33%	8.12%	9.70%	11.92%
ONE Gas, Inc.	OGS	$2.60	$60.91	4.27%	4.39%	6.50%	5.00%	5.00%	5.50%	9.38%	9.89%	10.91%
Spire, Inc.	SR	$2.88	$58.30	4.94%	5.11%	8.00%	n/a	5.60%	6.80%	10.68%	11.91%	13.14%
Mean										9.89%	10.84%	12.02%
Median										10.03%	10.30%	11.92%

Notes:
[1] Bloomberg Professional as of November 30, 2023
[2] Bloomberg Professional 30-day average as of November 30, 2023
[3] Equals [1]/[2]
[4] Equals [3] x (1 + 0.5 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals average of [5], [6], [7]
[9] Equals [3] x (1 + 0.5 x (min([5], [6], [7])) + (min([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.5 x (max([5], [6], [7])) + (max([5], [6], [7])

90-DAY CONSTANT GROWTH DCF
NATURAL GAS UTILITY PROXY GROUP

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Projected EPS Growth Rate	[6] Yahoo! Finance Projected EPS Growth Rate	[7] Zacks Projected EPS Growth Rate	[8] Average Projected EPS Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
Atmos Energy Corporation	ATO	$3.22	$112.18	2.87%	2.97%	7.00%	7.50%	7.30%	7.27%	9.97%	10.24%	10.48%
NiSource Inc.	NI	$1.00	$25.91	3.86%	4.02%	9.50%	8.30%	7.20%	8.33%	11.20%	12.35%	13.54%
Northwest Natural Gas Company	NWN	$1.95	$38.73	5.04%	5.14%	6.50%	2.80%	3.70%	4.33%	7.91%	9.48%	11.70%
ONE Gas, Inc.	OGS	$2.60	$68.57	3.79%	3.90%	6.50%	5.00%	5.00%	5.50%	8.89%	9.40%	10.42%
Spire, Inc.	SR	$2.88	$58.60	4.91%	5.08%	8.00%	n/a	5.60%	6.80%	10.65%	11.88%	13.11%
Mean										9.72%	10.67%	11.85%
Median										9.97%	10.24%	11.70%

Notes:
[1] Bloomberg Professional as of November 30, 2023
[2] Bloomberg Professional 90-day average as of November 30, 2023
[3] Equals [1]/[2]
[4] Equals [3] x (1 + 0.5 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals average of [5], [6], [7]
[9] Equals [3] x (1 + 0.5 x (min([5], [6], [7])) + (min([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.5 x (max([5], [6], [7])) + (max([5], [6], [7])

180-DAY CONSTANT GROWTH DCF
NATURAL GAS UTILITY PROXY GROUP

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Projected EPS Growth Rate	[6] Yahoo! Finance Projected EPS Growth Rate	[7] Zacks Projected EPS Growth Rate	[8] Average Projected EPS Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
Atmos Energy Corporation	ATO	$3.22	$113.07	2.85%	2.95%	7.00%	7.50%	7.30%	7.27%	9.95%	10.22%	10.45%
NiSource Inc.	NI	$1.00	$26.50	3.77%	3.93%	9.50%	8.30%	7.20%	8.33%	11.11%	12.26%	13.45%
Northwest Natural Gas Company	NWN	$1.95	$41.27	4.73%	4.83%	6.50%	2.80%	3.70%	4.33%	7.59%	9.16%	11.38%
ONE Gas, Inc.	OGS	$2.60	$72.99	3.56%	3.66%	6.50%	5.00%	5.00%	5.50%	8.65%	9.16%	10.18%
Spire, Inc.	SR	$2.88	$62.07	4.64%	4.80%	8.00%	n/a	5.60%	6.80%	10.37%	11.60%	12.83%
Mean										9.53%	10.48%	11.66%
Median										9.95%	10.22%	11.38%

Notes:
[1] Bloomberg Professional as of November 30, 2023
[2] Bloomberg Professional 180-day average as of November 30, 2023
[3] Equals [1]/[2]
[4] Equals [3] x (1 + 0.5 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals average of [5], [6], [7]
[9] Equals [3] x (1 + 0.5 x (min([5], [6], [7])) + (min([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.5 x (max([5], [6], [7])) + (max([5], [6], [7])

30-DAY CONSTANT GROWTH DCF
COMBINATION UTILITY PROXY GROUP

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Projected EPS Growth Rate	[6] Yahoo! Finance Projected EPS Growth Rate	[7] Zacks Projected EPS Growth Rate	[8] Average Projected EPS Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
NiSource Inc.	NI	$1.00	$25.47	3.93%	4.09%	9.50%	8.30%	7.20%	8.33%	11.27%	12.42%	13.61%
Ameren Corporation	AEE	$2.52	$76.88	3.28%	3.38%	6.50%	6.20%	6.60%	6.43%	9.58%	9.82%	9.99%
Avista Corporation	AVA	$1.84	$33.32	5.52%	5.69%	6.00%	5.90%	5.90%	5.93%	11.59%	11.62%	11.69%
CMS Energy Corporation	CMS	$1.95	$55.46	3.52%	3.64%	6.50%	7.70%	7.50%	7.23%	10.13%	10.88%	11.35%
MGE Energy, Inc.	MGEE	$1.71	$72.34	2.36%	2.43%	6.50%	5.40%	5.30%	5.73%	7.73%	8.16%	8.94%
NorthWestern Corporation	NWE	$2.56	$49.46	5.18%	5.29%	3.50%	4.08%	5.20%	4.26%	8.77%	9.55%	10.51%
Southern Company	SO	$2.80	$68.05	4.11%	4.24%	6.50%	7.10%	4.00%	5.87%	8.20%	10.10%	11.36%
Wisconsin Energy Corporation	WEC	$3.12	$81.41	3.83%	3.95%	6.00%	5.80%	5.90%	5.90%	9.74%	9.85%	9.95%
Mean										9.62%	10.30%	10.92%
Median										9.66%	9.97%	10.93%

Notes:
[1] Bloomberg Professional as of November 30, 2023
[2] Bloomberg Professional 30-day average as of November 30, 2023
[3] Equals [1]/[2]
[4] Equals [3] x (1 + 0.5 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals average of [5], [6], [7]
[9] Equals [3] x (1 + 0.5 x (min([5], [6], [7])) + (min([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.5 x (max([5], [6], [7])) + (max([5], [6], [7])

90-DAY CONSTANT GROWTH DCF
COMBINATION UTILITY PROXY GROUP

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Projected EPS Growth Rate	[6] Yahoo! Finance Projected EPS Growth Rate	[7] Zacks Projected EPS Growth Rate	[8] Average Projected EPS Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
NiSource Inc.	NI	$1.00	$25.91	3.86%	4.02%	9.50%	8.30%	7.20%	8.33%	11.20%	12.35%	13.54%
Ameren Corporation	AEE	$2.52	$78.29	3.22%	3.32%	6.50%	6.20%	6.60%	6.43%	9.52%	9.76%	9.92%
Avista Corporation	AVA	$1.84	$33.50	5.49%	5.66%	6.00%	5.90%	5.90%	5.93%	11.55%	11.59%	11.66%
CMS Energy Corporation	CMS	$1.95	$55.55	3.51%	3.64%	6.50%	7.70%	7.50%	7.23%	10.12%	10.87%	11.35%
MGE Energy, Inc.	MGEE	$1.71	$72.89	2.35%	2.41%	6.50%	5.40%	5.30%	5.73%	7.71%	8.15%	8.92%
NorthWestern Corporation	NWE	$2.56	$50.42	5.08%	5.19%	3.50%	4.08%	5.20%	4.26%	8.67%	9.45%	10.41%
Southern Company	SO	$2.80	$67.52	4.15%	4.27%	6.50%	7.10%	4.00%	5.87%	8.23%	10.14%	11.39%
Wisconsin Energy Corporation	WEC	$3.12	$82.96	3.76%	3.87%	6.00%	5.80%	5.90%	5.90%	9.67%	9.77%	9.87%
Mean										9.58%	10.26%	10.88%
Median										9.59%	9.95%	10.88%

Notes:
[1] Bloomberg Professional as of November 30, 2023
[2] Bloomberg Professional 90-day average as of November 30, 2023
[3] Equals [1]/[2]
[4] Equals [3] x (1 + 0.5 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals average of [5], [6], [7]
[9] Equals [3] x (1 + 0.5 x (min([5], [6], [7])) + (min([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.5 x (max([5], [6], [7])) + (max([5], [6], [7])

180-DAY CONSTANT GROWTH DCF
COMBINATION UTILITY PROXY GROUP

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Projected EPS Growth Rate	[6] Yahoo! Finance Projected EPS Growth Rate	[7] Zacks Projected EPS Growth Rate	[8] Average Projected EPS Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
NiSource Inc.	NI	$1.00	$26.50	3.77%	3.93%	9.50%	8.30%	7.20%	8.33%	11.11%	12.26%	13.45%
Ameren Corporation	AEE	$2.52	$81.27	3.10%	3.20%	6.50%	6.20%	6.60%	6.43%	9.40%	9.63%	9.80%
Avista Corporation	AVA	$1.84	$36.89	4.99%	5.14%	6.00%	5.90%	5.90%	5.93%	11.04%	11.07%	11.14%
CMS Energy Corporation	CMS	$1.95	$57.38	3.40%	3.52%	6.50%	7.70%	7.50%	7.23%	10.01%	10.75%	11.23%
MGE Energy, Inc.	MGEE	$1.71	$74.47	2.30%	2.36%	6.50%	5.40%	5.30%	5.73%	7.66%	8.10%	8.87%
NorthWestern Corporation	NWE	$2.56	$53.59	4.78%	4.88%	3.50%	4.08%	5.20%	4.26%	8.36%	9.14%	10.10%
Southern Company	SO	$2.80	$68.47	4.09%	4.21%	6.50%	7.10%	4.00%	5.87%	8.17%	10.08%	11.33%
Wisconsin Energy Corporation	WEC	$3.12	$86.53	3.61%	3.71%	6.00%	5.80%	5.90%	5.90%	9.51%	9.61%	9.71%
Mean										9.41%	10.08%	10.71%
Median										9.45%	9.86%	10.62%

Notes:
[1] Bloomberg Professional as of November 30, 2023
[2] Bloomberg Professional 180-day average as of November 30, 2023
[3] Equals [1]/[2]
[4] Equals [3] x (1 + 0.5 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals average of [5], [6], [7]
[9] Equals [3] x (1 + 0.5 x (min([5], [6], [7])) + (min([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.5 x (max([5], [6], [7])) + (max([5], [6], [7])

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **30** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$110.15	7.00%	6.75%	6.50%	6.25%	6.00%	5.76%	5.51%	8.92%
NiSource Inc.	NI	$1.00	$25.47	7.20%	6.92%	6.64%	6.35%	6.07%	5.79%	5.51%	10.16%
Northwest Natural Gas Company	NWN	$1.95	$37.13	2.80%	3.25%	3.70%	4.15%	4.60%	5.06%	5.51%	10.36%
ONE Gas, Inc.	OGS	$2.60	$60.91	5.00%	5.08%	5.17%	5.25%	5.34%	5.42%	5.51%	9.97%
Spire, Inc.	SR	$2.88	$58.30	5.60%	5.58%	5.57%	5.55%	5.54%	5.52%	5.51%	10.87%
Mean					5.52%	5.52%	5.51%	5.51%	5.51%	5.51%	10.06%
Median					5.58%	5.57%	5.55%	5.54%	5.52%	5.51%	10.16%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 30-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **90** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$112.18	7.00%	6.75%	6.50%	6.25%	6.00%	5.76%	5.51%	8.86%
NiSource Inc.	NI	$1.00	$25.91	7.20%	6.92%	6.64%	6.35%	6.07%	5.79%	5.51%	10.08%
Northwest Natural Gas Company	NWN	$1.95	$38.73	2.80%	3.25%	3.70%	4.15%	4.60%	5.06%	5.51%	10.15%
ONE Gas, Inc.	OGS	$2.60	$68.57	5.00%	5.08%	5.17%	5.25%	5.34%	5.42%	5.51%	9.46%
Spire, Inc.	SR	$2.88	$58.60	5.60%	5.58%	5.57%	5.55%	5.54%	5.52%	5.51%	10.84%
Mean					5.52%	5.52%	5.51%	5.51%	5.51%	5.51%	9.88%
Median					5.58%	5.57%	5.55%	5.54%	5.52%	5.51%	10.08%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 90-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **180** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$113.07	7.00%	6.75%	6.50%	6.25%	6.00%	5.76%	5.51%	8.83%
NiSource Inc.	NI	$1.00	$26.50	7.20%	6.92%	6.64%	6.35%	6.07%	5.79%	5.51%	9.98%
Northwest Natural Gas Company	NWN	$1.95	$41.27	2.80%	3.25%	3.70%	4.15%	4.60%	5.06%	5.51%	9.85%
ONE Gas, Inc.	OGS	$2.60	$72.99	5.00%	5.08%	5.17%	5.25%	5.34%	5.42%	5.51%	9.21%
Spire, Inc.	SR	$2.88	$62.07	5.60%	5.58%	5.57%	5.55%	5.54%	5.52%	5.51%	10.54%
Mean					5.52%	5.52%	5.51%	5.51%	5.51%	5.51%	9.68%
Median					5.58%	5.57%	5.55%	5.54%	5.52%	5.51%	9.85%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 180-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **30** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$110.15	7.27%	6.97%	6.68%	6.39%	6.09%	5.80%	5.51%	8.97%
NiSource Inc.	NI	$1.00	$25.47	8.33%	7.86%	7.39%	6.92%	6.45%	5.98%	5.51%	10.47%
Northwest Natural Gas Company	NWN	$1.95	$37.13	4.33%	4.53%	4.72%	4.92%	5.12%	5.31%	5.51%	10.82%
ONE Gas, Inc.	OGS	$2.60	$60.91	5.50%	5.50%	5.50%	5.50%	5.50%	5.51%	5.51%	10.10%
Spire, Inc.	SR	$2.88	$58.30	6.80%	6.58%	6.37%	6.15%	5.94%	5.72%	5.51%	11.25%
Mean					6.29%	6.13%	5.98%	5.82%	5.66%	5.51%	10.32%
Median					6.58%	6.37%	6.15%	5.94%	5.72%	5.51%	10.47%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 30-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **90** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$112.18	7.27%	6.97%	6.68%	6.39%	6.09%	5.80%	5.51%	8.91%
NiSource Inc.	NI	$1.00	$25.91	8.33%	7.86%	7.39%	6.92%	6.45%	5.98%	5.51%	10.39%
Northwest Natural Gas Company	NWN	$1.95	$38.73	4.33%	4.53%	4.72%	4.92%	5.12%	5.31%	5.51%	10.59%
ONE Gas, Inc.	OGS	$2.60	$68.57	5.50%	5.50%	5.50%	5.50%	5.50%	5.51%	5.51%	9.57%
Spire, Inc.	SR	$2.88	$58.60	6.80%	6.58%	6.37%	6.15%	5.94%	5.72%	5.51%	11.22%
Mean					6.29%	6.13%	5.98%	5.82%	5.66%	5.51%	10.14%
Median					6.58%	6.37%	6.15%	5.94%	5.72%	5.51%	10.39%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 90-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **180** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$113.07	7.27%	6.97%	6.68%	6.39%	6.09%	5.80%	5.51%	8.88%
NiSource Inc.	NI	$1.00	$26.50	8.33%	7.86%	7.39%	6.92%	6.45%	5.98%	5.51%	10.28%
Northwest Natural Gas Company	NWN	$1.95	$41.27	4.33%	4.53%	4.72%	4.92%	5.12%	5.31%	5.51%	10.27%
ONE Gas, Inc.	OGS	$2.60	$72.99	5.50%	5.50%	5.50%	5.50%	5.50%	5.51%	5.51%	9.32%
Spire, Inc.	SR	$2.88	$62.07	6.80%	6.58%	6.37%	6.15%	5.94%	5.72%	5.51%	10.89%
Mean					6.29%	6.13%	5.98%	5.82%	5.66%	5.51%	9.93%
Median					6.58%	6.37%	6.15%	5.94%	5.72%	5.51%	10.27%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 180-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

MAXIMUM FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **30** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$110.15	7.50%	7.17%	6.84%	6.50%	6.17%	5.84%	5.51%	9.02%
NiSource Inc.	NI	$1.00	$25.47	9.50%	8.83%	8.17%	7.50%	6.84%	6.17%	5.51%	10.80%
Northwest Natural Gas Company	NWN	$1.95	$37.13	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	11.51%
ONE Gas, Inc.	OGS	$2.60	$60.91	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	10.37%
Spire, Inc.	SR	$2.88	$58.30	8.00%	7.58%	7.17%	6.75%	6.34%	5.92%	5.51%	11.64%
Mean					7.25%	6.90%	6.55%	6.20%	5.86%	5.51%	10.67%
Median					7.17%	6.84%	6.50%	6.17%	5.84%	5.51%	10.80%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 30-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

MAXIMUM FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **90** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$112.18	7.50%	7.17%	6.84%	6.50%	6.17%	5.84%	5.51%	8.96%
NiSource Inc.	NI	$1.00	$25.91	9.50%	8.83%	8.17%	7.50%	6.84%	6.17%	5.51%	10.71%
Northwest Natural Gas Company	NWN	$1.95	$38.73	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	11.26%
ONE Gas, Inc.	OGS	$2.60	$68.57	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	9.82%
Spire, Inc.	SR	$2.88	$58.60	8.00%	7.58%	7.17%	6.75%	6.34%	5.92%	5.51%	11.61%
Mean					7.25%	6.90%	6.55%	6.20%	5.86%	5.51%	10.47%
Median					7.17%	6.84%	6.50%	6.17%	5.84%	5.51%	10.71%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 90-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
NATURAL GAS UTILITY PROXY GROUP

