to-earnings ("P/E") ratio; and (4) a discount rate greater than the expected growth rate. To the extent any of these assumptions is violated, considered judgment and/or specific adjustments should be applied to the results.

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

A: The dividend yield in my Constant Growth DCF model was based on the proxy companies' current annual dividend and average closing stock prices over the most recent 30, 90, and 180 trading days as of June 30, 2022.

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

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

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

A: Yes. 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. To reduce the long-term growth rate to a single measure, one must assume that the dividend payout ratio remains constant and that earnings per share, dividends per share, and book value per share all grow at the same constant rate. Over the long run, however, dividend growth can only be sustained by earnings growth. Therefore, it is important to incorporate a variety of sources of long-term earnings growth rates into the Constant Growth DCF model.

Q: What sources of long-term growth rates did you rely on in your Constant Growth DCF model?

A: My Constant Growth DCF model incorporated three sources of long-term growth rates: (1) consensus long-term earnings growth estimates from Zacks Investment

Research ("Zacks"); (2) consensus long-term earnings growth estimates from Thomson First Call (provided by Yahoo! Finance); and (3) long-term earnings growth estimates from Value Line.

Q: How did you calculate the expected dividend yield?

A: I adjusted the dividend yield to reflect the growth rate that was being used in that particular scenario. This ensures that the growth rate used in the dividend yield calculation and the growth rate used as the "g" term of the DCF model are internally consistent.

Q: How did you calculate a range of results for the Constant Growth DCF model?

A: I calculated the low-end result for the Constant Growth DCF model using the lowest projected earnings growth rate (*i.e.*, the lowest of Thomson First Call, Zacks, and Value Line) for each of the proxy group companies. I calculated the high-end result by using the highest projected earnings growth rate of the three sources for each proxy group company. I calculated the mean results using the mean growth rate of the three sources for each proxy group company.

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

A: Figure 9 (see also Schedule AEB-D2, Attachment 2) summarizes the results of my DCF analyses. As shown, when the average of the three EPS growth rates for each of the proxy group companies is utilized, the median DCF results range from 9.34 percent to 9.41 percent. When the maximum of the three EPS growth rates for each of the proxy group companies is utilized, the median DCF results range from 10.38

percent to 10.53 percent. While I also summarize the median DCF results relying on the minimum growth rate for each proxy group company, I do not believe that these DCF results provide a reasonable spread over the expected yields on Treasury bonds to compensate investors for the incremental risk related to an equity investment.

FIGURE 9: SUMMARY OF CONSTANT GROWTH DCF RESULTS

	Constant Growth DCF		
	Minimum Growth Rate (Median)	Average Growth Rate (Median)	Maximum Growth Rate (Median)
30-Day Average	8.11%	9.34%	10.38%
90-Day Average	8.09%	9.37%	10.37%
180-Day Average	8.21%	9.41%	10.53%
Constant Growth Average	8.14%	9.37%	10.43%

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

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

VI.C. Capital Asset Pricing Model

Q: Please briefly describe the CAPM.

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

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

Where:

K_e = the required market ROE;

β = beta coefficient of an individual security;

r_f = the risk-free ROR; 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, since unsystematic risk can be diversified away, investors should only be concerned with systematic or non-diversifiable risk. Non-diversifiable risk is measured by beta, which is defined as:

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

The variance of the market return (*i.e.*, Variance (r_m)) is a measure of the uncertainty of the general market, and the covariance between the return on a specific security and the general market (*i.e.*, Covariance (r_e, r_m)) 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 did you use in your CAPM analysis?

A: In my CAPM analysis, I utilized three estimates of the risk-free rate: (1) the current 30-day average yield on 30-year U.S. Treasury bonds, which is 3.18 percent;[52] (2) the projected 30-year U.S. Treasury bond yield for Q4 2022 through Q4 2023 (*i.e.*, 3.74 percent);[53] and (3) the projected 30-year U.S. Treasury bond yield for 2023 through 2027 (*i.e.*, 3.80 percent).[54]

Q: Would you place more weight on one of these scenarios?

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

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52 Bloomberg Professional, as of June 30, 2022.

53 Blue Chip Financial Forecasts, Vol. 41, No. 7, July 1, 2022, at 2.

54 Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14.

consideration the effect of the market's expectations for interest rate increases on the cost of equity.

Q: What beta coefficients did you use in your CAPM analysis?

A: As shown in Schedule AEB-D2, Attachment 4, I used the average beta coefficients for the proxy group companies as reported by Bloomberg and Value Line. The beta coefficients reported by Bloomberg are based on ten years of weekly returns relative to the S&P 500 Index. The beta coefficients reported by Value Line are based on five years of weekly returns relative to the New York Stock Exchange Composite Index. As shown in Schedule AEB-D2, Attachment 3, I also considered an additional CAPM analysis that relies on the long-term average utility beta coefficient for the companies in the proxy group, which is calculated as an average of the beta coefficients reported by Value Line from 2016 through 2021.

Q: How did you estimate the market risk premium in the CAPM?

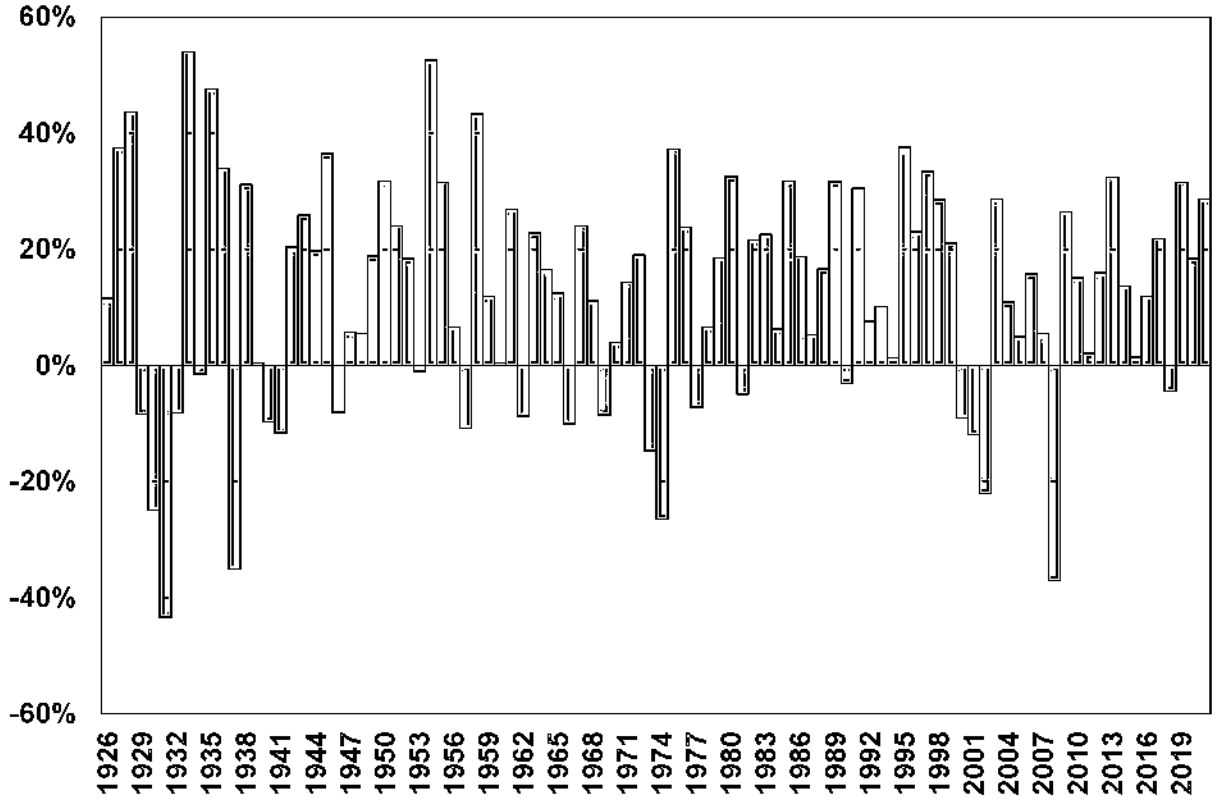
A: I estimated the market risk premium as the difference between the implied expected equity market return and the risk-free rate. The expected market return on the S&P 500 Index is calculated using the Constant Growth DCF model discussed earlier in my testimony for the companies in the S&P 500 Index for which dividend yields and Value Line long-term earnings projections are available. As shown in Schedule AEB-D2, Attachment 6, based on an estimated market capitalization-weighted dividend yield of 1.83 percent and a weighted long-term growth rate of 11.02 percent, the estimated required market return for the S&P 500 Index is 12.94

percent. The implied market risk premium over the risk-free rates (*i.e.*, the current, near-term projected and longer-term projected 30-year U.S. Treasury bond yield) ranges from 9.14 percent to 9.76 percent.