MAXIMUM FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **180** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
Atmos Energy Corporation	ATO	$3.22	$113.07	7.50%	7.17%	6.84%	6.50%	6.17%	5.84%	5.51%	8.93%
NiSource Inc.	NI	$1.00	$26.50	9.50%	8.83%	8.17%	7.50%	6.84%	6.17%	5.51%	10.60%
Northwest Natural Gas Company	NWN	$1.95	$41.27	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	10.90%
ONE Gas, Inc.	OGS	$2.60	$72.99	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	9.56%
Spire, Inc.	SR	$2.88	$62.07	8.00%	7.58%	7.17%	6.75%	6.34%	5.92%	5.51%	11.27%
Mean					7.25%	6.90%	6.55%	6.20%	5.86%	5.51%	10.25%
Median					7.17%	6.84%	6.50%	6.17%	5.84%	5.51%	10.60%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 180-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **30** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$25.47	7.20%	6.92%	6.64%	6.35%	6.07%	5.79%	5.51%	10.16%
Ameren Corporation	AEE	$2.52	$76.88	6.20%	6.08%	5.97%	5.85%	5.74%	5.62%	5.51%	9.16%
Avista Corporation	AVA	$1.84	$33.32	5.90%	5.83%	5.77%	5.70%	5.64%	5.57%	5.51%	11.62%
CMS Energy Corporation	CMS	$1.95	$55.46	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	9.50%
MGE Energy, Inc.	MGEE	$1.71	$72.34	5.30%	5.33%	5.37%	5.40%	5.44%	5.47%	5.51%	7.97%
NorthWestern Corporation	NWE	$2.56	$49.46	3.50%	3.83%	4.17%	4.50%	4.84%	5.17%	5.51%	10.49%
Southern Company	SO	$2.80	$68.05	4.00%	4.25%	4.50%	4.75%	5.00%	5.26%	5.51%	9.55%
Wisconsin Energy Corporation	WEC	$3.12	$81.41	5.80%	5.75%	5.70%	5.65%	5.60%	5.56%	5.51%	9.69%
Mean					5.54%	5.54%	5.53%	5.52%	5.51%	5.51%	9.77%
Median					5.79%	5.74%	5.68%	5.62%	5.56%	5.51%	9.62%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 30-trading day average as of November 30, 2023
[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **90** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$25.91	7.20%	6.92%	6.64%	6.35%	6.07%	5.79%	5.51%	10.08%
Ameren Corporation	AEE	$2.52	$78.29	6.20%	6.08%	5.97%	5.85%	5.74%	5.62%	5.51%	9.09%
Avista Corporation	AVA	$1.84	$33.50	5.90%	5.83%	5.77%	5.70%	5.64%	5.57%	5.51%	11.59%
CMS Energy Corporation	CMS	$1.95	$55.55	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	9.50%
MGE Energy, Inc.	MGEE	$1.71	$72.89	5.30%	5.33%	5.37%	5.40%	5.44%	5.47%	5.51%	7.95%
NorthWestern Corporation	NWE	$2.56	$50.42	3.50%	3.83%	4.17%	4.50%	4.84%	5.17%	5.51%	10.39%
Southern Company	SO	$2.80	$67.52	4.00%	4.25%	4.50%	4.75%	5.00%	5.26%	5.51%	9.58%
Wisconsin Energy Corporation	WEC	$3.12	$82.96	5.80%	5.75%	5.70%	5.65%	5.60%	5.56%	5.51%	9.61%
Mean					5.54%	5.54%	5.53%	5.52%	5.51%	5.51%	9.73%
Median					5.79%	5.74%	5.68%	5.62%	5.56%	5.51%	9.60%

Notes:
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[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: 180 DAYS

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$26.50	7.20%	6.92%	6.64%	6.35%	6.07%	5.79%	5.51%	9.98%
Ameren Corporation	AEE	$2.52	$81.27	6.20%	6.08%	5.97%	5.85%	5.74%	5.62%	5.51%	8.96%
Avista Corporation	AVA	$1.84	$36.89	5.90%	5.83%	5.77%	5.70%	5.64%	5.57%	5.51%	11.02%
CMS Energy Corporation	CMS	$1.95	$57.38	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	9.37%
MGE Energy, Inc.	MGEE	$1.71	$74.47	5.30%	5.33%	5.37%	5.40%	5.44%	5.47%	5.51%	7.89%
NorthWestern Corporation	NWE	$2.56	$53.59	3.50%	3.83%	4.17%	4.50%	4.84%	5.17%	5.51%	10.09%
Southern Company	SO	$2.80	$68.47	4.00%	4.25%	4.50%	4.75%	5.00%	5.26%	5.51%	9.53%
Wisconsin Energy Corporation	WEC	$3.12	$86.53	5.80%	5.75%	5.70%	5.65%	5.60%	5.56%	5.51%	9.44%
Mean					5.54%	5.54%	5.53%	5.52%	5.51%	5.51%	9.53%
Median					5.79%	5.74%	5.68%	5.62%	5.56%	5.51%	9.48%

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[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
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MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **30** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$25.47	8.33%	7.86%	7.39%	6.92%	6.45%	5.98%	5.51%	10.47%
Ameren Corporation	AEE	$2.52	$76.88	6.43%	6.28%	6.12%	5.97%	5.82%	5.66%	5.51%	9.21%
Avista Corporation	AVA	$1.84	$33.32	5.93%	5.86%	5.79%	5.72%	5.65%	5.58%	5.51%	11.64%
CMS Energy Corporation	CMS	$1.95	$55.46	7.23%	6.95%	6.66%	6.37%	6.08%	5.79%	5.51%	9.68%
MGE Energy, Inc.	MGEE	$1.71	$72.34	5.73%	5.70%	5.66%	5.62%	5.58%	5.54%	5.51%	8.04%
NorthWestern Corporation	NWE	$2.56	$49.46	4.26%	4.47%	4.68%	4.88%	5.09%	5.30%	5.51%	10.72%
Southern Company	SO	$2.80	$68.05	5.87%	5.81%	5.75%	5.69%	5.63%	5.57%	5.51%	10.03%
Wisconsin Energy Corporation	WEC	$3.12	$81.41	5.90%	5.83%	5.77%	5.70%	5.64%	5.57%	5.51%	9.72%
Mean					6.09%	5.98%	5.86%	5.74%	5.62%	5.51%	9.94%
Median					5.85%	5.78%	5.71%	5.64%	5.58%	5.51%	9.87%

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[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **90** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$25.91	8.33%	7.86%	7.39%	6.92%	6.45%	5.98%	5.51%	10.39%
Ameren Corporation	AEE	$2.52	$78.29	6.43%	6.28%	6.12%	5.97%	5.82%	5.66%	5.51%	9.14%
Avista Corporation	AVA	$1.84	$33.50	5.93%	5.86%	5.79%	5.72%	5.65%	5.58%	5.51%	11.60%
CMS Energy Corporation	CMS	$1.95	$55.55	7.23%	6.95%	6.66%	6.37%	6.08%	5.79%	5.51%	9.67%
MGE Energy, Inc.	MGEE	$1.71	$72.89	5.73%	5.70%	5.66%	5.62%	5.58%	5.54%	5.51%	8.02%
NorthWestern Corporation	NWE	$2.56	$50.42	4.26%	4.47%	4.68%	4.88%	5.09%	5.30%	5.51%	10.61%
Southern Company	SO	$2.80	$67.52	5.87%	5.81%	5.75%	5.69%	5.63%	5.57%	5.51%	10.06%
Wisconsin Energy Corporation	WEC	$3.12	$82.96	5.90%	5.83%	5.77%	5.70%	5.64%	5.57%	5.51%	9.64%
Mean					6.09%	5.98%	5.86%	5.74%	5.62%	5.51%	9.89%
Median					5.85%	5.78%	5.71%	5.64%	5.58%	5.51%	9.87%

Notes:
[1] Bloomberg Professional
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[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **180** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$26.50	8.33%	7.86%	7.39%	6.92%	6.45%	5.98%	5.51%	10.28%
Ameren Corporation	AEE	$2.52	$81.27	6.43%	6.28%	6.12%	5.97%	5.82%	5.66%	5.51%	9.01%
Avista Corporation	AVA	$1.84	$36.89	5.93%	5.86%	5.79%	5.72%	5.65%	5.58%	5.51%	11.03%
CMS Energy Corporation	CMS	$1.95	$57.38	7.23%	6.95%	6.66%	6.37%	6.08%	5.79%	5.51%	9.54%
MGE Energy, Inc.	MGEE	$1.71	$74.47	5.73%	5.70%	5.66%	5.62%	5.58%	5.54%	5.51%	7.96%
NorthWestern Corporation	NWE	$2.56	$53.59	4.26%	4.47%	4.68%	4.88%	5.09%	5.30%	5.51%	10.30%
Southern Company	SO	$2.80	$68.47	5.87%	5.81%	5.75%	5.69%	5.63%	5.57%	5.51%	10.00%
Wisconsin Energy Corporation	WEC	$3.12	$86.53	5.90%	5.83%	5.77%	5.70%	5.64%	5.57%	5.51%	9.46%
Mean					6.09%	5.98%	5.86%	5.74%	5.62%	5.51%	9.70%
Median					5.85%	5.78%	5.71%	5.64%	5.58%	5.51%	9.77%

Notes:
[1] Bloomberg Professional
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[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **30** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$25.47	9.50%	8.83%	8.17%	7.50%	6.84%	6.17%	5.51%	10.80%
Ameren Corporation	AEE	$2.52	$76.88	6.60%	6.42%	6.24%	6.05%	5.87%	5.69%	5.51%	9.25%
Avista Corporation	AVA	$1.84	$33.32	6.00%	5.92%	5.84%	5.75%	5.67%	5.59%	5.51%	11.66%
CMS Energy Corporation	CMS	$1.95	$55.46	7.70%	7.33%	6.97%	6.60%	6.24%	5.87%	5.51%	9.79%
MGE Energy, Inc.	MGEE	$1.71	$72.34	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	8.17%
NorthWestern Corporation	NWE	$2.56	$49.46	5.20%	5.25%	5.30%	5.35%	5.40%	5.46%	5.51%	11.01%
Southern Company	SO	$2.80	$68.05	7.10%	6.83%	6.57%	6.30%	6.04%	5.77%	5.51%	10.36%
Wisconsin Energy Corporation	WEC	$3.12	$81.41	6.00%	5.92%	5.84%	5.75%	5.67%	5.59%	5.51%	9.74%
Mean					6.61%	6.39%	6.17%	5.95%	5.73%	5.51%	10.10%
Median					6.38%	6.20%	6.03%	5.85%	5.68%	5.51%	10.08%

Notes:
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[5] Equals [4] + ([9] − [3]) / 6
[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **90** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$25.91	9.50%	8.83%	8.17%	7.50%	6.84%	6.17%	5.51%	10.71%
Ameren Corporation	AEE	$2.52	$78.29	6.60%	6.42%	6.24%	6.05%	5.87%	5.69%	5.51%	9.18%
Avista Corporation	AVA	$1.84	$33.50	6.00%	5.92%	5.84%	5.75%	5.67%	5.59%	5.51%	11.62%
CMS Energy Corporation	CMS	$1.95	$55.55	7.70%	7.33%	6.97%	6.60%	6.24%	5.87%	5.51%	9.79%
MGE Energy, Inc.	MGEE	$1.71	$72.89	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	8.14%
NorthWestern Corporation	NWE	$2.56	$50.42	5.20%	5.25%	5.30%	5.35%	5.40%	5.46%	5.51%	10.90%
Southern Company	SO	$2.80	$67.52	7.10%	6.83%	6.57%	6.30%	6.04%	5.77%	5.51%	10.40%
Wisconsin Energy Corporation	WEC	$3.12	$82.96	6.00%	5.92%	5.84%	5.75%	5.67%	5.59%	5.51%	9.66%
Mean					6.61%	6.39%	6.17%	5.95%	5.73%	5.51%	10.05%
Median					6.38%	6.20%	6.03%	5.85%	5.68%	5.51%	10.09%

Notes:
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[3] Attachment AEB-4
[4] Equals [3] + ([9] − [3]) / 6
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[6] Equals [5] + ([9] − [3]) / 6
[7] Equals [6] + ([9] − [3]) / 6
[8] Equals [7] + ([9] − [3]) / 6
[9] Attachment AEB-5, page 19
[10] Equals internal rate of return of cash flows for Year 0 through Year 200

MULTI-STAGE DCF
COMBINATION UTILITY PROXY GROUP

AVERAGE FIRST STAGE GROWTH RATE
STOCK PRICE AVERAGING CONVENTION: **180** **DAYS**

		1	2	3	4	5	6	7	8	9	10
Company		Annualized Dividend	Stock Price	First Stage Gwth Rate	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth Rate	ROE
NiSource Inc.	NI	$1.00	$26.50	9.50%	8.83%	8.17%	7.50%	6.84%	6.17%	5.51%	10.60%
Ameren Corporation	AEE	$2.52	$81.27	6.60%	6.42%	6.24%	6.05%	5.87%	5.69%	5.51%	9.04%
Avista Corporation	AVA	$1.84	$36.89	6.00%	5.92%	5.84%	5.75%	5.67%	5.59%	5.51%	11.05%
CMS Energy Corporation	CMS	$1.95	$57.38	7.70%	7.33%	6.97%	6.60%	6.24%	5.87%	5.51%	9.65%
MGE Energy, Inc.	MGEE	$1.71	$74.47	6.50%	6.33%	6.17%	6.00%	5.84%	5.67%	5.51%	8.09%
NorthWestern Corporation	NWE	$2.56	$53.59	5.20%	5.25%	5.30%	5.35%	5.40%	5.46%	5.51%	10.57%
Southern Company	SO	$2.80	$68.47	7.10%	6.83%	6.57%	6.30%	6.04%	5.77%	5.51%	10.33%
Wisconsin Energy Corporation	WEC	$3.12	$86.53	6.00%	5.92%	5.84%	5.75%	5.67%	5.59%	5.51%	9.49%
Mean					6.61%	6.39%	6.17%	5.95%	5.73%	5.51%	9.85%
Median					6.38%	6.20%	6.03%	5.85%	5.68%	5.51%	9.99%

Notes:
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CALCULATION OF LONG-TERM GROWTH RATE FOR MULTI-STAGE DCF

Historical GDP Growth		
Real GDP ($ Billions) [1]	1929	$ 1,191.1
	2022	$ 21,822.0
Compound Annual Growth Rate		**3.18%**
Inflation Forecast		
Consumer Price Index (YoY % Change) [2]	2030-2034	2.20%
Consumer Price Index (All-Urban) [3]	2033	3.78
	2050	5.54
Compound Annual Growth Rate		2.27%
GDP Chain-type Price Index (2012=1.000) [3]	2033	1.65
	2050	2.43
Compound Annual Growth Rate		2.31%
Average Inflation Forecast		**2.26%**
Long-Term GDP Growth Rate		**5.51%**

Notes:

[1] Bureau of Economic Analysis, November 30, 2023

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

[3] Energy Information Administration, Annual Energy Outlook 2023 at Table 20, March 16, 2023

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND VALUE LINE BETA
NATURAL GAS UTILITY PROXY GROUP

$K = Rf + \beta (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.77%	0.85	12.56%	7.78%	11.39%	11.68%
NiSource Inc.	NI	4.77%	0.90	12.56%	7.78%	11.78%	11.97%
Northwest Natural Gas Company	NWN	4.77%	0.85	12.56%	7.78%	11.39%	11.68%
ONE Gas, Inc.	OGS	4.77%	0.85	12.56%	7.78%	11.39%	11.68%
Spire, Inc.	SR	4.77%	0.85	12.56%	7.78%	11.39%	11.68%
Mean						11.47%	11.74%
Median						11.39%	11.68%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2023
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR TERM PROJECTED RISK-FREE RATE AND VALUE LINE BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2024 - Q1 2025)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.48%	0.85	12.56%	8.08%	11.34%	11.65%
NiSource Inc.	NI	4.48%	0.90	12.56%	8.08%	11.75%	11.95%
Northwest Natural Gas Company	NWN	4.48%	0.85	12.56%	8.08%	11.34%	11.65%
ONE Gas, Inc.	OGS	4.48%	0.85	12.56%	8.08%	11.34%	11.65%
Spire, Inc.	SR	4.48%	0.85	12.56%	8.08%	11.34%	11.65%
Mean						11.43%	11.71%
Median						11.34%	11.65%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE AND VALUE LINE BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2025 - 2029)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.10%	0.85	12.56%	8.46%	11.29%	11.60%
NiSource Inc.	NI	4.10%	0.90	12.56%	8.46%	11.71%	11.92%
Northwest Natural Gas Company	NWN	4.10%	0.85	12.56%	8.46%	11.29%	11.60%
ONE Gas, Inc.	OGS	4.10%	0.85	12.56%	8.46%	11.29%	11.60%
Spire, Inc.	SR	4.10%	0.85	12.56%	8.46%	11.29%	11.60%
Mean						11.37%	11.67%
Median						11.29%	11.60%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND BLOOMBERG BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.77%	0.75	12.56%	7.78%	10.61%	11.10%
NiSource Inc.	NI	4.77%	0.81	12.56%	7.78%	11.09%	11.46%
Northwest Natural Gas Company	NWN	4.77%	0.71	12.56%	7.78%	10.26%	10.83%
ONE Gas, Inc.	OGS	4.77%	0.78	12.56%	7.78%	10.86%	11.28%
Spire, Inc.	SR	4.77%	0.77	12.56%	7.78%	10.78%	11.23%
Mean						10.72%	11.18%
Median						10.78%	11.23%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2023
[2] Bloomberg Professional
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR TERM PROJECTED RISK-FREE RATE AND BLOOMBERG BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2024 - Q1 2025)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.48%	0.75	12.56%	8.08%	10.54%	11.04%
NiSource Inc.	NI	4.48%	0.81	12.56%	8.08%	11.04%	11.42%
Northwest Natural Gas Company	NWN	4.48%	0.71	12.56%	8.08%	10.17%	10.77%
ONE Gas, Inc.	OGS	4.48%	0.78	12.56%	8.08%	10.80%	11.24%
Spire, Inc.	SR	4.48%	0.77	12.56%	8.08%	10.71%	11.17%
Mean						10.65%	11.13%
Median						10.71%	11.17%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[2] Bloomberg Professional
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE AND BLOOMBERG BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2025 - 2029)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.10%	0.75	12.56%	8.46%	10.45%	10.97%
NiSource Inc.	NI	4.10%	0.81	12.56%	8.46%	10.97%	11.37%
Northwest Natural Gas Company	NWN	4.10%	0.71	12.56%	8.46%	10.06%	10.69%
ONE Gas, Inc.	OGS	4.10%	0.78	12.56%	8.46%	10.71%	11.17%
Spire, Inc.	SR	4.10%	0.77	12.56%	8.46%	10.63%	11.11%
Mean						10.56%	11.06%
Median						10.63%	11.11%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[2] Bloomberg Professional
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND LONG-TERM VALUE LINE BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.77%	0.74	12.56%	7.78%	10.53%	11.04%
NiSource Inc.	NI	4.77%	0.74	12.56%	7.78%	10.51%	11.02%
Northwest Natural Gas Company	NWN	4.77%	0.70	12.56%	7.78%	10.22%	10.81%
ONE Gas, Inc.	OGS	4.77%	0.73	12.56%	7.78%	10.44%	10.97%
Spire, Inc.	SR	4.77%	0.73	12.56%	7.78%	10.46%	10.98%
Mean						10.43%	10.96%
Median						10.46%	10.98%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2023
[2] Source: LT Beta
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK FREE RATE AND LONG-TERM VALUE LINE BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2024 - Q1 2025)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.48%	0.74	12.56%	8.08%	10.46%	10.98%
NiSource Inc.	NI	4.48%	0.74	12.56%	8.08%	10.44%	10.97%
Northwest Natural Gas Company	NWN	4.48%	0.70	12.56%	8.08%	10.13%	10.74%
ONE Gas, Inc.	OGS	4.48%	0.73	12.56%	8.08%	10.36%	10.91%
Spire, Inc.	SR	4.48%	0.73	12.56%	8.08%	10.38%	10.92%
Mean						10.35%	10.90%
Median						10.38%	10.92%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[2] Source: LT Beta
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK FREE RATE AND LONG-TERM VALUE LINE BETA
NATURAL GAS UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2025 - 2029)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	4.10%	0.74	12.56%	8.46%	10.36%	10.91%
NiSource Inc.	NI	4.10%	0.74	12.56%	8.46%	10.34%	10.89%
Northwest Natural Gas Company	NWN	4.10%	0.70	12.56%	8.46%	10.02%	10.65%
ONE Gas, Inc.	OGS	4.10%	0.73	12.56%	8.46%	10.26%	10.83%
Spire, Inc.	SR	4.10%	0.73	12.56%	8.46%	10.27%	10.84%
Mean						10.25%	10.83%
Median						10.27%	10.84%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[2] Source: LT Beta
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND VALUE LINE BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.77%	0.90	12.56%	7.78%	11.78%	11.97%
Ameren Corporation	AEE	4.77%	0.85	12.56%	7.78%	11.39%	11.68%
Avista Corporation	AVA	4.77%	0.90	12.56%	7.78%	11.78%	11.97%
CMS Energy Corporation	CMS	4.77%	0.80	12.56%	7.78%	11.00%	11.39%
MGE Energy, Inc.	MGEE	4.77%	0.75	12.56%	7.78%	10.61%	11.10%
NorthWestern Corporation	NWE	4.77%	0.95	12.56%	7.78%	12.17%	12.26%
Southern Company	SO	4.77%	0.90	12.56%	7.78%	11.78%	11.97%
Wisconsin Energy Corporation	WEC	4.77%	0.80	12.56%	7.78%	11.00%	11.39%
Mean						11.44%	11.72%
Median						11.58%	11.83%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2023
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR TERM PROJECTED RISK-FREE RATE AND VALUE LINE BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2024 - Q1 2025)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.48%	0.90	12.56%	8.08%	11.75%	11.95%
Ameren Corporation	AEE	4.48%	0.85	12.56%	8.08%	11.34%	11.65%
Avista Corporation	AVA	4.48%	0.90	12.56%	8.08%	11.75%	11.95%
CMS Energy Corporation	CMS	4.48%	0.80	12.56%	8.08%	10.94%	11.34%
MGE Energy, Inc.	MGEE	4.48%	0.75	12.56%	8.08%	10.54%	11.04%
NorthWestern Corporation	NWE	4.48%	0.95	12.56%	8.08%	12.15%	12.25%
Southern Company	SO	4.48%	0.90	12.56%	8.08%	11.75%	11.95%
Wisconsin Energy Corporation	WEC	4.48%	0.80	12.56%	8.08%	10.94%	11.34%
Mean						11.40%	11.69%
Median						11.55%	11.80%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE AND VALUE LINE BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2025 - 2029)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.10%	0.90	12.56%	8.46%	11.71%	11.92%
Ameren Corporation	AEE	4.10%	0.85	12.56%	8.46%	11.29%	11.60%
Avista Corporation	AVA	4.10%	0.90	12.56%	8.46%	11.71%	11.92%
CMS Energy Corporation	CMS	4.10%	0.80	12.56%	8.46%	10.86%	11.29%
MGE Energy, Inc.	MGEE	4.10%	0.75	12.56%	8.46%	10.44%	10.97%
NorthWestern Corporation	NWE	4.10%	0.95	12.56%	8.46%	12.13%	12.24%
Southern Company	SO	4.10%	0.90	12.56%	8.46%	11.71%	11.92%
Wisconsin Energy Corporation	WEC	4.10%	0.80	12.56%	8.46%	10.86%	11.29%
Mean						11.34%	11.64%
Median						11.50%	11.76%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND BLOOMBERG BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.77%	0.81	12.56%	7.78%	11.09%	11.46%
Ameren Corporation	AEE	4.77%	0.75	12.56%	7.78%	10.61%	11.10%
Avista Corporation	AVA	4.77%	0.76	12.56%	7.78%	10.70%	11.16%
CMS Energy Corporation	CMS	4.77%	0.75	12.56%	7.78%	10.58%	11.08%
MGE Energy, Inc.	MGEE	4.77%	0.68	12.56%	7.78%	10.08%	10.70%
NorthWestern Corporation	NWE	4.77%	0.87	12.56%	7.78%	11.52%	11.78%
Southern Company	SO	4.77%	0.77	12.56%	7.78%	10.80%	11.24%
Wisconsin Energy Corporation	WEC	4.77%	0.73	12.56%	7.78%	10.47%	10.99%
Mean						10.73%	11.19%
Median						10.65%	11.13%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2023
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR TERM PROJECTED RISK-FREE RATE AND BLOOMBERG BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2024 - Q1 2025)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.48%	0.81	12.56%	8.08%	11.04%	11.42%
Ameren Corporation	AEE	4.48%	0.75	12.56%	8.08%	10.53%	11.04%
Avista Corporation	AVA	4.48%	0.76	12.56%	8.08%	10.63%	11.11%
CMS Energy Corporation	CMS	4.48%	0.75	12.56%	8.08%	10.51%	11.02%
MGE Energy, Inc.	MGEE	4.48%	0.68	12.56%	8.08%	9.99%	10.63%
NorthWestern Corporation	NWE	4.48%	0.87	12.56%	8.08%	11.48%	11.75%
Southern Company	SO	4.48%	0.77	12.56%	8.08%	10.74%	11.19%
Wisconsin Energy Corporation	WEC	4.48%	0.73	12.56%	8.08%	10.39%	10.93%
Mean						10.66%	11.14%
Median						10.58%	11.08%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE AND BLOOMBERG BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2025 - 2029)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.10%	0.81	12.56%	8.46%	10.97%	11.37%
Ameren Corporation	AEE	4.10%	0.75	12.56%	8.46%	10.44%	10.97%
Avista Corporation	AVA	4.10%	0.76	12.56%	8.46%	10.54%	11.04%
CMS Energy Corporation	CMS	4.10%	0.75	12.56%	8.46%	10.41%	10.95%
MGE Energy, Inc.	MGEE	4.10%	0.68	12.56%	8.46%	9.87%	10.54%
NorthWestern Corporation	NWE	4.10%	0.87	12.56%	8.46%	11.43%	11.71%
Southern Company	SO	4.10%	0.77	12.56%	8.46%	10.65%	11.13%
Wisconsin Energy Corporation	WEC	4.10%	0.73	12.56%	8.46%	10.29%	10.85%
Mean						10.57%	11.07%
Median						10.49%	11.01%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND LONG-TERM VALUE LINE BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.77%	0.74	12.56%	7.78%	10.51%	11.02%
Ameren Corporation	AEE	4.77%	0.73	12.56%	7.78%	10.42%	10.95%
Avista Corporation	AVA	4.77%	0.79	12.56%	7.78%	10.88%	11.30%
CMS Energy Corporation	CMS	4.77%	0.69	12.56%	7.78%	10.14%	10.75%
MGE Energy, Inc.	MGEE	4.77%	0.69	12.56%	7.78%	10.10%	10.72%
NorthWestern Corporation	NWE	4.77%	0.75	12.56%	7.78%	10.57%	11.07%
Southern Company	SO	4.77%	0.66	12.56%	7.78%	9.87%	10.54%
Wisconsin Energy Corporation	WEC	4.77%	0.66	12.56%	7.78%	9.91%	10.57%
Mean						10.30%	10.87%
Median						10.28%	10.85%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2023
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND LONG-TERM VALUE LINE BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2024 - Q1 2025)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.48%	0.74	12.56%	8.08%	10.44%	10.97%
Ameren Corporation	AEE	4.48%	0.73	12.56%	8.08%	10.34%	10.89%
Avista Corporation	AVA	4.48%	0.79	12.56%	8.08%	10.82%	11.25%
CMS Energy Corporation	CMS	4.48%	0.69	12.56%	8.08%	10.05%	10.68%
MGE Energy, Inc.	MGEE	4.48%	0.69	12.56%	8.08%	10.01%	10.65%
NorthWestern Corporation	NWE	4.48%	0.75	12.56%	8.08%	10.50%	11.01%
Southern Company	SO	4.48%	0.66	12.56%	8.08%	9.77%	10.47%
Wisconsin Energy Corporation	WEC	4.48%	0.66	12.56%	8.08%	9.81%	10.50%
Mean						10.22%	10.80%
Median						10.19%	10.78%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK FREE RATE AND LONG-TERM VALUE LINE BETA
COMBINED UTILITY PROXY GROUP

$$K = Rf + \beta (Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2025 - 2029)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
NiSource Inc.	NI	4.10%	0.74	12.56%	8.46%	10.34%	10.89%
Ameren Corporation	AEE	4.10%	0.73	12.56%	8.46%	10.23%	10.81%
Avista Corporation	AVA	4.10%	0.79	12.56%	8.46%	10.74%	11.19%
CMS Energy Corporation	CMS	4.10%	0.69	12.56%	8.46%	9.93%	10.59%
MGE Energy, Inc.	MGEE	4.10%	0.69	12.56%	8.46%	9.89%	10.56%
NorthWestern Corporation	NWE	4.10%	0.75	12.56%	8.46%	10.40%	10.94%
Southern Company	SO	4.10%	0.66	12.56%	8.46%	9.64%	10.37%
Wisconsin Energy Corporation	WEC	4.10%	0.66	12.56%	8.46%	9.68%	10.40%
Mean						10.11%	10.72%
Median						10.08%	10.70%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[2] Value Line
[3] Market Return
[4] Equals [3]-[1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

HISTORICAL VALUE LINE BETA

Company	Ticker	[1] 12/31/2013	[2] 12/31/2014	[3] 12/31/2015	[4] 12/31/2016	[5] 12/31/2017	[6] 12/31/2018	[7] 12/31/2019	[8] 12/31/2020	[9] 12/31/2021	[10] 12/31/2022	[11] Average
Atmos Energy Corporation	ATO	0.80	0.80	0.80	0.70	0.70	0.60	0.60	0.80	0.80	0.80	0.74
NiSource Inc.	NI	0.85	0.85	NMF	NMF	0.60	0.50	0.55	0.85	0.85	0.85	0.74
Northwest Natural Gas Company	NWN	0.65	0.70	0.65	0.65	0.70	0.60	0.60	0.80	0.85	0.80	0.70
ONE Gas, Inc.	OGS				0.70	0.70	0.65	0.65	0.80	0.80	0.80	0.73
Spire, Inc.	SR	0.65	0.70	0.70	0.70	0.70	0.65	0.65	0.85	0.85	0.85	0.73
Ameren Corporation	AEE	0.80	0.75	0.75	0.65	0.70	0.55	0.55	0.85	0.80	0.85	0.73
Avista Corporation	AVA	0.75	0.80	0.80	0.70	0.75	0.65	0.60	0.95	0.95	0.90	0.79
CMS Energy Corporation	CMS	0.70	0.70	0.75	0.65	0.65	0.55	0.50	0.80	0.80	0.80	0.69
MGE Energy, Inc.	MGEE	0.65	0.70	0.75	0.70	0.75	0.60	0.55	0.70	0.75	0.70	0.69
NorthWestern Corporation	NWE	0.70	0.70	0.70	0.70	0.70	0.55	0.60	0.95	0.95	0.90	0.75
Southern Company	SO	0.55	0.55	0.60	0.55	0.55	0.50	0.50	0.90	0.95	0.90	0.66
Wisconsin Energy Corporation	WEC	0.65	0.65	0.70	0.60	0.60	0.50	0.50	0.80	0.80	0.80	0.66
Mean		0.70	0.72	0.72	0.66	0.68	0.58	0.57	0.84	0.85	0.83	0.72

Notes:

[1] Value Line, December 26, 2013
[2] Value Line, December 31, 2014
[3] Value Line, December 30, 2015
[4] Value Line, December 29, 2016
[5] Value Line, December 28, 2017
[6] Value Line, December 27, 2018
[7] Value Line, December 26, 2019
[8] Value Line, December 30, 2020
[9] Value Line, December 29, 2021
[10] Value Line, December 30, 2022
[11] Average ([1] - [10])

MARKET RISK PREMIUM DERIVED FROM S&P 500 INDEX

[1] Estimate of the S&P 500 Dividend Yield	1.69%
[2] Estimate of the S&P 500 Growth Rate	10.78%
[3] S&P 500 Estimated Required Market Return	12.56%

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	324.362	95.1	30,846.83	0.11%	5.26%	0.01%	8.00%	0.01%
American Express Co	AXP	728.746	170.77	124,447.95	0.42%	1.41%	0.01%	14.01%	0.06%
Verizon Communications Inc	VZ	4204.102	38.33	161,143.23		6.94%			
Broadcom Inc	AVGO	469.426	925.73	434,561.73	1.48%	1.99%	0.03%	13.89%	0.21%
Boeing Co/The	BA	604.977	231.63	140,130.82				183.61%	
Caterpillar Inc	CAT	509.085	250.72	127,637.79	0.43%	2.07%	0.01%	20.00%	0.09%
JPMorgan Chase & Co	JPM	2891.008	156.08	451,228.53	1.54%	2.69%	0.04%	1.00%	0.02%
Chevron Corp	CVX	1887.749	143.6	271,080.76	0.92%	4.21%	0.04%	7.27%	0.07%
Coca-Cola Co/The	KO	4323.414	58.44	252,660.31	0.86%	3.15%	0.03%	6.51%	0.06%
AbbVie Inc	ABBV	1765.537	142.39	251,394.81	0.86%	4.35%	0.04%	0.19%	0.00%
Walt Disney Co/The	DIS	1830.316	92.69	169,651.99	0.58%	0.65%	0.00%	18.88%	0.11%
FleetCor Technologies Inc	FLT	72.204	240.5	17,365.06	0.06%			12.92%	0.01%
Extra Space Storage Inc	EXR	211.278	130.17	27,502.06	0.09%	4.98%	0.00%	1.10%	0.00%
Exxon Mobil Corp	XOM	4006.133	102.74	411,590.10		3.70%		45.59%	
Phillips 66	PSX	439.956	128.89	56,705.93	0.19%	3.26%	0.01%	15.21%	0.03%
General Electric Co	GE	1088.386	121.8	132,565.41		0.26%		22.50%	
HP Inc	HPQ	988.269	29.34	28,995.81	0.10%	3.76%	0.00%	3.00%	0.00%
Home Depot Inc/The	HD	995.262	313.49	312,004.68	1.06%	2.67%	0.03%	1.69%	0.02%
Monolithic Power Systems Inc	MPWR	47.912	548.72	26,290.27	0.09%	0.73%	0.00%	8.00%	0.01%
International Business Machines Corp	IBM	913.119	158.56	144,784.15	0.49%	4.19%	0.02%	2.77%	0.01%
Johnson & Johnson	JNJ	2407.279	154.66	372,309.77	1.27%	3.08%	0.04%	3.86%	0.05%
Lululemon Athletica Inc	LULU	121.425	446.8	54,252.69	0.18%			16.00%	0.03%
McDonald's Corp	MCD	725.342	281.84	204,430.39	0.70%	2.37%	0.02%	9.34%	0.07%
Merck & Co Inc	MRK	2534.023	102.48	259,686.68	0.88%	3.01%	0.03%	9.08%	0.08%
3M Co	MMM	552.317	99.07	54,718.05	0.19%	6.06%	0.01%	4.00%	0.01%
American Water Works Co Inc	AWK	194.705	131.84	25,669.91	0.09%	2.15%	0.00%	8.00%	0.01%
Bank of America Corp	BAC	7913.732	30.49	241,289.69		3.15%		-5.00%	
Pfizer Inc	PFE	5646.413	30.47	172,046.20		5.38%		50.40%	
Procter & Gamble Co/The	PG	2356.886	153.52	361,829.14	1.23%	2.45%	0.03%	7.51%	0.09%
AT&T Inc	T	7150.02	16.57	118,475.83	0.40%	6.70%	0.03%	3.36%	0.01%
Travelers Cos Inc/The	TRV	228.399	180.62	41,253.43	0.14%	2.21%	0.00%	15.33%	0.02%
RTX Corp	RTX	1437.901	81.48	117,160.17	0.40%	2.90%	0.01%	8.61%	0.03%
Analog Devices Inc	ADI	496.262	182.5199	90,577.69	0.31%	1.88%	0.01%	4.50%	0.01%
Walmart Inc	WMT	2692.234	155.69	419,153.91	1.43%	1.46%	0.02%	3.00%	0.04%
Cisco Systems Inc	CSCO	4063.476	48.38	196,590.97	0.67%	3.22%	0.02%	10.00%	0.07%
Intel Corp	INTC	4216	44.7	188,455.20		1.12%		-1.82%	
General Motors Co	GM	1369.481	31.6	43,275.60		1.14%		-4.65%	
Microsoft Corp	MSFT	7432.262	378.91	2,816,158.39	9.59%	0.79%	0.08%	15.72%	1.51%
Dollar General Corp	DG	219.476	131.12	28,777.69		1.80%		-2.50%	
Cigna Group/The	CI	292.62	262.88	76,923.95	0.26%	1.87%	0.00%	9.80%	0.03%
Kinder Morgan Inc	KMI	2222.774	17.57	39,054.14	0.13%	6.43%	0.01%	2.00%	0.00%
Citigroup Inc	C	1913.882	46.1	88,229.96		4.60%		-9.70%	
American International Group Inc	AIG	702.04	65.81	46,201.25	0.16%	2.19%	0.00%	10.00%	0.02%
Altria Group Inc	MO	1768.647	42.04	74,353.92	0.25%	9.32%	0.02%	4.50%	0.01%
HCA Healthcare Inc	HCA	267.661	250.48	67,043.73	0.23%	0.96%	0.00%	7.56%	0.02%
International Paper Co	IP	346.017	36.94	12,781.87		5.01%		-2.00%	
Hewlett Packard Enterprise Co	HPE	1283	16.91	21,695.53	0.07%	3.08%	0.00%	3.03%	0.00%
Abbott Laboratories	ABT	1736.059	104.29	181,053.59	0.62%	1.96%	0.01%	3.27%	0.02%
Aflac Inc	AFL	584.38	82.71	48,334.07	0.16%	2.42%	0.00%	8.04%	0.01%
Air Products and Chemicals Inc	APD	222.208	270.55	60,118.37	0.20%	2.59%	0.01%	12.55%	0.03%
Royal Caribbean Cruises Ltd	RCL	256.235	107.46	27,535.01					
Hess Corp	HES	307.152	140.56	43,173.29	0.15%	1.25%	0.00%	13.00%	0.02%
Archer-Daniels-Midland Co	ADM	533.381	73.73	39,326.18		2.44%		-7.07%	
Automatic Data Processing Inc	ADP	411.305	229.92	94,567.25	0.32%	2.44%	0.01%	16.00%	0.05%
Verisk Analytics Inc	VRSK	144.987	241.43	35,004.21	0.12%	0.56%	0.00%	12.15%	0.01%
AutoZone Inc	AZO	17.634	2609.93	46,023.51	0.16%			13.72%	0.02%
Linde PLC	LIN	484.89	412.4952	200,014.80	0.68%	1.24%	0.01%	14.00%	0.10%
Avery Dennison Corp	AVY	80.531	194.5	15,663.28	0.05%	1.67%	0.00%	7.00%	0.00%
Enphase Energy Inc	ENPH	136.551	101.02	13,794.38				28.59%	
MSCI Inc	MSCI	79.091	520.85	41,194.55	0.14%	1.06%	0.00%	14.48%	0.02%
Ball Corp	BALL	315.301	55.29	17,432.99	0.06%	1.45%	0.00%	10.30%	0.01%
Axon Enterprise Inc	AXON	74.934	229.87	17,225.08					
Ceridian HCM Holding Inc	CDAY	156.127	68.9	10,757.15					
Carrier Global Corp	CARR	839.047	51.96	43,596.88	0.15%	1.42%	0.00%	10.80%	0.02%
Bank of New York Mellon Corp/The	BK	769.073	48.32	37,161.61	0.13%	3.48%	0.00%	10.00%	0.01%
Otis Worldwide Corp	OTIS	409.259	85.79	35,110.33	0.12%	1.59%	0.00%	9.00%	0.01%
Baxter International Inc	BAX	507.324	36.08	18,304.25		3.22%		-1.17%	
Becton Dickinson & Co	BDX	290.405	236.18	68,587.85		1.61%		-2.02%	
Berkshire Hathaway Inc	BRK/B	1308.414	360	471,029.04					
Best Buy Co Inc	BBY	217.638	70.94	15,439.24	0.05%	5.19%	0.00%	2.93%	0.00%
Boston Scientific Corp	BSX	1464.983	55.89	81,877.90	0.28%			12.10%	0.03%
Bristol-Myers Squibb Co	BMY	2034.758	49.38	100,476.35	0.34%	4.62%	0.02%	9.92%	0.03%
Brown-Forman Corp	BF/B	310.136	58.74	18,217.39	0.06%	1.48%	0.00%	6.42%	0.00%
Coterra Energy Inc	CTRA	752.192	26.25	19,745.04		3.05%		55.04%	
Campbell Soup Co	CPB	297.622	40.18	11,958.45	0.04%	3.68%	0.00%	2.81%	0.00%
Hilton Worldwide Holdings Inc	HLT	256.44	167.52	42,958.83	0.15%	0.36%	0.00%	17.09%	0.03%
Carnival Corp	CCL	1119.445	15.06	16,858.84					
Qorvo Inc	QRVO	97.346	96.5	9,393.89	0.03%			10.04%	0.00%
UDR Inc	UDR	328.928	33.4	10,986.20	0.04%	5.03%	0.00%	6.08%	0.00%
Clorox Co/The	CLX	124.059	143.35	17,783.86	0.06%	3.35%	0.00%	11.53%	0.01%
Paycom Software Inc	PAYC	60.228	181.66	10,941.02	0.04%	0.83%	0.00%	15.19%	0.01%
CMS Energy Corp	CMS	291.764	56.76	16,560.52	0.06%	3.44%	0.00%	7.75%	0.00%
Colgate-Palmolive Co	CL	823.372	78.77	64,857.01	0.22%	2.44%	0.01%	7.21%	0.02%