Q: How does the current expected market return compare to observed historical returns?

A: Given the range of annual equity returns that have been observed over the past century as shown in Figure 10, a current expected equity return of 12.94 percent is not unreasonable. In 50 out of the past 96 years (or roughly 52 percent of observations), the realized equity return was at least 12.94 percent.

FIGURE 10: REALIZED U.S. EQUITY MARKET RETURNS (1926-2021)[55]



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

A: Yes. I have also considered the results of an ECAPM in estimating the cost of equity for the Company.[56] 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:

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[55] Depicts total annual returns on large company stocks, as reported in the 2022 Duff & Phelps SBBI Yearbook.

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

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

Where:

k_e = the required market ROE

β = Adjusted beta coefficient of an individual security

r_f = the risk-free rate of return

r_m = the required return on the market as a whole

In essence, the ECAPM addresses the tendency of the "traditional" CAPM to underestimate the cost of equity for companies with beta coefficients less than 1.00 such as regulated utilities. In that regard, the ECAPM is not redundant to the use of adjusted betas reflected in the analysis, but rather recognizes the results of academic research indicating that the risk-return relationship is different (in essence, flatter) than estimated by the CAPM, and that the CAPM underestimates the "alpha," or the constant return term.[57]

The ECAPM analysis relies on the same inputs as used in the CAPM (*i.e.*, the current, near-term and longer-term yields on the 30-year Treasury bond as the risk-free rate; the forward-looking market risk premium estimates; and the Bloomberg, Value Line and long-term average beta coefficients).

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

A: Figure 11 (and also Schedule AEB-D2, Attachment 4) presents the range of the results produced by the CAPM and ECAPM analyses. As shown, the traditional

[57] *Id.*, at 191.

CAPM analysis produces a range of returns from 10.47 percent to 11.73 percent. The ECAPM analysis results range from 11.09 percent to 12.03 percent.

FIGURE 11: SUMMARY OF CAPM / ECAPM RESULTS

	CAPM Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.65%	11.73%	11.73%
Bloomberg Beta	11.20%	11.30%	11.31%
Long-term Avg. Beta	10.47%	10.61%	10.62%
	ECAPM		
Value Line Beta	11.97%	12.03%	12.03%
Bloomberg Beta	11.64%	11.71%	11.72%
Long-term Avg. Beta	11.09%	11.19%	11.20%

VI.D. Bond Yield Plus Risk Premium Analysis

Q: Please describe the Bond Yield Plus Risk Premium 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 a bondholder. That is, because returns to equity holders have greater risk than returns to bondholders, equity investors must be compensated to bear that risk. Risk premium approaches, therefore, estimate the cost of equity as the sum of the equity risk premium and the yield on a particular class of bonds. In my analysis, I used actual authorized returns for electric utility companies as the historical measure of the cost of equity to determine the risk premium.

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

A: Yes. It is important to recognize both academic literature and market evidence indicating that the equity risk premium (as used in this approach) is inversely related to the level of interest rates. That is, as interest rates increase (decrease), the equity risk premium decreases (increases). Consequently, it is important to develop an analysis that: (1) reflects the inverse relationship between interest rates and the equity risk premium; and (2) relies on recent and expected market conditions. Such an analysis can be developed based on a regression of the risk premium as a function of U.S. Treasury bond yields. If we let authorized ROEs for electric utilities serve as the measure of required equity returns and define the yield on the long-term U.S. Treasury bond as the relevant measure of interest rates, the risk premium simply would be the difference between those two points.[58]

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

A: Yes. Investors are aware of ROE awards in other jurisdictions, and they consider those awards as a benchmark for a reasonable level of equity returns for utilities of comparable risk operating in other jurisdictions. Because my Bond Yield Plus Risk Premium analysis is based on authorized ROEs for utility companies relative to

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

corresponding Treasury yields, it provides relevant information to assess the return expectations of investors.

Q: Did you conduct an analysis of the relationship between equity risk premia and interest rates?

A: Yes. As shown in Figure 12, from 1992 through June 2022, there was a strong negative relationship between risk premia and interest rates. To estimate that relationship, I conducted a regression analysis using the following equation:

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

Where:

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

a = intercept term

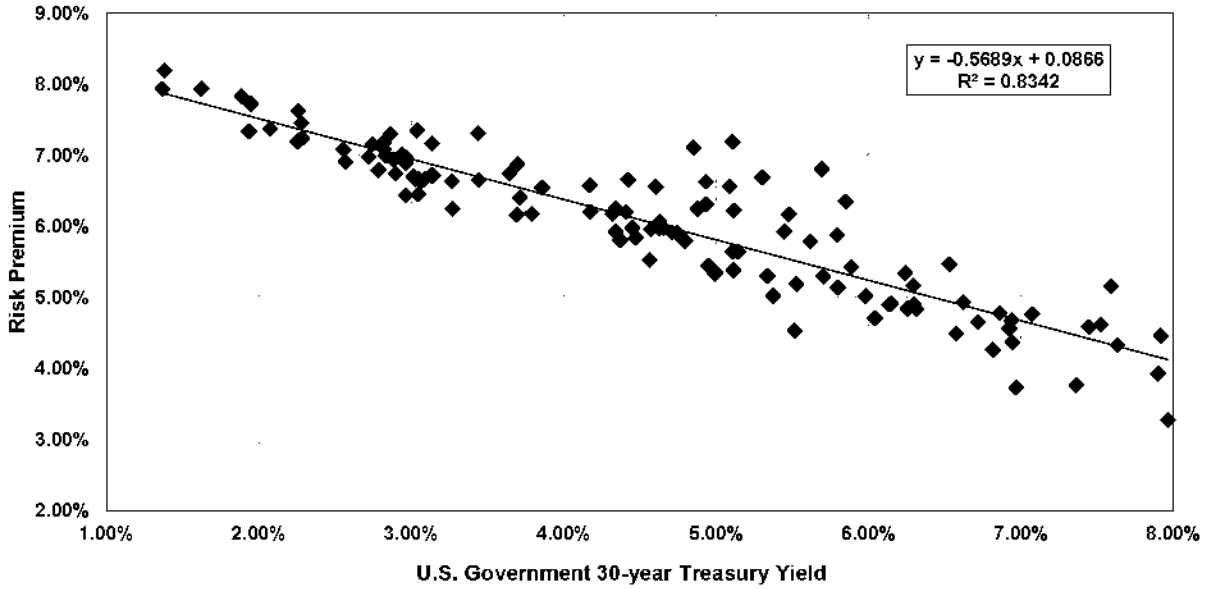
b = slope term

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

Data regarding allowed ROEs were derived from vertically integrated electric utility rate cases from 1992 through June 2022 as reported by Regulatory Research Associates ("RRA").[59] This equation's coefficients were statistically significant at the 99.00 percent level.

[59] Authorized ROE results from limited issue rider cases, transmission-only cases, distribution cases, and cases that were silent with respect to the authorized ROE are excluded from this analysis.

FIGURE 12: RELATIONSHIP OF RISK PREMIA AND INTEREST RATES



Q: Based on the relationship between equity risk premia and interest rates, what are the results of your Bond Yield Plus Risk Premium analysis?

A: Figure 13 presents the results of my Bond Yield Plus Risk Premium analysis based on the current and projected interest rates used in my CAPM and ECAPM analyses: (1) the current 30-day average yield on 30-year U.S. Treasury bonds; (2) the near-term projected 30-year U.S. Treasury bond yield; and (3) the long-term projected 30-year U.S. Treasury bond yield.

FIGURE 13: BOND YIELD PLUS RISK PREMIUM RESULTS

	Bond Yield Plus Risk Premium		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium Results	10.03%	10.27%	10.29%

Q: How did the results of the Bond Yield Plus Risk Premium inform your recommended ROE for the Company?

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

VII. REGULATORY AND BUSINESS RISKS

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

A: No. These results provide only a range of the appropriate estimate of the Company's cost of equity. There are several additional factors that must be taken into consideration when determining where the Company's cost of equity falls within the range of results. These factors, which are discussed below, should be considered with respect to their overall effect on the Company's risk profile.

VII.A. Capital Expenditures

Q: Please summarize the Company's capital expenditure requirements.

A: The Company currently plans to invest in significant capital expenditures from 2022 through 2026, largely associated with its Smart Energy Plan enabled by the Missouri Legislature's passage of Senate Bill 564 in 2018 and as amended in 2022. As Company witness Warren Wood describes in more detail in his direct testimony, the Smart Energy Plan is designed to upgrade Ameren Missouri's electric infrastructure through grid modernization investments as well as to accommodate more renewable energy.[60]

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

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

Q: Do credit rating agencies recognize the risks associated with elevated levels of capital expenditures?

A: Yes. From a credit perspective, the additional pressure on cash flows associated with high levels of capital expenditures exerts corresponding pressure on credit

[60] Ameren Corporation, Form 10-K, February 22, 2022, at 22 and 40.

metrics and, therefore, credit ratings. To that point, S&P explains the importance of regulatory support for a significant amount of capital projects:

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

Q: Does Ameren Missouri have cost recovery mechanisms in place to recover the costs associated with its capital expenditures plan between rate cases?

A: Yes. Ameren Missouri has implemented Plant-In-Service Accounting ("PISA"), which was established in 2018 through Senate Bill 564 and amended by Senate Bill 745 in 2022. PISA provides for the deferral of 85 percent of the depreciation and

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

return on capital investment between rate cases. Specifically, Senate Bill 564, as amended by Senate Bill 745, provides that utilities who elect to use PISA shall:

> [D]efer to a regulatory asset eighty-five percent of all depreciation expense and return associated with all qualifying electric plant recorded to plant-in-service on the utility's books… In each general rate proceeding concluded after the effective date of this section, the balance of the regulatory asset as of the rate base cutoff date shall be included in the electrical corporation's rate base without any offset, reduction, or adjustment based upon consideration of any other factor...[62]

Thus, the PISA permits Ameren Missouri to defer and recover 85 percent of the depreciation expense and earn a return at the applicable WACC on investments in certain property, plant, and equipment placed in service, and not included in base rates. The regulatory asset for accumulated PISA deferrals also earns a return at the applicable WACC, with all approved PISA deferrals added to rate base prospectively and recovered over a period of 20 years following a regulatory rate review.

Q: Is PISA limited in any respects?

A: Yes. The amended statute governing PISA has an expiration date on the deferrals of December 31, 2028, after which time regulatory approval for continuance through December 31, 2033 is required, and even if extended, the mechanism is set to permanently expire at the end of 2033. Also, there are caps on the impact to rate and revenue requirement that would limit the recovery thorugh the PISA. Through

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[62] Senate Bill No. 564, General Assembly of the State of Missouri 2018, as amended by SB 745, General Assembly of the State of Missouri 2022.

the end of 2023, Ameren Missouri's rate increases are limited to a 2.85 percent compound annual growth rate in the average overall customer rate per kilowatt-hour, based on the electric rates that became effective in April 2017, less half of the annual savings from the Tax Cuts and Jobs Act that were previously passed on to customers by the Company.[63] Therefore, if the rate cap is reached, the recovery of capital through the PISA is limited on a forward-looking basis, and the Company would depend on rate case filings for capital cost recovery. Post December 31, 2023, the rate cap of a compound annual growth rate of 2.85 percent is being replaced by a cap on the revenue requirement impact of the PISA deferrals. This revenue requirement impact cap grows at a rate of 2.50 percent annually between rate reviews (*e.g.,* if there are two years between rate reviews the impact of the PISA deferrals are capped at 5 percent).

Q: Have credit rating agencies commented on PISA and the Company's ability to recover capital expenditures?

A: Yes. Moody's has highlighted the constructive legislative and regulatory environment in Missouri, and that the Company benefits from PISA generally; however, has also noted that the limitations just discussed are credit negative, although mitigated by the fact that Moody's believes the Company has sufficient headroom under the cap so as to support the Company's cost recovery requirements.[64] Moody's has stated that, "[n]evertheless, regulatory lag remains

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[63] Ameren Corporation, Form 10-K, February 22, 2022, at 22.

[64] Moody's Investors Service, Inc., Credit Opinion, Union Electric Company, September 13, 2021, at 1.

due to the use of historical test year, limited infrastructure trackers or riders."[65] Moody's provided more detail stating:

> **[redacted]**

Similarly, prior to its approval, S&P noted that approving the extension of the PISA through December 31, 2033 would reduce regulatory lag for the Company beyond the prior sunset date in 2028.[67]

Q: How does Ameren Missouri's capital cost recovery compare to the operating subsidiaries of the proxy group companies?

A: As shown in Schedule AEB-D2 Attachment 10, there are a number of cost recovery mechanisms in place for the operating subsidiaries of the proxy group companies, including forecasted test years, year-end rate base convention, revenue decoupling, formula-based rates, straight-fixed variable rate design, and capital cost recovery mechanisms and/or the opportunity for construction work in progress ("CWIP") in

[65] Moody's Investors Service, Inc., Credit Opinion, Union Electric Company, April 3, 2020, at 1.

[66] *Id.*, at 3-4.

[67] S&P Global Ratings, Ratings Direct, Union Electric Co. d/b/a Ameren Missouri, April 28, 2021, at 2.

rate base. Approximately 55 percent of the operating subsidiaries of the proxy group companies recover costs through some form of capital tracking mechanism. Ameren Missouri does not have many of these mechanisms, and Missouri law prohibits CWIP in rate base.[68] Further, while Ameren Missouri is limited from earning a return on CWIP by Missouri statutes, which can reduce regulatory lag, the opportunity to earn a return on CWIP is available for 82% of the operating subsidiaries of the proxy group companies.

Q: Does the Company have any other cost recovery mechanisms?

A: Yes. The Company also has the Renewable Energy Standard Rate Adjustment Mechanism ("RESRAM"). The RESRAM enables the Company to recover between rate cases the costs relating to compliance with Missouri's renewable energy standard, including investments in wind generation and other renewables.[69] Under the RESRAM, the Company can earn a return at the applicable weighted average cost of capital on those investments not already recovered elsewhere from customers.[70] Additionally, under the RESRAM, Ameren Missouri is permitted to recover the 15% of depreciation expense and return not deferred and recovered under the PISA mechanism for RESRAM eligible investments.[71]

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[68] S&P Capital IQ Pro, Commission Profiles, Missouri.

[69] Missouri Statute Section 393.1030.2(4).