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
EPAM Systems Inc	EPAM	57.7	258.19	14,897.56	0.05%			4.87%	0.00%
Comerica Inc	CMA	131.873	45.22	5,963.30	0.02%	6.28%	0.00%	10.63%	0.00%
Conagra Brands Inc	CAG	477.968	28.29	13,521.71	0.05%	4.95%	0.00%	0.84%	0.00%
Airbnb Inc	ABNB	434.745	126.34	54,925.68	0.19%			18.20%	0.03%
Consolidated Edison Inc	ED	344.924	90.11	31,081.10	0.11%	3.60%	0.00%	4.88%	0.01%
Corning Inc	GLW	853.175	28.49	24,306.96	0.08%	3.93%	0.00%	1.57%	0.00%
Cummins Inc	CMI	141.745	224.16	31,773.56	0.11%	3.00%	0.00%	9.15%	0.01%
Caesars Entertainment Inc	CZR	215.711	44.72	9,646.60				110.92%	
Danaher Corp	DHR	738.927	223.31	165,009.79		0.48%		-7.03%	
Target Corp	TGT	461.662	133.81	61,774.99	0.21%	3.29%	0.01%	0.15%	0.00%
Deere & Co	DE	288.001	364.41	104,950.44	0.36%	1.48%	0.01%	3.96%	0.01%
Dominion Energy Inc	D	836.773	45.34	37,939.29		5.89%		-0.72%	
Dover Corp	DOV	139.89	141.16	19,746.87	0.07%	1.45%	0.00%	10.00%	0.01%
Alliant Energy Corp	LNT	252.719	50.57	12,780.00	0.04%	3.58%	0.00%	6.26%	0.00%
Steel Dynamics Inc	STLD	161.816	119.13	19,277.14		1.43%		-13.17%	
Duke Energy Corp	DUK	771	92.28	71,147.88	0.24%	4.44%	0.01%	6.06%	0.01%
Regency Centers Corp	REG	184.576	62.78	11,587.68	0.04%	4.27%	0.00%	4.64%	0.00%
Eaton Corp PLC	ETN	399.3	227.69	90,916.62	0.31%	1.51%	0.00%	15.00%	0.05%
Ecolab Inc	ECL	285.14	191.73	54,669.89	0.19%	1.11%	0.00%	16.00%	0.03%
Revvity Inc	RVTY	123.407	88.9	10,970.88		0.31%		-26.69%	
Emerson Electric Co	EMR	570.1	88.9	50,681.89	0.17%	2.36%	0.00%	12.01%	0.02%
EOG Resources Inc	EOG	583.15	123.07	71,768.27	0.24%	2.96%	0.01%	17.83%	0.04%
Aon PLC	AON	200.216	328.49	65,768.95	0.22%	0.75%	0.00%	11.58%	0.03%
Entergy Corp	ETR	211.456	101.41	21,443.75	0.07%	4.46%	0.00%	6.22%	0.00%
Equifax Inc	EFX	123.217	217.71	26,825.57	0.09%	0.72%	0.00%	12.33%	0.01%
EQT Corp	EQT	411.332	39.96	16,436.83		1.58%		20.04%	
IQVIA Holdings Inc	IQV	182.5	214.1	39,073.25				-13.67%	
Gartner Inc	IT	77.949	434.84	33,895.34	0.12%			7.35%	0.01%
FedEx Corp	FDX	251.42	258.83	65,075.04	0.22%	1.95%	0.00%	14.50%	0.03%
FMC Corp	FMC	124.759	53.66	6,694.57		4.32%		-4.00%	
Brown & Brown Inc	BRO	284.598	74.74	21,270.85	0.07%	0.70%	0.00%	11.00%	0.01%
Ford Motor Co	F	3932.102	10.26	40,343.37		5.85%		-2.52%	
NextEra Energy Inc	NEE	2023.714	58.51	118,407.51	0.40%	3.20%	0.01%	8.10%	0.03%
Franklin Resources Inc	BEN	494.584	24.8	12,265.68		4.84%		-9.00%	
Garmin Ltd	GRMN	191.331	122.24	23,388.30	0.08%	2.39%	0.00%	5.60%	0.00%
Freeport-McMoRan Inc	FCX	1433.977	37.32	53,516.02		1.61%		-15.66%	
Dexcom Inc	DXCM	386.374	115.52	44,633.92				30.59%	
General Dynamics Corp	GD	272.897	246.97	67,397.37	0.23%	2.14%	0.00%	10.40%	0.02%
General Mills Inc	GIS	581.279	63.66	37,004.22	0.13%	3.71%	0.00%	8.00%	0.01%
Genuine Parts Co	GPC	140.197	132.78	18,615.36	0.06%	2.86%	0.00%	9.49%	0.01%
Atmos Energy Corp	ATO	148.496	113.81	16,900.33	0.06%	2.83%	0.00%	7.25%	0.00%
WW Grainger Inc	GWW	49.634	786.19	39,021.75		0.95%			
Halliburton Co	HAL	895.052	37.03	33,143.78		1.73%		24.14%	
L3Harris Technologies Inc	LHX	189.54	190.81	36,166.13	0.12%	2.39%	0.00%	3.50%	0.00%
Healthpeak Properties Inc	PEAK	547.074	17.32	9,475.32	0.03%	6.93%	0.00%	1.24%	0.00%
Insulet Corp	PODD	69.828	189.09	13,203.78				41.08%	
Catalent Inc	CTLT	180.272	38.85	7,003.57	0.02%			9.24%	0.00%
Fortive Corp	FTV	351.434	68.98	24,241.92	0.08%	0.46%	0.00%	8.68%	0.01%
Hershey Co/The	HSY	149.885	187.92	28,166.39	0.10%	2.54%	0.00%	9.00%	0.01%
Synchrony Financial	SYF	413.804	32.36	13,390.70		3.09%			
Hormel Foods Corp	HRL	546.481	30.59	16,716.85	0.06%	3.69%	0.00%	1.08%	0.00%
Arthur J Gallagher & Co	AJG	215.9	249	53,759.10	0.18%	0.88%	0.00%	14.11%	0.03%
Mondelez International Inc	MDLZ	1360.896	71.06	96,705.27	0.33%	2.39%	0.01%	9.17%	0.03%
CenterPoint Energy Inc	CNP	629.432	28.27	17,794.04	0.06%	2.83%	0.00%	8.02%	0.00%
Humana Inc	HUM	123.111	484.86	59,691.60	0.20%	0.73%	0.00%	12.32%	0.03%
Willis Towers Watson PLC	WTW	103.26	246.3	25,432.94	0.09%	1.36%	0.00%	11.19%	0.01%
Illinois Tool Works Inc	ITW	300.886	242.21	72,877.60	0.25%	2.31%	0.01%	3.91%	0.01%
CDW Corp/DE	CDW	133.96	210.88	28,249.48	0.10%	1.18%	0.00%	13.10%	0.01%
Trane Technologies PLC	TT	227.557	225.41	51,293.62	0.17%	1.33%	0.00%	13.29%	0.02%
Interpublic Group of Cos Inc/The	IPG	383.004	30.74	11,773.54	0.04%	4.03%	0.00%	5.71%	0.00%
International Flavors & Fragrances Inc	IFF	255.279	75.38	19,242.93	0.07%	4.30%	0.00%	5.50%	0.00%
Generac Holdings Inc	GNRC	61.432	117.07	7,191.84	0.02%			5.00%	0.00%
NXP Semiconductors NV	NXPI	257.763	204.08	52,604.27		1.99%		34.00%	
Kellanova	K	342.52	52.54	17,996.00	0.06%	4.26%	0.00%	1.69%	0.00%
Broadridge Financial Solutions Inc	BR	117.647	193.82	22,802.34		1.65%			
Kimberly-Clark Corp	KMB	337.941	123.73	41,813.44	0.14%	3.81%	0.01%	9.64%	0.01%
Kimco Realty Corp	KIM	619.892	19.32	11,976.31	0.04%	4.97%	0.00%	4.35%	0.00%
Oracle Corp	ORCL	2739.376	116.21	318,342.88	1.08%	1.38%	0.01%	14.45%	0.16%
Kroger Co/The	KR	719.316	44.27	31,844.12	0.11%	2.62%	0.00%	4.21%	0.00%
Lennar Corp	LEN	250.152	127.92	31,999.44	0.11%	1.17%	0.00%	1.00%	0.00%
Eli Lilly & Co	LLY	949.307	591.04	561,078.41		0.76%		21.47%	
Bath & Body Works Inc	BBWI	227.381	32.62	7,417.17	0.03%	2.45%	0.00%	6.51%	0.00%
Charter Communications Inc	CHTR	147.92	400.13	59,187.23	0.20%			12.31%	0.02%
Loews Corp	L	223.251	70.29	15,692.31		0.36%			
Lowe's Cos Inc	LOW	575.113	198.83	114,349.72		2.21%		20.20%	
Hubbell Inc	HUBB	53.622	300	16,086.60		1.63%			
IDEX Corp	IEX	75.626	201.68	15,252.25	0.05%	1.27%	0.00%	11.00%	0.01%
Marsh & McLennan Cos Inc	MMC	493.072	199.42	98,328.42	0.33%	1.42%	0.00%	11.53%	0.04%
Masco Corp	MAS	224.501	60.55	13,593.54	0.05%	1.88%	0.00%	4.36%	0.00%
S&P Global Inc	SPGI	316.8	415.83	131,734.94	0.45%	0.87%	0.00%	13.66%	0.06%
Medtronic PLC	MDT	1329.654	79.27	105,401.67	0.36%	3.48%	0.01%	4.33%	0.02%
Viatris Inc	VTRS	1199.671	9.18	11,012.98		5.23%		-2.58%	
CVS Health Corp	CVS	1286.897	67.95	87,444.65	0.30%	3.56%	0.01%	6.99%	0.02%
DuPont de Nemours Inc	DD	430.042	71.54	30,765.20	0.10%	2.01%	0.00%	11.43%	0.01%
Micron Technology Inc	MU	1098.034	76.12	83,582.35		0.60%		-11.00%	
Motorola Solutions Inc	MSI	165.968	322.87	53,586.09	0.18%	1.21%	0.00%	10.82%	0.02%
Cboe Global Markets Inc	CBOE	105.556	182.19	19,231.25	0.07%	1.21%	0.00%	10.21%	0.01%
Laboratory Corp of America Holdings	LH	84.9	216.91	18,415.66		1.33%		-32.45%	
Newmont Corp	NEM	1152.492	40.19	46,318.65	0.16%	3.98%	0.01%	11.58%	0.02%
NIKE Inc	NKE	1224.013	109.9	134,519.03	0.46%	1.35%	0.01%	16.07%	0.07%
NiSource Inc	NI	413.415	25.64	10,599.96	0.04%	3.90%	0.00%	7.65%	0.00%
Norfolk Southern Corp	NSC	226.136	218.16	49,333.83	0.17%	2.48%	0.00%	0.73%	0.00%