[70] Ameren Corporation, Form 10-K, February 22, 2022, at 3.

[71] *Id.*, at 67-68.

Q: Is regulatory lag eliminated by the PISA and RESRAM mechanisms?

A: No, not entirely. As noted, PISA is applied to only 85 percent of the depreciation and return for certain qualified investments. In addition, while PISA does allow deferral of depreciation and return on 85 percent of the eligible investment, the utility's net income is negatively impacted between rate cases because the equity portion of that return cannot be included in the utility's reported earnings. Moreover, the return associated with the remaining 15 percent of investment not included in the PISA recovery mechanism and not otherwise recovered through the RESRAM, is foregone until rates are reset in the next rate proceeding. Further, while PISA provides a process for including new projects in rate base, PISA does not provide the ability to put CWIP into rate base. Rather, PISA only provides a process for getting completed projects into rate base. Therefore, this mechanism does not provide earnings and cash flow relief similar to other jurisdictions where CWIP can be placed into rate base.

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

A: The Company's capital expenditure requirements are significant and will continue at least through 2026. Additionally, while Ameren Missouri has the PISA and RESRAM mechanisms to recover a portion of qualifying capital costs, the mechanisms do not provide for timely recovery of all of Ameren Missouri's capital expenditures. Considering a number of the operating subsidiaries of the proxy group have a capital tracking mechanism and/or are able to include CWIP in rate base, in comparison,

the Company lacks a comprehensive forward-looking mechanism or set of mechanisms, such as including CWIP in rate base, that would remedy the regulatory lag it faces. As a result, the Company has relatively greater risk of timely cost recovery and earnings potential as compared to the proxy group companies.

VII.B. Regulatory Risk

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 authorities recognize that because utility operations are capital intensive, regulatory decisions should enable the utility to attract capital at reasonable terms; doing so balances the long-term interests of investors and customers. The Company is no exception. Ameren Missouri must finance its operations and requires the opportunity to earn a reasonable return on its invested capital to maintain its financial profile. 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 Company to generate the cash flow needed to meet its near-term financial obligations, make the capital investments needed to maintain and expand its system, 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, the Company'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, on the other hand, require that the authorized return be adequate to provide a risk-comparable return on the equity portion of the Company's capital investments. Because equity investors are the residual claimants on the Company's cash flows (which is to say that the equity return is subordinate to debt repayment), they are particularly concerned with the strength of regulatory support and its effect on future earnings and cash flows.

Q: How do credit rating agencies consider regulatory risk in establishing a company's credit rating?

A: Both S&P and Moody's consider the overall regulatory framework in establishing credit ratings. Moody's establishes credit ratings based on four key factors: (1) regulatory framework; (2) the ability to recover costs and earn returns; (3) diversification; and (4) financial strength, liquidity, and key financial metrics. Of these criteria, regulatory framework, and the ability to recover costs and earn returns are each given a broad rating factor of 25.00 percent. Therefore, Moody's assigns regulatory risk a 50.00 percent weighting in the overall assessment of business and financial risk for regulated utilities.[72]

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

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."[73] 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.[74]

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

A: The regulatory environment can significantly affect both the access to and cost of capital in several ways. First, the proportion and cost of debt capital available to utility companies are influenced by the rating agencies' assessment of the regulatory environment. As noted by Moody's, "[f]or rate regulated utilities, which typically operate as a monopoly, the regulatory environment and how the utility adapts to that environment are the most important credit considerations."[75] Moody's further highlights 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

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[73] 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.

[74] *Id.*, at 1.

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

of rates), as well as the predictability and consistency of decision-making provided by that foundation."[76]

Q: Have you evaluated the regulatory framework in Missouri relative to the jurisdictions in which the operating companies of the proxy group members operate?

A: Yes. I have evaluated the regulatory framework in Missouri on four factors that are important in terms of providing a regulated utility an opportunity to earn its authorized ROE. These are: (1) test year convention (*i.e.*, forecast vs. historical test year); (2) method for determining rate base (*i.e.*, average vs. year-end); (3) use of revenue decoupling mechanisms or other tools to mitigate volumetric risk; and (4) 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 summarized as follows, and the details are shown in Schedule AEB-D2, Attachment 10. Specifically:

> *Test Year Convention*: Ameren Missouri uses a historical test year with limited "known and measurable" changes through a true-up period.[55] By contrast, 52 percent of the operating companies of the proxy group provide service in jurisdictions that use a fully- or partially-forecasted test year.
>
> *Rate Base Convention*: The Company's rate base is determined using the year-end rate base method, meaning that the rate base includes capital additions that occurred in the second half of the test year and is more reflective of net utility plant going forward. Approximately 45 percent of the companies in the proxy group are also authorized to use year-end rate base.

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[76] *Id.*

Volumetric Risk: Ameren Missouri does have partial protection against volumetric risk in Missouri through an Energy Efficiency Adjustment Charge; however, this charge only allows the Company to recover the costs associated with the impact on sales from energy efficiency and does not address other volumetric risk. By comparison, 54 percent of the operating companies in the proxy group also have some form of protection against volumetric risk through either revenue decoupling, formula-based rates and/or straight-fixed variable rate design.

Capital Cost Recovery: As discussed, Ameren Missouri has capital tracking mechanisms (*i.e.*, PISA and the RESRAM for renewable energy standard compliance assets) to recover capital investment costs between rate cases. However, as discussed previously, Ameren Missouri's PISA capital cost recovery mechanism has limitations, including that it is applicable to only 85 percent of the investment, has a rate cap (through 2023), and has a PISA revenue requirement impact cap starting in 2024. Similarly, approximately 55 percent of the operating companies held by the proxy group have some form of capital cost recovery mechanism in place.

Fuel Adjustment Clause: Ameren Missouri's fuel adjustment clause allows the Company to defer and recover 95 percent of the difference between the actual net energy costs and net base energy costs.[77] Fuel adjustment clause mechanisms are prevalent for the operating subsidiaries of the proxy companies, as 97 percent of the operating companies in the proxy group are allowed to directly recover fuel costs and purchased power costs from customers, without either a dead band or sharing band. Since FAC mechanisms are prevalent in the proxy group, the continuation of a FAC for Ameren Missouri makes the Company more comparable to the proxy group. To the extent that the fuel adjustment clause were eliminated, or materially restructured to recover a smaller proportion of the actual fuel costs, Ameren Missouri would have greater risk than the proxy group and would likely require an upward adjustment to the ROE to reflect this incremental risk.

[77] File No. ER-2019-0335, In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Decrease Its Revenues for Electric Service, Non-Unanimous Stipulation and Agreement, Exhibit F.

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

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

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

A: RRA develops their ranking based on their assessment of how investors perceive the regulatory risk associated with ownership of utility securities in that jurisdiction, specifically reflecting their assessment of the probable level and quality of earnings to be realized by the state's utilities as a result of regulatory, legislative, and court actions. RRA assigns a ranking for each regulatory jurisdiction as "Above Average", "Average" or "Below Average", and then within each of those categories, a numeric ranking from 1 to 3. Thus, there are a total of nine RRA rankings, with the rankings for each jurisdiction ranging from "Above Average/1", which is considered the most supportive, to "Below Average/3," which is the least supportive. I applied a numeric ranking system to the RRA rankings with "Above Average/1" assigned the highest ranking (*i.e.*, a "1") and "Below Average/3" assigned the lowest ranking (*i.e.*, a "9").

As shown on Schedule AEB-D2, Attachment 11, the Missouri jurisdictional ranking is "Average / 3" (*i.e.*, a "6"), which is below the proxy group average ranking of between "Average/1" and "Average/2" (*i.e.*, a "4.5").

Q: How did you conduct your analysis of the S&P credit supportiveness?