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Principal Financial Group Inc	PFG	238.412	73.83	17,601.96	0.06%	3.63%	0.00%	8.98%	0.01%
Eversource Energy	ES	349.086	59.41	20,739.20	0.07%	4.54%	0.00%	5.21%	0.00%
Northrop Grumman Corp	NOC	150.793	475.16	71,650.80	0.24%	1.57%	0.00%	2.53%	0.01%
Wells Fargo & Co	WFC	3631.64	44.59	161,934.83	0.55%	3.14%	0.02%	13.41%	0.07%
Nucor Corp	NUE	245.839	169.97	41,785.25		1.20%		-10.84%	
Occidental Petroleum Corp	OXY	880.371	59.15	52,073.94		1.22%			
Omnicom Group Inc	OMC	197.934	80.63	15,959.42	0.05%	3.47%	0.00%	4.72%	0.00%
ONEOK Inc	OKE	582.551	68.85	40,108.64	0.14%	5.55%	0.01%	6.93%	0.01%
Raymond James Financial Inc	RJF	208.607	105.15	21,935.03		1.71%			
PG&E Corp	PCG	2133.508	17.17	36,632.33	0.12%	0.23%	0.00%	6.26%	0.01%
Parker-Hannifin Corp	PH	128.476	433.18	55,653.23	0.19%	1.37%	0.00%	15.28%	0.03%
Rollins Inc	ROL	484.038	40.74	19,719.71	0.07%	1.47%	0.00%	14.86%	0.01%
PPL Corp	PPL	737.089	26.12	19,252.76	0.07%	3.68%	0.00%	4.20%	0.00%
ConocoPhillips	COP	1187.408	115.57	137,228.74	0.47%	0.50%	0.00%	6.00%	0.03%
PulteGroup Inc	PHM	215.595	88.42	19,062.91	0.06%	0.90%	0.00%	2.04%	0.00%
Pinnacle West Capital Corp	PNW	113.312	74.94	8,491.60	0.03%	4.70%	0.00%	5.95%	0.00%
PNC Financial Services Group Inc/The	PNC	398.341	133.96	53,361.76	0.18%	4.63%	0.01%	12.87%	0.02%
PPG Industries Inc	PPG	235.8	141.99	33,481.24	0.11%	1.83%	0.00%	12.91%	0.01%
Progressive Corp/The	PGR	585.041	164.03	95,964.28		0.24%		39.34%	
Veralto Corp	VLTO	246.308	77.25	19,027.29					
Public Service Enterprise Group Inc	PEG	499.111	62.43	31,159.50	0.11%	3.65%	0.00%	5.47%	0.01%
Robert Half Inc	RHI	105.895	81.98	8,681.27	0.03%	2.34%	0.00%	1.26%	0.00%
Cooper Cos Inc/The	COO	49.524	336.92	16,685.63	0.06%	0.02%	0.00%	7.54%	0.00%
Edison International	EIX	383.568	66.99	25,695.22	0.09%	4.40%	0.00%	4.80%	0.00%
Schlumberger NV	SLB	1423.421	52.04	74,074.83		1.92%		33.41%	
Charles Schwab Corp/The	SCHW	1771.682	61.32	108,639.54	0.37%	1.63%	0.01%	3.60%	0.01%
Sherwin-Williams Co/The	SHW	255.966	278.8	71,363.32	0.24%	0.87%	0.00%	10.90%	0.03%
West Pharmaceutical Services Inc	WST	73.99	350.76	25,952.73	0.09%	0.23%	0.00%	5.80%	0.01%
J M Smucker Co/The	SJM	106.133	109.73	11,645.97	0.04%	3.86%	0.00%	5.95%	0.00%
Snap-on Inc	SNA	52.78	274.69	14,498.14	0.05%	2.71%	0.00%	4.85%	0.00%
AMETEK Inc	AME	230.799	155.23	35,826.93	0.12%	0.64%	0.00%	6.36%	0.01%
Southern Co/The	SO	1091.515	70.98	77,475.73	0.26%	3.94%	0.01%	5.05%	0.01%
Truist Financial Corp	TFC	1333.668	32.14	42,864.09	0.15%	6.47%	0.01%	16.00%	0.02%
Southwest Airlines Co	LUV	596.115	25.57	15,242.66	0.05%	2.82%	0.00%	10.15%	0.01%
W R Berkley Corp	WRB	257.872	72.55	18,708.61	0.06%	0.61%	0.00%	13.00%	0.01%
Stanley Black & Decker Inc	SWK	153.311	90.9	13,935.97	0.05%	3.56%	0.00%	9.00%	0.00%
Public Storage	PSA	175.829	258.76	45,497.51	0.15%	4.64%	0.01%	3.77%	0.01%
Arista Networks Inc	ANET	311.1	219.71	68,351.78	0.23%			19.72%	0.05%
Sysco Corp	SYY	504.372	72.17	36,400.53	0.12%	2.77%	0.00%	13.00%	0.02%
Corteva Inc	CTVA	704.88	45.2	31,860.58	0.11%	1.42%	0.00%	16.17%	0.02%
Texas Instruments Inc	TXN	908.204	152.71	138,691.83	0.47%	3.41%	0.02%	10.00%	0.05%
Textron Inc	TXT	196.005	76.66	15,025.74	0.05%	0.10%	0.00%	11.73%	0.01%
Thermo Fisher Scientific Inc	TMO	386.372	495.76	191,547.78		0.28%		-5.00%	
TJX Cos Inc/The	TJX	1139.677	88.11	100,416.94	0.34%	1.51%	0.01%	6.38%	0.02%
Globe Life Inc	GL	94.119	123.13	11,588.87		0.73%			
Johnson Controls International plc	JCI	680.32	52.8	35,920.90	0.12%	2.80%	0.00%	13.36%	0.02%
Ulta Beauty Inc	ULTA	48.562	425.99	20,686.93	0.07%			6.41%	0.00%
Union Pacific Corp	UNP	609.597	225.27	137,323.92	0.47%	2.31%	0.01%	11.00%	0.05%
Keysight Technologies Inc	KEYS	174.6	135.89	23,726.39	0.08%			1.81%	0.00%
UnitedHealth Group Inc	UNH	924.925	551.09	509,716.92	1.74%	1.36%	0.02%	13.40%	0.23%
Blackstone Inc	BX	710.545	112.37	79,843.94	0.27%	2.85%	0.01%	7.63%	0.02%
Marathon Oil Corp	MRO	585.247	25.43	14,882.83	0.05%	1.73%	0.00%	8.00%	0.00%
Bio-Rad Laboratories Inc	BIO	24.059	304.92	7,336.07	0.02%			4.00%	0.00%
Ventas Inc	VTR	402.381	45.84	18,445.15	0.06%	3.93%	0.00%	8.02%	0.01%
VF Corp	VFC	388.883	16.73	6,506.01	0.02%	2.15%	0.00%	3.10%	0.00%
Vulcan Materials Co	VMC	132.873	213.56	28,376.36		0.81%		23.22%	
Weyerhaeuser Co	WY	730.001	31.35	22,885.53		2.42%			
Whirlpool Corp	WHR	54.853	108.9	5,973.49		6.43%		-2.33%	
Williams Cos Inc/The	WMB	1216.499	36.79	44,755.00	0.15%	4.87%	0.01%	3.50%	0.01%
Constellation Energy Corp	CEG	319.382	121.04	38,658.00		0.93%		26.33%	
WEC Energy Group Inc	WEC	315.435	83.62	26,376.67	0.09%	3.73%	0.00%	6.41%	0.01%
Adobe Inc	ADBE	455.3	611.01	278,192.85	0.95%			17.33%	0.16%
AES Corp/The	AES	669.629	17.21	11,524.32	0.04%	3.86%	0.00%	10.12%	0.00%
Expeditors International of Washington Inc	EXPD	145.389	120.34	17,496.11		1.15%		-16.00%	
Amgen Inc	AMGN	535.178	269.64	144,305.40	0.49%	3.16%	0.02%	4.88%	0.02%
Apple Inc	AAPL	15552.752	189.95	2,954,245.24	10.06%	0.51%	0.05%	13.00%	1.31%
Autodesk Inc	ADSK	213.764	218.43	46,692.47	0.16%			12.48%	0.02%
Cintas Corp	CTAS	101.854	553.25	56,350.73	0.19%	0.98%	0.00%	11.84%	0.02%
Comcast Corp	CMCSA	4015.635	41.89	168,214.95	0.57%	2.77%	0.02%	9.26%	0.05%
Molson Coors Beverage Co	TAP	200.955	61.54	12,366.77	0.04%	2.66%	0.00%	12.99%	0.01%
KLA Corp	KLAC	135.932	544.62	74,031.29	0.25%	1.06%	0.00%	9.93%	0.03%
Marriott International Inc/MD	MAR	293.691	202.7	59,531.17	0.20%	1.03%	0.00%	17.38%	0.04%
Fiserv Inc	FI	600.186	130.61	78,390.29	0.27%			14.08%	0.04%
McCormick & Co Inc/MD	MKC	251.291	64.83	16,291.20	0.06%	2.59%	0.00%	7.01%	0.00%
PACCAR Inc	PCAR	523.076	91.82	48,028.84	0.16%	1.18%	0.00%	12.00%	0.02%
Costco Wholesale Corp	COST	442.741	592.74	262,430.30	0.89%	0.69%	0.01%	13.06%	0.12%
Stryker Corp	SYK	379.895	296.33	112,574.29	0.38%	1.01%	0.00%	7.62%	0.03%
Tyson Foods Inc	TSN	285.231	46.84	13,360.22		4.18%		46.71%	
Lamb Weston Holdings Inc	LW	144.927	100.03	14,497.05	0.05%	1.12%	0.00%	13.32%	0.01%
Applied Materials Inc	AMAT	836.534	149.78	125,296.06	0.43%	0.85%	0.00%	5.50%	0.02%
American Airlines Group Inc	AAL	653.541	12.43	8,123.51				54.64%	
Cardinal Health Inc	CAH	246.468	107.08	26,391.79	0.09%	1.87%	0.00%	13.32%	0.01%
Cincinnati Financial Corp	CINF	156.908	102.79	16,128.57	0.05%	2.92%	0.00%	18.21%	0.01%
Paramount Global	PARA	610.704	14.37	8,775.82		1.39%		-20.36%	
DR Horton Inc	DHI	333.184	127.67	42,537.60	0.14%	0.94%	0.00%	1.70%	0.00%
Electronic Arts Inc	EA	268.966	138.01	37,120.00	0.13%	0.55%	0.00%	10.32%	0.01%
Fair Isaac Corp	FICO	24.714	1087.6	26,878.95				22.00%	
Fastenal Co	FAST	571.413	59.97	34,267.64		2.33%			
M&T Bank Corp	MTB	165.96	128.17	21,271.09	0.07%	4.06%	0.00%	11.59%	0.01%
Xcel Energy Inc	XEL	551.816	60.84	33,572.49	0.11%	3.42%	0.00%	6.12%	0.01%
Fifth Third Bancorp	FITB	681.017	28.95	19,715.44		4.84%		25.00%	
Gilead Sciences Inc	GILD	1246.042	76.6	95,446.82	0.33%	3.92%	0.01%	2.10%	0.01%

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Hasbro Inc	HAS	138.764	46.41	6,440.04		6.03%		-3.49%	
Huntington Bancshares Inc/OH	HBAN	1448.075	11.26	16,305.32		5.51%		-7.69%	
Welltower Inc	WELL	556.094	89.1	49,547.98	0.17%	2.74%	0.00%	10.96%	0.02%
Biogen Inc	BIIB	144.898	234.08	33,917.72	0.12%			0.87%	0.00%
Northern Trust Corp	NTRS	207.036	79.25	16,407.60	0.06%	3.79%	0.00%	5.93%	0.00%
Packaging Corp of America	PKG	89.624	168.01	15,057.73	0.05%	2.98%	0.00%	5.00%	0.00%
Paychex Inc	PAYX	361.232	121.97	44,059.47	0.15%	2.92%	0.00%	7.00%	0.01%
QUALCOMM Inc	QCOM	1113	129.05	143,632.65	0.49%	2.48%	0.01%	11.61%	0.06%
Ross Stores Inc	ROST	338.632	130.38	44,150.84	0.15%	1.03%	0.00%	10.00%	0.02%
IDEXX Laboratories Inc	IDXX	83.052	465.82	38,687.28	0.13%			17.98%	0.02%
Starbucks Corp	SBUX	1136.7	99.3	112,874.31	0.38%	2.30%	0.01%	17.41%	0.07%
KeyCorp	KEY	936.26	12.39	11,600.26	0.04%	6.62%	0.00%	7.08%	0.00%
Fox Corp	FOXA	247.227	29.54	7,303.09	0.02%	1.76%	0.00%	6.24%	0.00%
Fox Corp	FOX	235.581	27.66	6,516.17	0.02%	1.88%	0.00%	6.24%	0.00%
State Street Corp	STT	308.584	72.82	22,471.09	0.08%	3.79%	0.00%	6.92%	0.01%
Norwegian Cruise Line Holdings Ltd	NCLH	425.425	15.27	6,496.24					
US Bancorp	USB	1557.012	38.12	59,353.30	0.20%	5.04%	0.01%	7.50%	0.02%
A O Smith Corp	AOS	122.828	75.36	9,256.32		1.70%			
Gen Digital Inc	GEN	640.715	22.08	14,146.99	0.05%	2.26%	0.00%	12.98%	0.01%
T Rowe Price Group Inc	TROW	223.47	100.13	22,376.05		4.87%		-4.09%	
Waste Management Inc	WM	402.775	170.99	68,870.50	0.23%	1.64%	0.00%	10.05%	0.02%
Constellation Brands Inc	STZ	183.663	240.49	44,169.11	0.15%	1.48%	0.00%	9.75%	0.01%
DENTSPLY SIRONA Inc	XRAY	211.86	31.75	6,726.56	0.02%	1.76%	0.00%	7.93%	0.00%
Zions Bancorp NA	ZION	148.149	35.63	5,278.55		4.60%		-9.73%	
Alaska Air Group Inc	ALK	128.053	37.81	4,841.68	0.02%			3.56%	0.00%
Invesco Ltd	IVZ	449.554	14.27	6,415.14		5.61%		-0.68%	
Intuit Inc	INTU	279.936	571.46	159,972.23	0.54%	0.63%	0.00%	18.96%	0.10%
Morgan Stanley	MS	1641.312	79.34	130,221.69	0.44%	4.29%	0.02%	3.64%	0.02%
Microchip Technology Inc	MCHP	541.045	83.44	45,144.79		2.10%		-1.00%	
Chubb Ltd	CB	407.99	229.43	93,605.15	0.32%	1.50%	0.00%	15.50%	0.05%
Hologic Inc	HOLX	240.003	71.3	17,112.21				-8.76%	
Citizens Financial Group Inc	CFG	466.223	27.27	12,713.90		6.16%		-10.63%	
O'Reilly Automotive Inc	ORLY	59.162	982.38	58,119.57	0.20%			11.39%	0.02%
Allstate Corp/The	ALL	261.687	137.87	36,078.79		2.58%		50.02%	
Equity Residential	EQR	379.724	56.84	21,583.51	0.07%	4.66%	0.00%	4.75%	0.00%
BorgWarner Inc	BWA	235.055	33.69	7,919.00	0.03%	1.31%	0.00%	4.33%	0.00%
Keurig Dr Pepper Inc	KDP	1398.336	31.57	44,145.47	0.15%	2.72%	0.00%	6.85%	0.01%
Host Hotels & Resorts Inc	HST	705.4	17.47	12,323.34		4.12%			
Incyte Corp	INCY	224.109	54.34	12,178.08				36.36%	
Simon Property Group Inc	SPG	326.247	124.89	40,744.99	0.14%	6.09%	0.01%	1.71%	0.00%
Eastman Chemical Co	EMN	118.564	83.83	9,939.22	0.03%	3.77%	0.00%	4.75%	0.00%
AvalonBay Communities Inc	AVB	142.015	172.94	24,560.07	0.08%	3.82%	0.00%	6.27%	0.01%
Prudential Financial Inc	PRU	361	97.78	35,298.58	0.12%	5.11%	0.01%	10.47%	0.01%
United Parcel Service Inc	UPS	723.257	151.61	109,652.99	0.37%	4.27%	0.02%	1.64%	0.01%
Walgreens Boots Alliance Inc	WBA	863.915	19.94	17,226.47	0.06%	9.63%	0.01%	0.25%	0.00%
STERIS PLC	STE	98.8	200.94	19,852.87		1.04%			
McKesson Corp	MCK	133.062	470.56	62,613.65	0.21%	0.53%	0.00%	10.04%	0.02%
Lockheed Martin Corp	LMT	248.099	447.77	111,091.29	0.38%	2.81%	0.01%	7.04%	0.03%
Cencora Inc	COR	199.433	203.37	40,558.69	0.14%	1.00%	0.00%	9.04%	0.01%
Capital One Financial Corp	COF	380.847	111.66	42,525.38		2.15%		-6.30%	
Waters Corp	WAT	59.127	280.61	16,591.63	0.06%			4.44%	0.00%
Nordson Corp	NDSN	57.014	235.34	13,417.67		1.16%			
Dollar Tree Inc	DLTR	217.872	123.59	26,926.80	0.09%			7.77%	0.01%
Darden Restaurants Inc	DRI	120.315	156.47	18,825.69	0.06%	3.35%	0.00%	10.45%	0.01%
Evergy Inc	EVRG	229.583	51.04	11,717.92	0.04%	5.04%	0.00%	4.82%	0.00%
Match Group Inc	MTCH	271.812	32.38	8,801.27				43.48%	
Domino's Pizza Inc	DPZ	34.881	392.89	13,704.40	0.05%	1.23%	0.00%	13.97%	0.01%
NVR Inc	NVR	3.179	6155.39	19,567.98				-4.57%	
NetApp Inc	NTAP	206.031	91.39	18,829.17	0.06%	2.19%	0.00%	7.40%	0.00%
Old Dominion Freight Line Inc	ODFL	109.114	389.06	42,451.89	0.14%	0.41%	0.00%	5.83%	0.01%
DaVita Inc	DVA	91.3	101.46	9,263.30				21.67%	
Hartford Financial Services Group Inc/The	HIG	300.77	78.16	23,508.18	0.08%	2.41%	0.00%	7.00%	0.01%
Iron Mountain Inc	IRM	291.99	64.15	18,731.16	0.06%	4.05%	0.00%	4.00%	0.00%
Estee Lauder Cos Inc/The	EL	232.305	127.69	29,663.03	0.10%	2.07%	0.00%	13.86%	0.01%
Cadence Design Systems Inc	CDNS	272.062	273.27	74,346.38	0.25%			18.56%	0.05%
Tyler Technologies Inc	TYL	42.124	408.84	17,221.98					
Universal Health Services Inc	UHS	61.007	137.48	8,387.24	0.03%	0.58%	0.00%	9.41%	0.00%
Skyworks Solutions Inc	SWKS	159.955	96.93	15,504.44		2.81%		-7.11%	
Quest Diagnostics Inc	DGX	112.435	137.23	15,429.46		2.07%		-1.27%	
Rockwell Automation Inc	ROK	114.673	275.44	31,585.53	0.11%	1.82%	0.00%	12.16%	0.01%
Kraft Heinz Co/The	KHC	1226.539	35.11	43,063.78	0.15%	4.56%	0.01%	4.03%	0.01%
American Tower Corp	AMT	466.165	208.78	97,325.93	0.33%	3.10%	0.01%	10.93%	0.04%
Regeneron Pharmaceuticals Inc	REGN	107.129	823.81	88,253.94	0.30%			4.00%	0.01%
Amazon.com Inc	AMZN	10334.031	146.09	1,509,698.59				86.99%	
Jack Henry & Associates Inc	JKHY	72.828	158.69	11,557.08	0.04%	1.31%	0.00%	7.06%	0.00%
Ralph Lauren Corp	RL	39.752	129.38	5,143.11	0.02%	2.32%	0.00%	10.38%	0.00%
Boston Properties Inc	BXP	156.939	56.93	8,934.54	0.03%	6.89%	0.00%	2.82%	0.00%
Amphenol Corp	APH	598.31	90.99	54,440.23	0.19%	0.97%	0.00%	4.04%	0.01%
Howmet Aerospace Inc	HWM	411.744	52.6	21,657.73		0.38%		20.41%	
Pioneer Natural Resources Co	PXD	233.309	231.64	54,043.70		5.53%		-3.00%	
Valero Energy Corp	VLO	340.453	125.36	42,679.19		3.25%		35.66%	
Synopsys Inc	SNPS	152.053	543.23	82,599.75	0.28%			16.68%	0.05%
Etsy Inc	ETSY	119.746	75.81	9,077.94	0.03%			2.74%	0.00%
CH Robinson Worldwide Inc	CHRW	116.651	82.05	9,571.21	0.03%	2.97%	0.00%	5.00%	0.00%
Accenture PLC	ACN	664.787	333.14	221,467.14	0.75%	1.55%	0.01%	10.00%	0.08%
TransDigm Group Inc	TDG	55.314	962.87	53,260.19	0.18%			15.56%	0.03%
Yum! Brands Inc	YUM	280.308	125.55	35,192.67	0.12%	1.93%	0.00%	11.93%	0.01%
Prologis Inc	PLD	923.862	114.93	106,179.46	0.36%	3.03%	0.01%	8.00%	0.03%
FirstEnergy Corp	FE	573.815	36.94	21,196.73		4.44%		-0.33%	
VeriSign Inc	VRSN	102.1	212.2	21,665.62	0.07%			11.50%	0.01%
Quanta Services Inc	PWR	145.285	188.31	27,358.62	0.09%	0.17%	0.00%	8.00%	0.01%
Henry Schein Inc	HSIC	130.585	66.73	8,713.94	0.03%			3.44%	0.00%

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Ameren Corp	AEE	262.475	77.59	20,365.44	0.07%	3.25%	0.00%	7.11%	0.00%
ANSYS Inc	ANSS	86.873	293.36	25,485.06	0.09%			10.77%	0.01%
FactSet Research Systems Inc	FDS	37.988	453.46	17,226.04	0.06%	0.86%	0.00%	10.45%	0.01%
NVIDIA Corp	NVDA	2470	467.7	1,155,219.00		0.03%		50.82%	
Sealed Air Corp	SEE	144.436	33.38	4,821.27	0.02%	2.40%	0.00%	0.01%	0.00%
Cognizant Technology Solutions Corp	CTSH	501.413	70.38	35,289.45	0.12%	1.65%	0.00%	12.00%	0.01%
Intuitive Surgical Inc	ISRG	352.072	310.84	109,438.06	0.37%			11.57%	0.04%
Take-Two Interactive Software Inc	TTWO	170.068	158.2	26,904.76				58.00%	
Republic Services Inc	RSG	314.637	161.84	50,920.85	0.17%	1.32%	0.00%	9.97%	0.02%
eBay Inc	EBAY	519	41.01	21,284.19	0.07%	2.44%	0.00%	0.32%	0.00%
Goldman Sachs Group Inc/The	GS	326.112	341.54	111,380.29	0.38%	3.22%	0.01%	7.71%	0.03%
SBA Communications Corp	SBAC	107.887	246.96	26,643.77	0.09%	1.38%	0.00%	8.00%	0.01%
Sempra	SRE	629.328	72.87	45,859.13	0.16%	3.27%	0.01%	5.49%	0.01%
Moody's Corp	MCO	183	364.96	66,787.68	0.23%	0.84%	0.00%	14.08%	0.03%
ON Semiconductor Corp	ON	430.698	71.33	30,721.69	0.10%			3.72%	0.00%
Booking Holdings Inc	BKNG	34.89	3125.7	109,055.67	0.37%			15.00%	0.06%
F5 Inc	FFIV	59.707	171.19	10,221.24	0.03%			5.45%	0.00%
Akamai Technologies Inc	AKAM	150.832	115.53	17,425.62					
Charles River Laboratories International Inc	CRL	51.297	197.08	10,109.61	0.03%			9.00%	0.00%
MarketAxess Holdings Inc	MKTX	37.905	240.12	9,101.75		1.20%			
Devon Energy Corp	DVN	640.7	44.97	28,812.28		6.85%		51.35%	
Bio-Techne Corp	TECH	158.15	62.9	9,947.64	0.03%	0.51%	0.00%	4.50%	0.00%
Alphabet Inc	GOOGL	5918	132.53	784,312.54	2.67%			16.65%	0.44%
Teleflex Inc	TFX	46.993	225.69	10,605.85	0.04%	0.60%	0.00%	7.00%	0.00%
Netflix Inc	NFLX	437.68	473.97	207,447.19				30.96%	
Allegion plc	ALLE	87.788	106.09	9,313.43	0.03%	1.70%	0.00%	5.93%	0.00%
Agilent Technologies Inc	A	292.123	127.8	37,333.32	0.13%	0.74%	0.00%	8.00%	0.01%
Warner Bros Discovery Inc	WBD	2438.566	10.45	25,483.01				91.04%	
Elevance Health Inc	ELV	234.959	479.49	112,660.49	0.38%	1.23%	0.00%	10.85%	0.04%
Trimble Inc	TRMB	248.768	46.4	11,542.84					
CME Group Inc	CME	359.99	218.36	78,607.42	0.27%	2.02%	0.01%	11.10%	0.03%
Juniper Networks Inc	JNPR	318.868	28.45	9,071.79	0.03%	3.09%	0.00%	7.96%	0.00%
BlackRock Inc	BLK	148.762	751.23	111,754.48	0.38%	2.66%	0.01%	6.72%	0.03%
DTE Energy Co	DTE	206.109	104.11	21,458.01	0.07%	3.66%	0.00%	7.00%	0.01%
Nasdaq Inc	NDAQ	576.965	55.84	32,217.73	0.11%	1.58%	0.00%	2.68%	0.00%
Celanese Corp	CE	108.855	138.66	15,093.83	0.05%	2.02%	0.00%	2.27%	0.00%
Philip Morris International Inc	PM	1552.406	93.36	144,932.62	0.49%	5.57%	0.03%	9.19%	0.05%
Salesforce Inc	CRM	968	251.9	243,839.20				21.67%	
Ingersoll Rand Inc	IR	404.797	71.43	28,914.65	0.10%	0.11%	0.00%	14.00%	0.01%
Huntington Ingalls Industries Inc	HII	39.723	237.02	9,415.15		2.19%		40.00%	
Roper Technologies Inc	ROP	106.822	538.25	57,496.94		0.56%		-1.00%	
MetLife Inc	MET	740.19	63.63	47,098.29	0.16%	3.27%	0.01%	9.17%	0.01%
Tapestry Inc	TPR	229.186	31.67	7,258.32	0.02%	4.42%	0.00%	11.00%	0.00%
CSX Corp	CSX	1976.131	32.3	63,829.03	0.22%	1.36%	0.00%	6.39%	0.01%
Edwards Lifesciences Corp	EW	606.5	67.71	41,066.12	0.14%			9.23%	0.01%
Ameriprise Financial Inc	AMP	101.196	353.51	35,773.80	0.12%	1.53%	0.00%	15.82%	0.02%
Zebra Technologies Corp	ZBRA	51.36	236.98	12,171.29					
Zimmer Biomet Holdings Inc	ZBH	208.981	116.31	24,306.58	0.08%	0.83%	0.00%	7.12%	0.01%
CBRE Group Inc	CBRE	304.793	78.96	24,066.46					
Camden Property Trust	CPT	106.771	90.26	9,637.15	0.03%	4.43%	0.00%	6.17%	0.00%
Mastercard Inc	MA	930.438	413.83	385,043.16	1.31%	0.55%	0.01%	17.35%	0.23%
CarMax Inc	KMX	158.668	63.94	10,145.23	0.03%			16.34%	0.01%
Intercontinental Exchange Inc	ICE	572.364	113.84	65,157.92	0.22%	1.48%	0.00%	8.66%	0.02%
Fidelity National Information Services Inc	FIS	592.484	58.64	34,743.26	0.12%	3.55%	0.00%	5.51%	0.01%
Chipotle Mexican Grill Inc	CMG	27.445	2202.25	60,440.75				25.41%	
Wynn Resorts Ltd	WYNN	112.946	84.42	9,534.90		1.18%		153.24%	
Live Nation Entertainment Inc	LYV	230.325	84.22	19,397.97					
Assurant Inc	AIZ	52.591	168.02	8,836.34	0.03%	1.71%	0.00%	14.60%	0.00%
NRG Energy Inc	NRG	225.764	47.84	10,800.55		3.16%			
Regions Financial Corp	RF	930.065	16.68	15,513.48	0.05%	5.76%	0.00%	0.99%	0.00%
Monster Beverage Corp	MNST	1040.441	55.15	57,380.32				21.32%	
Mosaic Co/The	MOS	326.835	35.89	11,730.11	0.04%	2.23%	0.00%	7.00%	0.00%
Baker Hughes Co	BKR	1006.234	33.75	33,960.40	0.12%	2.37%	0.00%	16.00%	0.02%
Expedia Group Inc	EXPE	133.325	136.18	18,156.20	0.06%			17.50%	0.01%
CF Industries Holdings Inc	CF	191.057	75.15	14,357.93		2.13%		46.00%	
Leidos Holdings Inc	LDOS	137.506	107.32	14,757.14	0.05%	1.42%	0.00%	8.12%	0.00%
APA Corp	APA	306.719	36	11,041.88	0.04%	2.78%	0.00%	0.72%	0.00%
Alphabet Inc	GOOG	5725	133.92	766,692.00	2.61%			16.65%	0.43%
First Solar Inc	FSLR	106.844	157.78	16,857.85				43.22%	
TE Connectivity Ltd	TEL	310.779	131	40,712.05		1.80%			
Discover Financial Services	DFS	250.058	93	23,255.39		3.01%		56.16%	
Visa Inc	V	1580.68	256.68	405,728.94	1.38%	0.81%	0.01%	14.32%	0.20%
Mid-America Apartment Communities Inc	MAA	116.688	124.48	14,525.32	0.05%	4.50%	0.00%	1.77%	0.00%
Xylem Inc/NY	XYL	241.078	105.13	25,344.53		1.26%			
Marathon Petroleum Corp	MPC	379.697	149.19	56,647.00		2.21%			
Advanced Micro Devices Inc	AMD	1615.499	121.16	195,733.86				30.65%	
Tractor Supply Co	TSCO	108.114	203.01	21,948.22	0.07%	2.03%	0.00%	3.81%	0.00%
ResMed Inc	RMD	147.092	157.73	23,200.82		1.22%			
Mettler-Toledo International Inc	MTD	21.684	1091.93	23,677.41	0.08%			5.01%	0.00%
Jacobs Solutions Inc	J	126.024	127.18	16,027.73	0.05%	0.82%	0.00%	12.31%	0.01%
Copart Inc	CPRT	960.231	50.22	48,222.80					
VICI Properties Inc	VICI	1034.532	29.89	30,922.16	0.11%	5.55%	0.01%	7.09%	0.01%
Fortinet Inc	FTNT	767.91	52.56	40,361.35	0.14%			15.03%	0.02%
Albemarle Corp	ALB	117.353	121.27	14,231.40	0.05%	1.32%	0.00%	18.79%	0.01%
Moderna Inc	MRNA	381.284	77.7	29,625.77				-29.33%	
Essex Property Trust Inc	ESS	64.183	213.46	13,700.50	0.05%	4.33%	0.00%	5.71%	0.00%
CoStar Group Inc	CSGP	408.363	83.04	33,910.46	0.12%			20.00%	0.02%
Realty Income Corp	O	723.924	53.96	39,062.94	0.13%	5.69%	0.01%	0.68%	0.00%
Westrock Co	WRK	256.469	41.17	10,558.83	0.04%	2.94%	0.00%	4.20%	0.00%
Westinghouse Air Brake Technologies Corp	WAB	179.159	116.56	20,882.77	0.07%	0.58%	0.00%	12.86%	0.01%
Pool Corp	POOL	38.679	347.32	13,433.99		1.27%		-5.49%	
Western Digital Corp	WDC	324.243	48.31	15,664.18				-11.96%	

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PepsiCo Inc	PEP	1374.864	168.29	231,375.86	0.79%	3.01%	0.02%	8.70%	0.07%
Diamondback Energy Inc	FANG	178.985	154.41	27,637.07		8.73%		21.94%	
Palo Alto Networks Inc	PANW	315.3	295.09	93,041.88				30.00%	
ServiceNow Inc	NOW	205	685.74	140,576.70					
Church & Dwight Co Inc	CHD	246.382	96.63	23,807.89	0.08%	1.13%	0.00%	5.95%	0.00%
Federal Realty Investment Trust	FRT	81.618	95.59	7,801.86	0.03%	4.56%	0.00%	5.77%	0.00%
MGM Resorts International	MGM	341.583	39.44	13,472.03					
American Electric Power Co Inc	AEP	515.176	79.55	40,982.25	0.14%	4.42%	0.01%	4.83%	0.01%
SolarEdge Technologies Inc	SEDG	56.811	79.38	4,509.66				27.00%	
Invitation Homes Inc	INVH	611.958	33.36	20,414.92	0.07%	3.12%	0.00%	3.15%	0.00%
PTC Inc	PTC	119.245	157.36	18,764.39	0.06%			19.31%	0.01%
JB Hunt Transport Services Inc	JBHT	103.143	185.27	19,109.30		0.91%		27.00%	
Lam Research Corp	LRCX	131.792	715.92	94,352.53	0.32%	1.12%	0.00%	5.44%	0.02%
Mohawk Industries Inc	MHK	63.682	88.31	5,623.76				-3.08%	
Pentair PLC	PNR	165.299	64.54	10,668.40	0.04%	1.36%	0.00%	6.22%	0.00%
GE HealthCare Technologies Inc	GEHC	455.243	68.46	31,165.94	0.11%	0.18%	0.00%	12.70%	0.01%
Vertex Pharmaceuticals Inc	VRTX	257.683	354.81	91,428.51	0.31%			13.38%	0.04%
Amcor PLC	AMCR	1445.343	9.48	13,701.85	0.05%	5.27%	0.00%	1.33%	0.00%
Meta Platforms Inc	META	2219.607	327.15	726,144.43				24.05%	
T-Mobile US Inc	TMUS	1156.475	150.45	173,991.66		1.73%		38.46%	
United Rentals Inc	URI	67.781	476.02	32,265.11	0.11%	1.24%	0.00%	17.87%	0.02%
Honeywell International Inc	HON	659.251	195.92	129,160.46	0.44%	2.20%	0.01%	7.69%	0.03%
Alexandria Real Estate Equities Inc	ARE	173.775	109.4	19,010.99	0.06%	4.53%	0.00%	5.28%	0.00%
Delta Air Lines Inc	DAL	643.463	36.93	23,763.09		1.08%		30.85%	
Seagate Technology Holdings PLC	STX	209.184	79.1	16,546.45	0.06%	3.54%	0.00%	6.11%	0.00%
United Airlines Holdings Inc	UAL	328.017	39.4	12,923.87				46.54%	
News Corp	NWS	191.385	23.04	4,409.51		0.87%			
Centene Corp	CNC	534.201	73.68	39,359.93	0.13%			8.43%	0.01%
Martin Marietta Materials Inc	MLM	61.807	464.59	28,714.91		0.64%		21.60%	
Teradyne Inc	TER	152.879	92.23	14,100.03	0.05%	0.48%	0.00%	7.82%	0.00%
PayPal Holdings Inc	PYPL	1078.14	57.61	62,111.65	0.21%			6.26%	0.01%
Tesla Inc	TSLA	3178.921	240.08	763,195.35	2.60%			11.00%	0.29%
Arch Capital Group Ltd	ACGL	373.172	83.69	31,230.76	0.11%			10.00%	0.01%
Dow Inc	DOW	701.397	51.75	36,297.29		5.41%		-4.72%	
Everest Group Ltd	EG	43.39	410.55	17,813.76		1.71%		37.66%	
Teledyne Technologies Inc	TDY	47.185	402.96	19,013.67	0.06%			8.03%	0.01%
News Corp	NWSA	380.67	22.04	8,389.97		0.91%			
Exelon Corp	EXC	994.299	38.51	38,290.45	0.13%	3.74%	0.00%	4.00%	0.01%
Global Payments Inc	GPN	260.389	116.44	30,319.70	0.10%	0.86%	0.00%	13.33%	0.01%
Crown Castle Inc	CCI	433.689	117.28	50,863.05	0.17%	5.34%	0.01%	7.00%	0.01%
Aptiv PLC	APTV	282.862	82.84	23,432.29	0.08%			11.44%	0.01%
Align Technology Inc	ALGN	76.589	213.8	16,374.73					
Illumina Inc	ILMN	158.8	101.95	16,189.66				-51.00%	
Kenvue Inc	KVUE	1914.995	20.44	39,142.50		3.91%			
Targa Resources Corp	TRGP	222.976	90.45	20,168.18	0.07%	2.21%	0.00%	15.00%	0.01%
Bunge Global SA	BG	161.429	109.87	17,736.20		2.41%		-5.00%	
LKQ Corp	LKQ	267.598	44.53	11,916.14		2.69%			
Zoetis Inc	ZTS	459.114	176.67	81,111.67	0.28%	0.85%	0.00%	10.91%	0.03%
Digital Realty Trust Inc	DLR	302.846	138.78	42,028.97	0.14%	3.52%	0.01%	6.80%	0.01%
Equinix Inc	EQIX	93.883	815.01	76,515.58	0.26%	2.09%	0.01%	16.67%	0.04%
Las Vegas Sands Corp	LVS	764.491	46.12	35,258.32		1.73%			
Molina Healthcare Inc	MOH	58.3	365.56	21,312.15	0.07%			11.24%	0.01%

Notes:

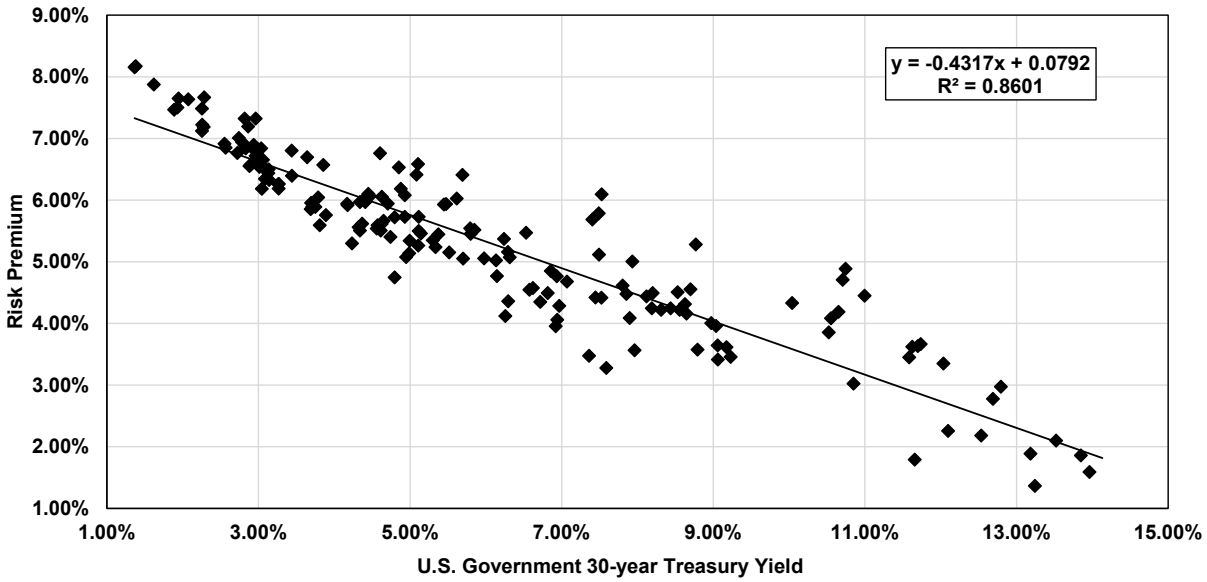
[1] Equals sum of Col. [9]
[2] Equals sum of Col. [11]
[3] Equals ([1] x (1 + (0.5 x [2]))) + [2]
[4] Bloomberg Professional as of November 30, 2023
[5] Bloomberg Professional as of November 30, 2023
[6] Equals [4] x [5]
[7] Equals weight in S&P 500 based on market capitalization [6] if Growth Rate >0% and ≤20%
[8] Source: Bloomberg Professional, as of November 30, 2023
[9] Equals [7] x [8]
[10] Value Line, as of November 30, 2023
[11] Equals [7] x [10]