A: For credit supportiveness, S&P classifies each regulatory jurisdiction into five categories that range from "Most Credit Supportive" down to "Credit Supportive." My analysis of the credit supportiveness of the regulatory jurisdictions in which the proxy companies operate as compared to the Company's regulatory jurisdiction was similar to the analysis of the RRA overall regulatory ranking discussed above. Specifically, I assigned a numerical ranking to each category, from Most Credit Supportive (*i.e.*, a "1") to Credit Supportive (*i.e.*, a "5"). As shown on Schedule AEB-D2, Attachment 12, similar to the RRA regulatory rankings discussed above, the Missouri jurisdictional classification of "Very Credit Supportive" (*i.e.*, a "3") is below the proxy group average ranking of 2.43, which would be classified between "Highly Credit Supportive" and "Very Credit Supportive" (*i.e.*, a "2.43").

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

A: Yes, they do. In fact, in a recent article from Barron's, an equity analyst from KeyBanc Capital Markets, Inc. recommended buying shares in Duke Energy as opposed to Consolidated Edison for reasons which included that the regulatory

outcomes in the jurisdictions where Duke Energy operates were more favorable. Specifically, KeyBank analyst Sophie Karp noted:

> The regulatory environment is favorable in Duke's major markets: the Carolinas, Florida, and Indiana. "There's not so much of the utility bashing that goes on down there as it is in New York routinely," says KeyBanc's Karp. "So they have more constructive outcomes. They have better returns." A starting point of below-average customer bills helps. So does healthy population growth. New York has neither.[78]

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

A: Yes, they do. To the extent that the returns in a jurisdiction are lower than the returns that have been authorized more broadly, credit rating agencies will consider this in the overall risk assessment of the regulatory jurisdiction in which the company operates. It is important to consider credit ratings because they affect the overall cost of borrowing, and they act as a signal to equity investors about the risk of investing in the equity of a company. Therefore, lower credit ratings can affect both the cost of debt and equity.

In addition to the credit rating downgrade experienced by PNW previously discussed as a result of a negative rate case outcome, examples of other recent credit rating agency responses include ALLETE, Inc. and CenterPoint Energy Houston Electric ("CEHE"). Specifically, in 2019, Moody's downgraded ALLETE, Inc. from A3 to Baa1 primarily based on what Moody's noted was a below average authorized ROE of

[78] Hough, Jack, "3 Electric Utility Stocks to Give Your Portfolio a Jolt," Barron's, July 26, 2021; www.barrons.com/articles/-utility-stocks-duke-energy-51627080936?mod=hp_columnists.

9.25 percent in Minnesota Power's fully litigated rate case in Minnesota.[79] Similarly, FitchRatings downgraded CEHE's Long-Term Issuer Default rating from A- to BBB+ and revised the rating outlook from Stable to Negative following the approval of an unfavorable outcome in a recent rate case in Texas.[80]

VIII. Conclusions And Recommendations

Q: What is your conclusion regarding a fair ROE for Ameren Missouri?

A: Figure 14 provides a summary of my analytical results for the proxy group. Based on these results, the qualitative analyses presented herein, the current and projected conditions in capital markets including the expectation for rising interest rates and increase in inflationary pressure, and the business and financial risks of Ameren Missouri compared to the proxy group, it is my view that a ROE in the range of 9.90 to 11.25 percent is reasonable, and that the Company's proposed ROE of 10.20 percent is reasonable and would fairly balance the interests of customers and shareholders. This ROE would enable the Company to attract capital at reasonable rates under a variety of economic and financial market conditions, while continuing to provide safe, reliable, and affordable electric utility service to customers in Missouri.

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[79] Moody's Investors Service, Inc., Credit Opinion: ALLETE, Inc. Update following downgrade, April 3, 2019, at 3.

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

FIGURE 14: SUMMARY OF ANALYTICAL RESULTS

	Constant Growth DCF		
	Minimum Growth Rate (Median)	Average Growth Rate (Median)	Maximum Growth Rate (Median)
30-Day Average	8.11%	9.34%	10.38%
90-Day Average	8.09%	9.37%	10.37%
180-Day Average	8.21%	9.41%	10.53%
Constant Growth Average	8.14%	9.37%	10.43%
	CAPM		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.65%	11.73%	11.73%
Bloomberg Beta	11.20%	11.30%	11.31%
Long-term Avg. Beta	10.47%	10.61%	10.62%
	ECAPM		
Value Line Beta	11.97%	12.03%	12.03%
Bloomberg Beta	11.64%	11.71%	11.72%
Long-term Avg. Beta	11.09%	11.19%	11.20%
	Bond Yield Plus Risk Premium		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium Results	10.03%	10.27%	10.29%

Q: Does this conclude your Direct Testimony?

A: Yes.

Brattle

Ann E. Bulkley

PRINCIPAL

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With more than 25 years of experience in the energy industry, Ms. Bulkley specializes in regulatory economics for the electric and natural gas sectors, including rate of return, cost of equity, 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 several 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.

- 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.
- Prepared fair value rate base analyses for Northern Indiana Public Service Company for several electric rate proceedings. Valuation approaches used in this project included income, cost, and comparable sales approaches.
- 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 for and prepared appraisal reports of generation assets to be used in ad valorem tax disputes.
- 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.

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

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Oklahoma Gas and Electric Co	10/21	Oklahoma Gas and Electric Co	Docket No. D-18-046-FR	Return on Equity
Arkansas Oklahoma Gas Corporation	10/13	Arkansas Oklahoma Gas Corporation	Docket No. 13-078-U	Return on Equity
California Public Utilities Commission				
Pacificorp, d/b/a Pacific Power	5/22	Pacificorp, d/b/a Pacific Power		Return on Equity
San Jose Water Company	05/21	San Jose Water Company	A2105004	Return on Equity
Colorado Public Utilities Commission				
Public Service Company of Colorado	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				
United Illuminating	05/21	United Illuminating	Docket No. 17-12-03RE11	Return on Equity
Connecticut Water Company	01/21	Connecticut Water Company	Docket No. 20-12-30	Return on Equity

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

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Tallgrass Interstate Gas Transmission	10/15	Tallgrass Interstate Gas Transmission	RP16-137	Return on Equity
Idaho Public Utilities Commission				
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				
Illinois American Water	02/22	Illinois American Water	Docket No. 22-0210	Return on Equity
North Shore Gas Company	02/21	North Shore Gas Company	No. 20-0810	Return on Equity
Indiana Utility Regulatory Commission				
Indiana Michigan Power Co.	07/21	Indiana Michigan Power Co.	IURC Cause No. 45576	Return on Equity
Indiana Gas Company Inc.	12/20	Indiana Gas Company Inc.	IURC Cause No. 45468	Return on Equity
Southern Indiana Gas and Electric Company	10/20	Southern Indiana Gas and Electric Company	IURC Cause No. 45447	Return on Equity
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

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
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	01/22	MidAmerican Energy Company	Docket No. RPU-2022-0001	Return on Equity
Iowa-American Water Company	08/20	Iowa-American Water Company	Docket No. RPU-2020-0001	Return on Equity
Kansas Corporation Commission				
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	11/18	Kentucky American Water Company	Docket No. 2018-00358	Return on Equity
Maine Public Utilities Commission				
Central Maine Power	10/18	Central Maine Power	Docket No. 2018-194	Return on Equity
Maryland Public Service Commission				
Maryland American Water Company	06/18	Maryland American Water Company	Case No. 9487	Return on Equity
Massachusetts Appellate Tax Board				
Hopkinton LNG Corporation	03/20	Hopkinton LNG Corporation	Docket No.	Valuation of LNG Facility

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

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
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				
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