BOND YIELD PLUS RISK PREMIUM

Quarter	[1] Authorized Natual Gas ROE	[2] U.S. Govt. 30-year Treasury	[3] Risk Premium
1980.1	13.45%	11.66%	1.79%
1980.2	14.38%	10.52%	3.85%
1980.3	13.87%	10.85%	3.02%
1980.4	14.35%	12.10%	2.25%
1981.1	14.71%	12.53%	2.18%
1981.2	14.61%	13.24%	1.36%
1981.3	14.86%	14.13%	0.72%
1981.4	15.70%	13.85%	1.86%
1982.1	15.55%	13.96%	1.59%
1982.2	15.62%	13.52%	2.10%
1982.3	15.77%	12.79%	2.97%
1982.4	15.63%	10.75%	4.89%
1983.1	15.41%	10.71%	4.71%
1983.2	14.84%	10.65%	4.19%
1983.3	15.24%	11.62%	3.62%
1983.4	15.40%	11.74%	3.66%
1984.1	15.39%	12.04%	3.35%
1984.2	15.07%	13.18%	1.89%
1984.3	15.46%	12.69%	2.77%
1984.4	15.33%	11.70%	3.63%
1985.1	15.03%	11.58%	3.45%
1985.2	15.44%	11.00%	4.45%
1985.3	14.64%	10.55%	4.08%
1985.4	14.37%	10.04%	4.33%
1986.1	14.05%	8.77%	5.28%
1986.2	13.28%	7.49%	5.79%
1986.3	13.09%	7.40%	5.69%
1986.4	13.62%	7.53%	6.09%
1987.1	12.61%	7.49%	5.11%
1987.2	13.04%	8.53%	4.51%
1987.3	12.70%	9.06%	3.64%
1987.4	12.69%	9.23%	3.46%
1988.1	12.94%	8.63%	4.31%
1988.2	12.48%	9.06%	3.41%
1988.3	12.79%	9.18%	3.61%
1988.4	12.98%	8.97%	4.00%
1989.1	12.99%	9.04%	3.96%
1989.2	13.25%	8.70%	4.55%
1989.3	12.56%	8.12%	4.44%
1989.4	12.94%	7.93%	5.00%
1990.1	12.68%	8.44%	4.24%
1990.2	12.81%	8.65%	4.16%
1990.3	12.36%	8.79%	3.57%
1990.4	12.78%	8.56%	4.22%
1991.1	12.69%	8.20%	4.49%
1991.2	12.53%	8.31%	4.22%
1991.3	12.43%	8.19%	4.24%
1991.4	12.33%	7.85%	4.48%
1992.1	12.42%	7.81%	4.61%
1992.2	11.98%	7.90%	4.09%
1992.3	11.87%	7.45%	4.42%
1992.4	11.94%	7.52%	4.42%
1993.1	11.75%	7.07%	4.68%
1993.2	11.71%	6.86%	4.85%
1993.3	11.39%	6.32%	5.07%
1993.4	11.16%	6.14%	5.02%
1994.1	11.12%	6.58%	4.54%
1994.2	10.84%	7.36%	3.47%
1994.3	10.87%	7.59%	3.28%
1994.4	11.53%	7.96%	3.56%
1995.2	11.00%	6.94%	4.06%

1995.3	11.07%	6.72%	4.35%
1995.4	11.61%	6.24%	5.37%
1996.1	11.45%	6.29%	5.16%
1996.2	10.88%	6.92%	3.95%
1996.3	11.25%	6.97%	4.28%
1996.4	11.19%	6.62%	4.57%
1997.1	11.31%	6.82%	4.49%
1997.2	11.70%	6.94%	4.76%
1997.3	12.00%	6.53%	5.47%
1997.4	10.92%	6.15%	4.77%
1998.2	11.37%	5.85%	5.52%
1998.3	11.41%	5.48%	5.93%
1998.4	11.69%	5.11%	6.58%
1999.1	10.82%	5.37%	5.44%
1999.2	11.25%	5.80%	5.45%
1999.4	10.38%	6.26%	4.12%
2000.1	10.66%	6.30%	4.36%
2000.2	11.03%	5.98%	5.05%
2000.3	11.33%	5.79%	5.54%
2000.4	12.10%	5.69%	6.41%
2001.1	11.38%	5.45%	5.93%
2001.2	10.75%	5.70%	5.05%
2001.4	10.65%	5.30%	5.35%
2002.1	10.67%	5.52%	5.15%
2002.2	11.64%	5.62%	6.03%
2002.3	11.50%	5.09%	6.41%
2002.4	11.01%	4.93%	6.08%
2003.1	11.38%	4.85%	6.53%
2003.2	11.36%	4.60%	6.76%
2003.3	10.61%	5.11%	5.50%
2003.4	10.84%	5.11%	5.73%
2004.1	11.06%	4.88%	6.18%
2004.2	10.57%	5.34%	5.24%
2004.3	10.37%	5.11%	5.26%
2004.4	10.66%	4.93%	5.73%
2005.1	10.65%	4.71%	5.94%
2005.2	10.54%	4.47%	6.07%
2005.3	10.47%	4.42%	6.05%
2005.4	10.32%	4.65%	5.66%
2006.1	10.68%	4.63%	6.05%
2006.2	10.60%	5.14%	5.46%
2006.3	10.34%	5.00%	5.34%
2006.4	10.14%	4.74%	5.40%
2007.1	10.52%	4.80%	5.72%
2007.2	10.13%	4.99%	5.14%
2007.3	10.03%	4.95%	5.08%
2007.4	10.12%	4.61%	5.50%
2008.1	10.38%	4.41%	5.97%
2008.2	10.17%	4.57%	5.59%
2008.3	10.55%	4.45%	6.10%
2008.4	10.34%	3.64%	6.69%
2009.1	10.24%	3.44%	6.80%
2009.2	10.11%	4.17%	5.94%
2009.3	9.88%	4.32%	5.56%
2009.4	10.31%	4.34%	5.97%
2010.1	10.24%	4.62%	5.61%
2010.2	9.99%	4.37%	5.62%
2010.3	10.43%	3.86%	6.57%
2010.4	10.09%	4.17%	5.92%
2011.1	10.10%	4.56%	5.54%
2011.2	9.85%	4.34%	5.51%
2011.3	9.65%	3.70%	5.95%
2011.4	9.88%	3.04%	6.84%
2012.1	9.63%	3.14%	6.50%
2012.2	9.83%	2.94%	6.89%
2012.3	9.75%	2.74%	7.01%

2012.4	10.06%	2.86%	7.19%
2013.1	9.57%	3.13%	6.44%
2013.2	9.47%	3.14%	6.33%
2013.3	9.60%	3.71%	5.89%
2013.4	9.83%	3.79%	6.04%
2014.1	9.54%	3.69%	5.85%
2014.2	9.84%	3.44%	6.39%
2014.3	9.45%	3.27%	6.18%
2014.4	10.28%	2.96%	7.32%
2015.1	9.47%	2.55%	6.91%
2015.2	9.43%	2.88%	6.55%
2015.3	9.75%	2.96%	6.79%
2015.4	9.68%	2.96%	6.71%
2016.1	9.48%	2.72%	6.76%
2016.2	9.42%	2.57%	6.85%
2016.3	9.47%	2.28%	7.19%
2016.4	9.67%	2.83%	6.84%
2017.1	9.60%	3.05%	6.55%
2017.2	9.47%	2.90%	6.57%
2017.3	10.14%	2.82%	7.32%
2017.4	9.70%	2.82%	6.88%
2018.1	9.68%	3.02%	6.66%
2018.2	9.43%	3.09%	6.34%
2018.3	9.71%	3.06%	6.65%
2018.4	9.53%	3.27%	6.26%
2019.1	9.55%	3.01%	6.54%
2019.2	9.73%	2.78%	6.94%
2019.3	9.95%	2.29%	7.67%
2019.4	9.74%	2.26%	7.48%
2020.1	9.35%	1.89%	7.46%
2020.2	9.55%	1.38%	8.17%
2020.3	9.52%	1.37%	8.15%
2020.4	9.50%	1.62%	7.87%
2021.1	9.71%	2.07%	7.63%
2021.2	9.48%	2.26%	7.22%
2021.3	9.43%	1.93%	7.50%
2021.4	9.59%	1.95%	7.65%
2022.1	9.38%	2.25%	7.12%
2022.2	9.23%	3.05%	6.18%
2022.3	9.52%	3.26%	6.26%
2022.4	9.65%	3.89%	5.75%
2023.1	9.64%	3.75%	5.89%
2023.2	9.40%	3.81%	5.59%
2023.3	9.53%	4.23%	5.30%
2023.4	9.54%	4.80%	4.75%
AVERAGE	11.37%	6.08%	5.29%
MEDIAN	10.83%	5.22%	5.50%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.9274231
R Square	0.8601137
Adjusted R Square	0.8592908
Standard Error	0.0054189
Observations	172

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.03069	0.03069	1,045.27263	0.00000
Residual	170	0.00499	0.00003		
Total	171	0.03569			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.0792	0.00	86.91	0.0000	0.0774	0.0810	0.0774	0.0810
U.S. Govt. 30-year Treasury	(0.4317)	0.01	(32.33)	0.0000	(0.4580)	(0.4053)	(0.4580)	(0.4053)

	[7] U.S. Govt. 30-year Treasury	[8] Risk Premium	[9] ROE
Current 30-day average of 30-year U.S. Treasury bond yield [4]	4.77%	5.86%	10.63%
Blue Chip Near-Term Projected Forecast (Q1 2024 - Q1 2025) [5]	4.48%	5.98%	10.46%
Blue Chip Long-Term Projected Forecast (2025-2029) [6]	4.10%	6.15%	10.25%
AVERAGE			10.45%

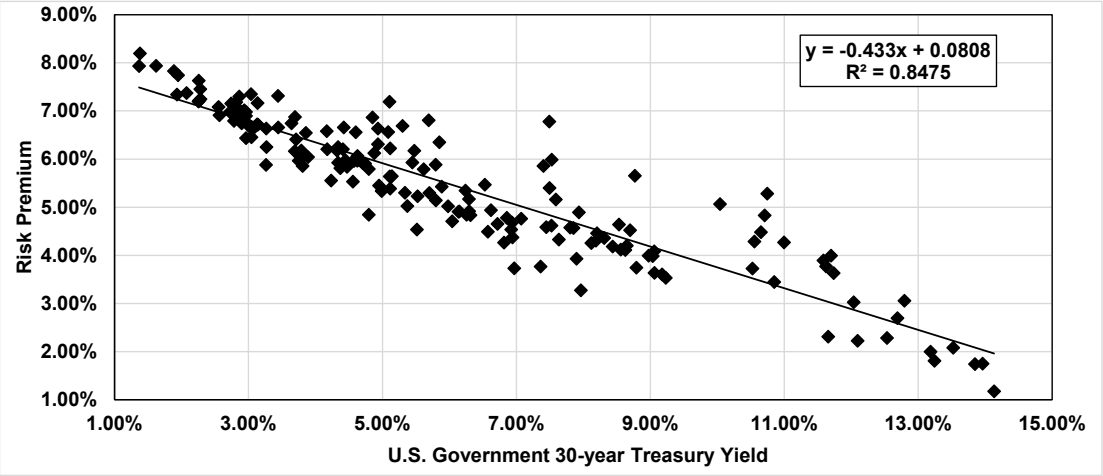
Notes:
[1] Regulatory Research Associates, rate cases through November 30, 2023
[2] S&P Capital IQ Pro, quarterly bond yields are the average of each trading day in the quarter
[3] Equals Column [1] − Column [2]
[4] S&P Capital IQ Pro, 30-day average as of November 30, 2023
[5] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[6] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[7] See notes [4], [5] & [6]
[8] Equals 0.079178 + (-0.431684 x Column [7])
[9] Equals Column [7] + Column [8]

BOND YIELD PLUS RISK PREMIUM

	[1]	[2]	[3]
Quarter	Average Authorized VI Electric ROE	U.S. Govt. 30-year Treasury	Risk Premium
1980.1	13.97%	11.66%	2.31%
1980.2	14.25%	10.52%	3.73%
1980.3	14.30%	10.85%	3.45%
1980.4	14.32%	12.10%	2.23%
1981.1	14.82%	12.53%	2.28%
1981.2	15.05%	13.24%	1.81%
1981.3	15.31%	14.13%	1.17%
1981.4	15.59%	13.85%	1.74%
1982.1	15.71%	13.96%	1.75%
1982.2	15.60%	13.52%	2.08%
1982.3	15.85%	12.79%	3.06%
1982.4	16.03%	10.75%	5.28%
1983.1	15.54%	10.71%	4.83%
1983.2	15.13%	10.65%	4.48%
1983.3	15.39%	11.62%	3.77%
1983.4	15.37%	11.74%	3.63%
1984.1	15.06%	12.04%	3.02%
1984.2	15.18%	13.18%	2.00%
1984.3	15.38%	12.69%	2.69%
1984.4	15.69%	11.70%	3.99%
1985.1	15.48%	11.58%	3.90%
1985.2	15.27%	11.00%	4.27%
1985.3	14.84%	10.55%	4.29%
1985.4	15.11%	10.04%	5.07%
1986.1	14.42%	8.77%	5.65%
1986.2	14.27%	7.49%	6.78%
1986.3	13.26%	7.40%	5.86%
1986.4	13.52%	7.53%	5.99%
1987.1	12.90%	7.49%	5.40%
1987.2	13.17%	8.53%	4.64%
1987.3	13.14%	9.06%	4.08%
1987.4	12.76%	9.23%	3.53%
1988.1	12.74%	8.63%	4.11%
1988.2	12.70%	9.06%	3.63%
1988.3	12.78%	9.18%	3.60%
1988.4	12.97%	8.97%	4.00%
1989.1	13.02%	9.04%	3.99%
1989.2	13.22%	8.70%	4.52%
1989.3	12.38%	8.12%	4.26%
1989.4	12.83%	7.93%	4.90%
1990.1	12.62%	8.44%	4.19%
1990.2	12.85%	8.65%	4.20%
1990.3	12.54%	8.79%	3.75%
1990.4	12.68%	8.56%	4.12%
1991.1	12.66%	8.20%	4.46%
1991.2	12.67%	8.31%	4.36%
1991.3	12.49%	8.19%	4.30%
1991.4	12.42%	7.85%	4.57%
1992.1	12.38%	7.81%	4.58%
1992.2	11.83%	7.90%	3.93%
1992.3	12.03%	7.45%	4.59%
1992.4	12.14%	7.52%	4.62%
1993.1	11.84%	7.07%	4.76%
1993.2	11.64%	6.86%	4.78%
1993.3	11.15%	6.32%	4.84%
1993.4	11.04%	6.14%	4.91%
1994.1	11.07%	6.58%	4.49%
1994.2	11.13%	7.36%	3.77%
1994.3	12.75%	7.59%	5.16%
1994.4	11.24%	7.96%	3.28%
1995.1	11.96%	7.63%	4.33%
1995.2	11.32%	6.94%	4.37%

1995.3	11.37%	6.72%	4.65%
1995.4	11.58%	6.24%	5.35%
1996.1	11.46%	6.29%	5.17%
1996.2	11.46%	6.92%	4.54%
1996.3	10.70%	6.97%	3.73%
1996.4	11.56%	6.62%	4.94%
1997.1	11.08%	6.82%	4.26%
1997.2	11.62%	6.94%	4.68%
1997.3	12.00%	6.53%	5.47%
1997.4	11.06%	6.15%	4.91%
1998.1	11.31%	5.88%	5.43%
1998.2	12.20%	5.85%	6.35%
1998.3	11.65%	5.48%	6.17%
1998.4	12.30%	5.11%	7.19%
1999.1	10.40%	5.37%	5.03%
1999.2	10.94%	5.80%	5.14%
1999.3	10.75%	6.04%	4.71%
1999.4	11.10%	6.26%	4.84%
2000.1	11.21%	6.30%	4.92%
2000.2	11.00%	5.98%	5.02%
2000.3	11.68%	5.79%	5.89%
2000.4	12.50%	5.69%	6.81%
2001.1	11.38%	5.45%	5.93%
2001.2	11.00%	5.70%	5.30%
2001.3	10.76%	5.53%	5.23%
2001.4	11.99%	5.30%	6.69%
2002.1	10.05%	5.52%	4.53%
2002.2	11.41%	5.62%	5.79%
2002.3	11.65%	5.09%	6.56%
2002.4	11.57%	4.93%	6.63%
2003.1	11.72%	4.85%	6.87%
2003.2	11.16%	4.60%	6.56%
2003.3	10.50%	5.11%	5.39%
2003.4	11.34%	5.11%	6.23%
2004.1	11.00%	4.88%	6.12%
2004.2	10.64%	5.34%	5.30%
2004.3	10.75%	5.11%	5.64%
2004.4	11.24%	4.93%	6.31%
2005.1	10.63%	4.71%	5.92%
2005.2	10.31%	4.47%	5.84%
2005.3	11.08%	4.42%	6.66%
2005.4	10.63%	4.65%	5.98%
2006.1	10.70%	4.63%	6.07%
2006.2	10.79%	5.14%	5.64%
2006.3	10.35%	5.00%	5.35%
2006.4	10.65%	4.74%	5.91%
2007.1	10.59%	4.80%	5.79%
2007.2	10.33%	4.99%	5.34%
2007.3	10.40%	4.95%	5.45%
2007.4	10.65%	4.61%	6.04%
2008.1	10.62%	4.41%	6.21%
2008.2	10.54%	4.57%	5.96%
2008.3	10.43%	4.45%	5.98%
2008.4	10.39%	3.64%	6.74%
2009.1	10.75%	3.44%	7.31%
2009.2	10.75%	4.17%	6.58%
2009.3	10.50%	4.32%	6.18%
2009.4	10.59%	4.34%	6.25%
2010.1	10.59%	4.62%	5.97%
2010.2	10.18%	4.37%	5.81%
2010.3	10.40%	3.86%	6.55%
2010.4	10.38%	4.17%	6.20%
2011.1	10.09%	4.56%	5.53%
2011.2	10.26%	4.34%	5.92%
2011.3	10.57%	3.70%	6.88%
2011.4	10.39%	3.04%	7.35%
2012.1	10.30%	3.14%	7.17%