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

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

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Niagara Mohawk Power Corporation	07/20	National Grid USA	Case No. 20-E-0380 20-G-0381	Return on Equity
Corning Natural Gas Corporation	02/20	Corning Natural Gas Corporation	Case No. 20-G-0101	Return on Equity
New York State Electric and Gas Company Rochester Gas and Electric	05/19	New York State Electric and Gas Company Rochester Gas and Electric	19-E-0378 19-G-0379 19-E-0380 19-G-0381	Return on Equity
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 KeySpan Energy Delivery	04/16 01/16	National Fuel Gas Company KeySpan Energy Delivery	Case No. 16-G-0257 Case No. 15-G-0058 Case No. 15-G-0059	Return on Equity 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				

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Montana-Dakota Utilities Co.	05/22	Montana-Dakota Utilities Co.	C-PU-22-194	Return on Equity
Montana-Dakota Utilities Co.	08/20	Montana-Dakota Utilities Co.	C-PU-20-379	Return on Equity
Northern States Power Company	12/12	Northern States Power Company	C-PU-12-813	Return on Equity
Northern States Power Company	12/10	Northern States Power Company	C-PU-10-657	Return on Equity
Oklahoma Corporation Commission				
Oklahoma Gas & Electric	12/21	Oklahoma Gas & Electric	Cause No. PUD 202100164	Return on Equity
Arkansas Oklahoma Gas Corporation	01/13	Arkansas Oklahoma Gas Corporation	Cause No. PUD 201200236	Return on Equity
Oregon Public Service Commission				
PacifiCorp d/b/a Pacific Power & Light	03/22	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-399	Return on Equity
PacifiCorp d/b/a Pacific Power & Light	02/20	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-374	Return on Equity
Pennsylvania Public Utility Commission				
American Water Works Company Inc.	04/22	Pennsylvania-American Water Company	Docket No. R-2020-3031672 (water) Docket No. R-2020-3031673 (wastewater)	Return on Equity
American Water Works Company Inc.	04/20	Pennsylvania-American Water Company	Docket No. R-2020-3019369 (water) Docket No. R-2020-3019371 (wastewater)	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
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
Utah Public Service Commission				
PacifiCorp d/b/a Rocky Mountain Power	05/20	PacifiCorp d/b/a Rocky Mountain Power	Docket No. 20-035-04	Return on Equity
Virginia State Corporation Commission				
Virginia American Water Company, Inc.	11/21	Virginia American Water Company, Inc.	Docket No. PUR-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				
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				

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
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
Wisconsin Public Service Commission				
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	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 and the State of New Hampshire

SUMMARY OF ROE ANALYSES RESULTS

	Constant Growth DCF		
	Minimum Growth Rate (Median)	Average Growth Rate (Median)	Maximum Growth Rate (Median)
30-Day Average	8.11%	9.34%	10.38%
90-Day Average	8.09%	9.37%	10.37%
180-Day Average	8.21%	9.41%	10.53%
Constant Growth Average	8.14%	9.37%	10.43%
	CAPM		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.65%	11.73%	11.73%
Bloomberg Beta	11.20%	11.30%	11.31%
Long-term Avg. Beta	10.47%	10.61%	10.62%
	ECAPM		
Value Line Beta	11.97%	12.03%	12.03%
Bloomberg Beta	11.64%	11.71%	11.72%
Long-term Avg. Beta	11.09%	11.19%	11.20%
	Bond Yield Plus Risk Premium		
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium Results	10.03%	10.27%	10.29%

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30-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line EPS Growth	[6] Yahoo! Finance EPS Growth	[7] Zacks EPS Growth	[8] Average Growth Rate	[9] ROE - Minimum Growth Rate	[10] ROE - Average Growth Rate	[11] ROE - Maximum Growth Rate
ALLETE, Inc.	ALE	$2.60	$60.15	4.32%	4.49%	6.00%	8.70%	8.70%	7.80%	10.45%	12.29%	13.21%
Alliant Energy Corporation	LNT	$1.71	$59.23	2.89%	2.97%	6.00%	5.40%	5.70%	5.70%	8.37%	8.67%	8.97%
American Electric Power Company, Inc.	AEP	$3.12	$97.30	3.21%	3.31%	6.50%	6.21%	6.20%	6.30%	9.51%	9.61%	9.81%
Duke Energy Corporation	DUK	$3.94	$107.38	3.67%	3.78%	6.00%	5.91%	6.10%	6.00%	9.69%	9.78%	9.88%
Entergy Corporation	ETR	$4.04	$114.20	3.54%	3.64%	4.00%	6.04%	6.70%	5.58%	7.61%	9.22%	10.36%
Evergy, Inc.	EVRG	$2.29	$66.26	3.46%	3.56%	7.50%	4.95%	6.10%	6.18%	8.49%	9.75%	11.09%
IDACORP, Inc.	IDA	$3.00	$104.96	2.86%	2.90%	4.00%	2.80%	2.80%	3.20%	5.70%	6.10%	6.92%
NextEra Energy, Inc.	NEE	$1.70	$75.27	2.26%	2.37%	12.50%	9.02%	9.20%	10.24%	11.38%	12.61%	14.90%
NorthWestern Corporation	NWE	$2.52	$59.33	4.25%	4.32%	3.00%	4.50%	2.30%	3.27%	6.60%	7.58%	8.84%
OGE Energy Corporation	OGE	$1.64	$38.94	4.21%	4.30%	6.50%	1.90%	3.50%	3.97%	6.15%	8.26%	10.85%
Otter Tail Corporation	OTTR	$1.65	$64.97	2.54%	2.63%	4.50%	9.00%	n/a	6.75%	7.10%	9.38%	11.65%
Portland General Electric Company	POR	$1.81	$48.19	3.76%	3.85%	7.50%	3.23%	4.40%	5.04%	7.05%	8.89%	11.40%
Southern Company	SO	$2.72	$72.04	3.78%	3.88%	6.50%	6.10%	4.00%	5.53%	7.85%	9.41%	10.40%
Xcel Energy Inc.	XEL	$1.95	$71.48	2.73%	2.82%	6.00%	7.07%	6.40%	6.49%	8.81%	9.31%	9.89%
Mean				3.39%	3.49%	6.18%	5.77%	5.55%	5.86%	8.20%	9.35%	10.58%
Median				3.50%	3.60%	6.00%	5.98%	6.10%	5.85%	8.11%	9.34%	10.38%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 30-day average as of June 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

90-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line EPS Growth	[6] Yahoo! Finance EPS Growth	[7] Zacks EPS Growth	[8] Average Growth Rate	[9] ROE - Minimum Growth Rate	[10] ROE - Average Growth Rate	[11] ROE - Maximum Growth Rate
ALLETE, Inc.	ALE	$2.60	$62.23	4.18%	4.34%	6.00%	8.70%	8.70%	7.80%	10.30%	12.14%	13.06%
Alliant Energy Corporation	LNT	$1.71	$60.23	2.84%	2.92%	6.00%	5.40%	5.70%	5.70%	8.32%	8.62%	8.92%
American Electric Power Company, Inc.	AEP	$3.12	$97.58	3.20%	3.30%	6.50%	6.21%	6.20%	6.30%	9.50%	9.60%	9.80%
Duke Energy Corporation	DUK	$3.94	$108.46	3.63%	3.74%	6.00%	5.91%	6.10%	6.00%	9.65%	9.75%	9.84%
Entergy Corporation	ETR	$4.04	$115.22	3.51%	3.60%	4.00%	6.04%	6.70%	5.58%	7.58%	9.18%	10.32%
Evergy, Inc.	EVRG	$2.29	$66.70	3.43%	3.54%	7.50%	4.95%	6.10%	6.18%	8.47%	9.72%	11.06%
IDACORP, Inc.	IDA	$3.00	$108.42	2.77%	2.81%	4.00%	2.80%	2.80%	3.20%	5.61%	6.01%	6.82%
NextEra Energy, Inc.	NEE	$1.70	$77.56	2.19%	2.30%	12.50%	9.02%	9.20%	10.24%	11.31%	12.54%	14.83%
NorthWestern Corporation	NWE	$2.52	$59.51	4.23%	4.30%	3.00%	4.50%	2.30%	3.27%	6.58%	7.57%	8.83%
OGE Energy Corporation	OGE	$1.64	$39.40	4.16%	4.25%	6.50%	1.90%	3.50%	3.97%	6.10%	8.21%	10.80%
Otter Tail Corporation	OTTR	$1.65	$63.10	2.61%	2.70%	4.50%	9.00%	n/a	6.75%	7.17%	9.45%	11.73%
Portland General Electric Company	POR	$1.81	$50.83	3.56%	3.65%	7.50%	3.23%	4.40%	5.04%	6.85%	8.69%	11.19%
Southern Company	SO	$2.72	$71.70	3.79%	3.90%	6.50%	6.10%	4.00%	5.53%	7.87%	9.43%	10.42%
Xcel Energy Inc.	XEL	$1.95	$71.68	2.72%	2.81%	6.00%	7.07%	6.40%	6.49%	8.80%	9.30%	9.89%
Mean				3.35%	3.44%	6.18%	5.77%	5.55%	5.86%	8.15%	9.30%	10.54%
Median				3.47%	3.57%	6.00%	5.98%	6.10%	5.85%	8.09%	9.37%	10.37%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 90-day average as of June 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