2012.2	9.95%	2.94%	7.01%
2012.3	9.90%	2.74%	7.16%
2012.4	10.16%	2.86%	7.30%
2013.1	9.85%	3.13%	6.72%
2013.2	9.86%	3.14%	6.72%
2013.3	10.12%	3.71%	6.41%
2013.4	9.97%	3.79%	6.18%
2014.1	9.86%	3.69%	6.16%
2014.2	10.10%	3.44%	6.66%
2014.3	9.90%	3.27%	6.63%
2014.4	9.94%	2.96%	6.98%
2015.1	9.64%	2.55%	7.08%
2015.2	9.83%	2.88%	6.94%
2015.3	9.40%	2.96%	6.44%
2015.4	9.86%	2.96%	6.90%
2016.1	9.70%	2.72%	6.98%
2016.2	9.48%	2.57%	6.91%
2016.3	9.74%	2.28%	7.46%
2016.4	9.83%	2.83%	7.00%
2017.1	9.72%	3.05%	6.67%
2017.2	9.64%	2.90%	6.75%
2017.3	10.00%	2.82%	7.18%
2017.4	9.91%	2.82%	7.09%
2018.1	9.69%	3.02%	6.66%
2018.2	9.75%	3.09%	6.66%
2018.3	9.69%	3.06%	6.63%
2018.4	9.52%	3.27%	6.25%
2019.1	9.72%	3.01%	6.70%
2019.2	9.58%	2.78%	6.79%
2019.3	9.53%	2.29%	7.25%
2019.4	9.89%	2.26%	7.63%
2020.1	9.72%	1.89%	7.83%
2020.2	9.58%	1.38%	8.19%
2020.3	9.30%	1.37%	7.93%
2020.4	9.56%	1.62%	7.94%
2021.1	9.45%	2.07%	7.38%
2021.2	9.47%	2.26%	7.21%
2021.3	9.27%	1.93%	7.34%
2021.4	9.69%	1.95%	7.74%
2022.1	9.45%	2.25%	7.20%
2022.2	9.50%	3.05%	6.45%
2022.3	9.14%	3.26%	5.88%
2022.4	9.94%	3.89%	6.04%
2023.1	9.72%	3.75%	5.97%
2023.2	9.67%	3.81%	5.86%
2023.3	9.79%	4.23%	5.55%
2023.4	9.64%	4.80%	4.85%
AVERAGE	11.53%	6.09%	5.44%
MEDIAN	11.05%	5.35%	5.65%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.9205958
R Square	0.8474967
Adjusted R Square	0.8466202
Standard Error	0.0056565
Observations	176

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.03094	0.03094	966.95886	0.00000
Residual	174	0.00557	0.00003		
Total	175	0.03651			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.0808	0.00	85.17	0.0000	0.0789	0.0827	0.0789	0.0827
U.S. Govt. 30-year Treasury	(0.4330)	0.01	(31.10)	0.0000	(0.4605)	(0.4056)	(0.4605)	(0.4056)

	[7] U.S. Govt. 30-year Treasury	[8] Risk Premium	[9] ROE
Current 30-day average of 30-year U.S. Treasury bond yield [4]	4.77%	6.01%	10.79%
Blue Chip Near-Term Projected Forecast (Q1 2024 - Q1 2025) [5]	4.48%	6.14%	10.62%
Blue Chip Long-Term Projected Forecast (2025-2029) [6]	4.10%	6.30%	10.40%
AVERAGE			10.60%

Notes:
[1] Regulatory Research Associates, rate cases through November 30, 2023
[2] S&P Capital IQ Pro, quarterly bond yields are the average of each trading day in the quarter
[3] Equals Column [1] − Column [2]
[4] S&P Capital IQ Pro, 30-day average as of November 30, 2023
[5] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 2
[6] Blue Chip Financial Forecasts, Vol. 42, No. 12, December 1, 2023, at 14
[7] See notes [4], [5] & [6]
[8] Equals 0.080798 + (-0.433037 x Column [7])
[9] Equals Column [7] + Column [8]

REGULATORY RISK ASSESSMENT

Company	Ticker	State	Utility Type	Infrastructure Cost Recovery Mechanism	Future Test Year	Revenue Stabilization or Decoupling	Citations
Atmos Energy Corporation							
	ATO	Colorado	Gas	Yes	Historical	No	Infrastructure Cost Recovery: 2022 10-K, p. 9
	ATO	Kansas	Gas	Yes	Historical	Partial	Revenue Stabilization or Decoupling: 2022 10-K, p.9, S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated 7/18/22, Company Tariffs (CO and VA).
	ATO	Kentucky	Gas	Yes	Fully Forecast	Partial	
	ATO	Louisiana	Gas	No	Historical	FRP	
	ATO	Mississippi	Gas	Yes	Historical	FRP	Test Year: S&P Cap IQ Pro, Rate Case History and Commission Profiles; Company Tariffs (LA, MS, TN); 2022 10-K, p. 10
	ATO	Tennessee	Gas	No	Historical	FRP	
	ATO	Texas	Gas	Yes	Historical	FRP	
	ATO	Virginia	Gas	Yes	Historical	Partial	
NiSource Inc.							
	NI	Indiana	Electric	Yes	Fully Forecast	Partial	Infrastructure Cost Recovery and Revenue Stabilization or Decoupling: S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated 7/18/22
	NI	Indiana	Gas	Yes	Fully Forecast	No	Test Year: S&P Cap IQ Pro, Rate Case History
	NI	Kentucky	Gas	Yes	Fully Forecast	Partial	
	NI	Maryland	Gas	Yes	Partially Forecast	Partial	
	NI	Ohio	Gas	Yes	Partially Forecast	SFV	
	NI	Pennsylvania	Gas	Yes	Fully Forecast	Partial	
	NI	Virginia	Gas	Yes	Historical	Partial	
Northwest Natural Gas Company							Infrastructure Cost Recovery and Revenue Stabilization or Decoupling: S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated 7/18/22
	NWN	Oregon	Gas	Yes	Fully Forecast	Partial	Test Year: S&P Cap IQ Pro, Rate Case History
	NWN	Washington	Gas	No	Historical	No	
ONE Gas, Inc.							Infrastructure Cost Recovery and Revenue Stabilization or Decoupling: S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated 7/18/22; 2022 10-K, p. 7.
	OGS	Kansas	Gas	Yes	Historical	Partial	
	OGS	Oklahoma	Gas	No	Historical	FRP	Test Year: S&P Cap IQ Pro, Rate Case History
	OGS	Texas	Gas	Yes	Historical	FRP	
Spire, Inc.							Infrastructure Cost Recovery and Revenue Stabilization or Decoupling: S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated 7/18/22, Company Tariffs (AL and MS)
	SR	Alabama (AL)	Gas	No	Fully Forecast	FRP	
	SR	Alabama (Gulf)	Gas	No	Fully Forecast	FRP	
	SR	Mississippi	Gas	No	Historical	FRP	Test Year: S&P Cap IQ Pro, Rate Case History; 2022 10-K, pgs. 117-121
	SR	Missouri	Gas	Yes	Partially Forecast	Partial	

Proxy Group Totals				Yes	17	Historical	13	Full	0
				No	7	Fully Forecast	8	Partial	11
						Partially Forecast	3	FRP	9
								SFV	1
								No	3
				CCRM	70.8%	FTY	45.8%		87.5%

PSCo Gas	Colorado	Gas	No	Current Partial/ Proposed Full	Yes	Data provided by the Company

FLOTATION COSTS

Flotation Costs from Inception to Date

Date	Issuing Company	Shares Issued	Market Price	Offering Price	Underwriting Discount	Offering Expense	Net Proceeds	Total Flotation Costs	Gross Equity Issue before Costs	Net Proceeds	Flotation Cost Percentage
11/16/1949	Northern States Power	1,584,238	$10.750	$10.250	$0.124	$0.137	$9.989	$1,205,605	$17,030,559	$15,824,953	7.079%
6/4/1952	Northern States Power	1,108,966	$10.500	$10.500	$0.098	$0.162	$10.240	$288,331	$11,644,143	$11,355,812	2.476%
4/14/1954	Northern States Power	1,219,856	$15.250	$14.000	$0.060	$0.124	$13.816	$1,749,274	$18,602,804	$16,853,530	9.403%
2/29/1956	Northern States Power	670,920	$17.825	$16.750	$0.050	$0.221	$16.479	$903,058	$11,959,149	$11,056,091	7.551%
7/22/1959	Northern States Power	952,033	$23.375	$22.000	$0.069	$0.191	$21.740	$1,556,574	$22,253,771	$20,697,197	6.995%
7/28/1965	Northern States Power	772,008	$35.250	$33.000	$0.092	$0.225	$32.683	$1,981,745	$27,213,282	$25,231,537	7.282%
1/22/1969	Northern States Power	1,080,811	$29.000	$27.000	$0.119	$0.187	$26.694	$2,492,350	$31,343,519	$28,851,169	7.952%
10/21/1970	Northern States Power	1,729,298	$23.125	$21.500	$0.175	$0.149	$21.176	$3,370,402	$39,990,016	$36,619,614	8.428%
7/26/1972	Northern States Power	1,902,228	$25.000	$23.500	$0.129	$0.166	$23.205	$3,414,499	$47,555,700	$44,141,201	7.180%
10/10/1973	Northern States Power	2,092,451	$25.825	$24.500	$0.128	$0.153	$24.219	$3,360,476	$54,037,547	$50,677,071	6.219%
11/20/1974	Northern States Power	2,300,000	$17.625	$17.500	$0.910	$0.069	$16.521	$2,539,200	$40,537,500	$37,998,300	6.264%
8/14/1975	Northern States Power	1,750,000	$23.000	$23.000	$0.740	$0.077	$22.183	$1,429,750	$40,250,000	$38,820,250	3.552%
6/3/1976	Northern States Power	2,000,000	$24.000	$24.000	$0.720	$0.064	$23.216	$1,568,000	$48,000,000	$46,432,000	3.267%
5/31/1993	Northern States Power	3,041,955	$44.125	$43.625	$1.200	$0.048	$42.377	$5,317,337	$134,226,264	$128,908,927	3.961%
9/23/1997	Northern States Power	4,500,000	$49.938	$49.563	$1.230	$0.133	$48.200	$7,821,000	$224,721,000	$216,900,000	3.480%
9/29/1997	Northern States Power	400,000	$50.500	$49.563	$1.230	$0.133	$48.200	$920,000	$20,200,000	$19,280,000	4.554%
2/25/2002	Xcel Energy, Inc.	20,000,000	$22.950	$22.500	$0.730	$0.015	$21.755	$23,900,000	$459,000,000	$435,100,000	5.207%
9/9/2008	Xcel Energy, Inc.	17,250,000	$20.860	$20.200	$0.100	$0.006	$20.094	$13,218,352	$359,835,000	$346,616,648	3.673%
8/3/2010	Xcel Energy, Inc.	21,850,000	$22.100	$21.500	$0.645	$0.013	$20.571	$33,407,927	$482,885,000	$449,477,073	6.918%
March 2013	Xcel Energy, Inc.	7,757,449	$29.057	$29.057	$0.291	$0.052	$28.714	$2,657,558	$225,407,642	$222,750,085	1.179%
June 2014	Xcel Energy, Inc.	5,693,946	$30.663	$30.663	$0.307	$0.030	$30.326	$1,915,210	$174,592,340	$172,677,130	1.097%
September 2018	Xcel Energy, Inc.	4,733,435	$47.885	$47.885	$0.407	$0.073	$47.405	$2,271,040	$226,661,287	$224,390,247	1.002%
8/29/2019	Xcel Energy, Inc.	9,359,103	$48.416	$48.416	$0.161	$0.041	$48.215	$1,886,029	$453,132,797	$451,246,767	0.416%
11/30/2020	Xcel Energy, Inc.	11,845,000	$60.865	$60.865	$0.665	$0.025	$60.175	$8,168,737	$720,941,187	$712,772,450	1.133%
Nov-Dec 2021	Xcel Energy, Inc.	5,325,674	$65.625	$65.625	$0.558	$0.038	$65.029	$3,175,377	$349,499,767	$346,324,389	0.909%
May 2022	Xcel Energy, Inc.	1,032,571	$72.634	$72.634	$0.617	$0.046	$71.971	$684,896	$75,000,034	$74,315,138	0.913%
June 2022	Xcel Energy, Inc.	1,098,042	$68.303	$68.303	$0.581	$0.013	$67.710	$651,698	$74,999,936	$74,348,239	0.869%
Nov-Dec 2022	Xcel Energy, Inc.	2,170,134	$69.120	$69.120	$0.588	$0.037	$68.495	$1,356,113	$149,999,763	$148,643,651	0.904%
May 2023	Xcel Energy, Inc.	896,275	$68.950	$68.950	$0.586	$0.147	$68.218	$656,624	$61,798,311	$61,141,687	1.063%
Nov 2023	Xcel Energy, Inc.	3,116,417	$60.390	$60.390	$0.513	$0.000	$59.877	$1,599,714	$188,201,629	$186,601,916	0.850%
Weighted Average Flotation Costs							Total Public Issuances	$135,466,874	$4,791,519,948	$4,656,053,074	2.827%
							Total Non-Public Issuances (Employee Benefit Plans)	$0	$1,797,989,000	$1,797,989,000	0.000%
							Total Issuances	$135,466,874	$6,589,508,948	$6,454,042,074	2.056%

The flotation adjustment is derived by dividing the dividend yield by 1-F (where F = flotation costs expressed in percentage terms), or by 0.9794, and adding that result to the constant growth rate to determine the cost of equity. Using the formulas shown previously in my testimony, the Constant Growth DCF calculation is modified as follows to accommodate an adjustment for flotation costs:

Source: Company data.

FLOTATION COST ADJUSTMENT - APPLIED TO PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Expected Dividend Yield Adjusted for Flotation Costs	Value Line Projected EPS Growth Rate	Yahoo! Finance Projected EPS Growth Rate	Zacks Projected EPS Growth Rate	Average Growth Estimate	DCF k(e)	Flotation Adjusted DCF k(e)	
Atmos Energy Corporation	ATO	$3.22	$110.15	2.92%	3.03%	3.09%	7.00%	7.50%	7.30%	7.27%	10.30%	10.36%	
NiSource Inc.	NI	$1.00	$25.47	3.93%	4.09%	4.18%	9.50%	8.30%	7.20%	8.33%	12.42%	12.51%	
Northwest Natural Gas Company	NWN	$1.95	$37.13	5.25%	5.36%	5.48%	6.50%	2.80%	3.70%	4.33%	9.70%	9.81%	
ONE Gas, Inc.	OGS	$2.60	$60.91	4.27%	4.39%	4.48%	6.50%	5.00%	5.00%	5.50%	9.89%	9.98%	
Spire, Inc.	SR	$2.88	$58.30	4.94%	5.11%	5.21%	8.00%	n/a	5.60%	6.80%	11.91%	12.01%	
Mean											10.84%	10.93%	

Flotation Cost Adjusted Cost of Equity - Mean:	10.93%	
UnAdjusted Cost of Equity - Mean:	10.84%	
Difference (Flotation Cost Adjustment):	0.09%	[12]

[1] Bloomberg Professional, equals 30-day average as of November 30, 2023
[2] Bloomberg Professional
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [9])
[5] Equals [4] /(1- [Flotation Cost Percentage])
[6] Value Line
[7] Yahoo! Finance
[8] Zacks
[9] Equals average ([6], [7], [8])
[10] Equals [4] + [9]
[11] Equals [5] + [9]
[12] Equals Mean of [11] - Mean of [10]

CAPITAL STRUCTURE ANALYSIS
NATURAL GAS UTILITY PROXY GROUP

		Most Recent 3 Years (2020-2022)				
Proxy Group Company	Ticker	Common Equity Ratio	Long-Term Debt Ratio	Short-Term Debt Ratio	Preferred Equity Ratio	Total Capitalization
Atmos Energy Corporation	ATO	59.40%	40.60%	0.00%	0.00%	100.00%
NiSource Inc.	NI	54.48%	45.52%	0.00%	0.00%	100.00%
Northwest Natural Gas Company	NWN	44.57%	45.59%	9.84%	0.00%	100.00%
ONE Gas, Inc.	OGS	59.79%	40.21%	0.00%	0.00%	100.00%
Spire, Inc.	SR	49.71%	38.82%	11.47%	0.00%	100.00%
Average		53.59%	42.15%	4.26%	0.00%	
Median		54.48%	40.60%	0.00%	0.00%	
Maximum		59.79%	45.59%	11.47%	0.00%	
Minimum		44.57%	38.82%	0.00%	0.00%	

Notes:
[1] Ratios are weighted by actual common capital, preferred capital, long-term debt and customer deposits of the operating subsidiaries.
[2] Electric and Natural Gas operating subsidiaries with data listed as N/A from S&P Capital IQ have been excluded from the analysis.

CAPITAL STRUCTURE ANALYSIS
COMBINED UTILITY PROXY GROUP

		Most Recent 3 Years (2020-2022)				
Proxy Group Company	Ticker	Common Equity Ratio	Long-Term Debt Ratio	Short-Term Debt Ratio	Preferred Equity Ratio	Total Capitalization
Ameren Corporation	AEE	52.47%	45.63%	1.28%	0.63%	100.00%
Avista Corporation	AVA	47.62%	45.85%	6.53%	0.00%	100.00%
CMS Energy Corporation	CMS	50.13%	48.04%	1.63%	0.20%	100.00%
MGE Energy, Inc.	MGEE	59.55%	37.76%	2.69%	0.00%	100.00%
NiSource Inc.	NI	54.48%	45.52%	0.00%	0.00%	100.00%
NorthWestern Corporation	NWE	48.09%	51.17%	0.74%	0.00%	100.00%
Southern Company	SO	53.83%	44.27%	1.58%	0.31%	100.00%
Wisconsin Energy Corporation	WEC	52.53%	40.99%	6.32%	0.16%	100.00%
Average		52.34%	44.90%	2.60%	0.16%	
Median		52.50%	45.57%	1.60%	0.08%	
Maximum		59.55%	51.17%	6.53%	0.63%	
Minimum		47.62%	37.76%	0.00%	0.00%	

Notes:
[1] Ratios are weighted by actual common capital, preferred capital, long-term debt and customer deposits of the operating subsidiaries.
[2] Electric and Natural Gas operating subsidiaries with data listed as N/A from S&P Capital IQ have been excluded from the analysis.