180-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line EPS Growth	[6] Yahoo! Finance EPS Growth	[7] Zacks EPS Growth	[8] Average Growth Rate	[9] ROE - Minimum Growth Rate	[10] ROE - Average Growth Rate	[11] ROE - Maximum Growth Rate
ALLETE, Inc.	ALE	$2.60	$62.82	4.14%	4.30%	6.00%	8.70%	8.70%	7.80%	10.26%	12.10%	13.02%
Alliant Energy Corporation	LNT	$1.71	$59.16	2.89%	2.97%	6.00%	5.40%	5.70%	5.70%	8.37%	8.67%	8.98%
American Electric Power Company, Inc.	AEP	$3.12	$91.91	3.39%	3.50%	6.50%	6.21%	6.20%	6.30%	9.70%	9.81%	10.01%
Duke Energy Corporation	DUK	$3.94	$105.24	3.74%	3.86%	6.00%	5.91%	6.10%	6.00%	9.76%	9.86%	9.96%
Entergy Corporation	ETR	$4.04	$111.04	3.64%	3.74%	4.00%	6.04%	6.70%	5.58%	7.71%	9.32%	10.46%
Evergy, Inc.	EVRG	$2.29	$65.92	3.47%	3.58%	7.50%	4.95%	6.10%	6.18%	8.51%	9.76%	11.10%
IDACORP, Inc.	IDA	$3.00	$107.98	2.78%	2.82%	4.00%	2.80%	2.80%	3.20%	5.62%	6.02%	6.83%
NextEra Energy, Inc.	NEE	$1.70	$81.02	2.10%	2.21%	12.50%	9.02%	9.20%	10.24%	11.21%	12.45%	14.73%
NorthWestern Corporation	NWE	$2.52	$58.27	4.32%	4.40%	3.00%	4.50%	2.30%	3.27%	6.67%	7.66%	8.92%
OGE Energy Corporation	OGE	$1.64	$37.73	4.35%	4.43%	6.50%	1.90%	3.50%	3.97%	6.29%	8.40%	10.99%
Otter Tail Corporation	OTTR	$1.65	$63.90	2.58%	2.67%	4.50%	9.00%	n/a	6.75%	7.14%	9.42%	11.70%
Portland General Electric Company	POR	$1.81	$50.85	3.56%	3.65%	7.50%	3.23%	4.40%	5.04%	6.85%	8.69%	11.19%
Southern Company	SO	$2.72	$68.52	3.97%	4.08%	6.50%	6.10%	4.00%	5.53%	8.05%	9.61%	10.60%
Xcel Energy Inc.	XEL	$1.95	$69.09	2.82%	2.91%	6.00%	7.07%	6.40%	6.49%	8.91%	9.40%	9.99%
Mean				3.41%	3.51%	6.18%	5.77%	5.55%	5.86%	8.22%	9.37%	10.61%
Median				3.52%	3.62%	6.00%	5.98%	6.10%	5.85%	8.21%	9.41%	10.53%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 180-day average as of June 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE & VL BETA

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

		[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)	ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.18%	0.90	12.94%	9.76%	11.96%	12.21%
Alliant Energy Corporation	LNT	3.18%	0.80	12.94%	9.76%	10.99%	11.48%
American Electric Power Company, Inc.	AEP	3.18%	0.75	12.94%	9.76%	10.50%	11.11%
Duke Energy Corporation	DUK	3.18%	0.85	12.94%	9.76%	11.48%	11.84%
Entergy Corporation	ETR	3.18%	0.90	12.94%	9.76%	11.96%	12.21%
Evergy, Inc.	EVRG	3.18%	0.90	12.94%	9.76%	11.96%	12.21%
IDACORP, Inc.	IDA	3.18%	0.80	12.94%	9.76%	10.99%	11.48%
NextEra Energy, Inc.	NEE	3.18%	0.90	12.94%	9.76%	11.96%	12.21%
NorthWestern Corporation	NWE	3.18%	0.95	12.94%	9.76%	12.45%	12.57%
OGE Energy Corporation	OGE	3.18%	1.00	12.94%	9.76%	12.94%	12.94%
Otter Tail Corporation	OTTR	3.18%	0.85	12.94%	9.76%	11.48%	11.84%
Portland General Electric Company	POR	3.18%	0.85	12.94%	9.76%	11.48%	11.84%
Southern Company	SO	3.18%	0.90	12.94%	9.76%	11.96%	12.21%
Xcel Energy Inc.	XEL	3.18%	0.80	12.94%	9.76%	10.99%	11.48%
Mean						11.65%	11.97%
Median						11.72%	12.03%

Notes:
[1] Source: Bloomberg Professional, as of June 30, 2022
[2] Source: Value Line
[3] Source: Schedule AEB-D2, Attachment 6
[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 & VL BETA

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

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q4 2022 - Q4 2023)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.74%	0.90	12.94%	9.20%	12.02%	12.25%
Alliant Energy Corporation	LNT	3.74%	0.80	12.94%	9.20%	11.10%	11.56%
American Electric Power Company, Inc.	AEP	3.74%	0.75	12.94%	9.20%	10.64%	11.22%
Duke Energy Corporation	DUK	3.74%	0.85	12.94%	9.20%	11.56%	11.91%
Entergy Corporation	ETR	3.74%	0.90	12.94%	9.20%	12.02%	12.25%
Evergy, Inc.	EVRG	3.74%	0.90	12.94%	9.20%	12.02%	12.25%
IDACORP, Inc.	IDA	3.74%	0.80	12.94%	9.20%	11.10%	11.56%
NextEra Energy, Inc.	NEE	3.74%	0.90	12.94%	9.20%	12.02%	12.25%
NorthWestern Corporation	NWE	3.74%	0.95	12.94%	9.20%	12.48%	12.60%
OGE Energy Corporation	OGE	3.74%	1.00	12.94%	9.20%	12.94%	12.94%
Otter Tail Corporation	OTTR	3.74%	0.85	12.94%	9.20%	11.56%	11.91%
Portland General Electric Company	POR	3.74%	0.85	12.94%	9.20%	11.56%	11.91%
Southern Company	SO	3.74%	0.90	12.94%	9.20%	12.02%	12.25%
Xcel Energy Inc.	XEL	3.74%	0.80	12.94%	9.20%	11.10%	11.56%
Mean						11.73%	12.03%
Median						11.79%	12.08%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 7, July 1, 2022, at 2
[2] Source: Value Line
[3] Source: Schedule AEB-D2, Attachment 6
[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 & VL BETA

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

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.80%	0.90	12.94%	9.14%	12.03%	12.26%
Alliant Energy Corporation	LNT	3.80%	0.80	12.94%	9.14%	11.11%	11.57%
American Electric Power Company, Inc.	AEP	3.80%	0.75	12.94%	9.14%	10.66%	11.23%
Duke Energy Corporation	DUK	3.80%	0.85	12.94%	9.14%	11.57%	11.91%
Entergy Corporation	ETR	3.80%	0.90	12.94%	9.14%	12.03%	12.26%
Evergy, Inc.	EVRG	3.80%	0.90	12.94%	9.14%	12.03%	12.26%
IDACORP, Inc.	IDA	3.80%	0.80	12.94%	9.14%	11.11%	11.57%
NextEra Energy, Inc.	NEE	3.80%	0.90	12.94%	9.14%	12.03%	12.26%
NorthWestern Corporation	NWE	3.80%	0.95	12.94%	9.14%	12.48%	12.60%
OGE Energy Corporation	OGE	3.80%	1.00	12.94%	9.14%	12.94%	12.94%
Otter Tail Corporation	OTTR	3.80%	0.85	12.94%	9.14%	11.57%	11.91%
Portland General Electric Company	POR	3.80%	0.85	12.94%	9.14%	11.57%	11.91%
Southern Company	SO	3.80%	0.90	12.94%	9.14%	12.03%	12.26%
Xcel Energy Inc.	XEL	3.80%	0.80	12.94%	9.14%	11.11%	11.57%
Mean						11.73%	12.03%
Median						11.80%	12.08%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14
[2] Source: Value Line
[3] Source: Schedule AEB-D2, Attachment 6
[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 & BLOOMBERG BETA

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

		[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)	ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.18%	0.82	12.94%	9.76%	11.17%	11.61%
Alliant Energy Corporation	LNT	3.18%	0.81	12.94%	9.76%	11.07%	11.54%
American Electric Power Company, Inc.	AEP	3.18%	0.78	12.94%	9.76%	10.76%	11.31%
Duke Energy Corporation	DUK	3.18%	0.73	12.94%	9.76%	10.31%	10.97%
Entergy Corporation	ETR	3.18%	0.87	12.94%	9.76%	11.71%	12.02%
Evergy, Inc.	EVRG	3.18%	0.81	12.94%	9.76%	11.09%	11.55%
IDACORP, Inc.	IDA	3.18%	0.82	12.94%	9.76%	11.19%	11.63%
NextEra Energy, Inc.	NEE	3.18%	0.82	12.94%	9.76%	11.14%	11.59%
NorthWestern Corporation	NWE	3.18%	0.90	12.94%	9.76%	11.93%	12.18%
OGE Energy Corporation	OGE	3.18%	0.94	12.94%	9.76%	12.34%	12.49%
Otter Tail Corporation	OTTR	3.18%	0.87	12.94%	9.76%	11.67%	11.99%
Portland General Electric Company	POR	3.18%	0.80	12.94%	9.76%	10.96%	11.46%
Southern Company	SO	3.18%	0.80	12.94%	9.76%	10.95%	11.45%
Xcel Energy Inc.	XEL	3.18%	0.75	12.94%	9.76%	10.52%	11.12%
Mean						11.20%	11.64%
Median						11.11%	11.57%

Notes:
[1] Source: Bloomberg Professional, as of June 30, 2022
[2] Source: Bloomberg Professional, based on 10-year weekly returns, as of June 30, 2022
[3] Source: Schedule AEB-D2, Attachment 6
[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 & BLOOMBERG BETA

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

Company	Ticker	[1] Near-term projected 30-year U.S. Treasury bond yield (Q4 2022 - Q4 2023)	[2] Beta (β)	[3] Market Return (Rm)	[4] Market Risk Premium (Rm − Rf)	[5] ROE (K)	[6] ECAPM ROE (K)
ALLETE, Inc.	ALE	3.74%	0.82	12.94%	9.20%	11.27%	11.69%
Alliant Energy Corporation	LNT	3.74%	0.81	12.94%	9.20%	11.17%	11.62%
American Electric Power Company, Inc.	AEP	3.74%	0.78	12.94%	9.20%	10.89%	11.40%
Duke Energy Corporation	DUK	3.74%	0.73	12.94%	9.20%	10.47%	11.08%
Entergy Corporation	ETR	3.74%	0.87	12.94%	9.20%	11.78%	12.07%
Evergy, Inc.	EVRG	3.74%	0.81	12.94%	9.20%	11.19%	11.63%
IDACORP, Inc.	IDA	3.74%	0.82	12.94%	9.20%	11.29%	11.70%
NextEra Energy, Inc.	NEE	3.74%	0.82	12.94%	9.20%	11.24%	11.67%
NorthWestern Corporation	NWE	3.74%	0.90	12.94%	9.20%	11.99%	12.23%
OGE Energy Corporation	OGE	3.74%	0.94	12.94%	9.20%	12.37%	12.51%
Otter Tail Corporation	OTTR	3.74%	0.87	12.94%	9.20%	11.74%	12.04%
Portland General Electric Company	POR	3.74%	0.80	12.94%	9.20%	11.07%	11.54%
Southern Company	SO	3.74%	0.80	12.94%	9.20%	11.07%	11.54%
Xcel Energy Inc.	XEL	3.74%	0.75	12.94%	9.20%	10.66%	11.23%
Mean						11.30%	11.71%
Median						11.22%	11.65%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 7, July 1, 2022, at 2
[2] Source: Bloomberg Professional, based on 10-year weekly returns, as of June 30, 2022
[3] Source: Schedule AEB-D2, Attachment 6
[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 & BLOOMBERG BETA

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

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.80%	0.82	12.94%	9.14%	11.28%	11.70%
Alliant Energy Corporation	LNT	3.80%	0.81	12.94%	9.14%	11.19%	11.62%
American Electric Power Company, Inc.	AEP	3.80%	0.78	12.94%	9.14%	10.90%	11.41%
Duke Energy Corporation	DUK	3.80%	0.73	12.94%	9.14%	10.48%	11.10%
Entergy Corporation	ETR	3.80%	0.87	12.94%	9.14%	11.79%	12.08%
Evergy, Inc.	EVRG	3.80%	0.81	12.94%	9.14%	11.20%	11.64%
IDACORP, Inc.	IDA	3.80%	0.82	12.94%	9.14%	11.30%	11.71%
NextEra Energy, Inc.	NEE	3.80%	0.82	12.94%	9.14%	11.25%	11.68%
NorthWestern Corporation	NWE	3.80%	0.90	12.94%	9.14%	12.00%	12.23%
OGE Energy Corporation	OGE	3.80%	0.94	12.94%	9.14%	12.38%	12.52%
Otter Tail Corporation	OTTR	3.80%	0.87	12.94%	9.14%	11.75%	12.05%
Portland General Electric Company	POR	3.80%	0.80	12.94%	9.14%	11.09%	11.55%
Southern Company	SO	3.80%	0.80	12.94%	9.14%	11.08%	11.55%
Xcel Energy Inc.	XEL	3.80%	0.75	12.94%	9.14%	10.67%	11.24%
Mean						11.31%	11.72%
Median						11.23%	11.66%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14
[2] Source: Bloomberg Professional, based on 10-year weekly returns, as of June 30, 2022
[3] Source: Schedule AEB-D2, Attachment 6
[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 & VALUE LINE LT AVERAGE BETA

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

		[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)	ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.18%	0.77	12.94%	9.76%	10.72%	11.27%
Alliant Energy Corporation	LNT	3.18%	0.74	12.94%	9.76%	10.39%	11.03%
American Electric Power Company, Inc.	AEP	3.18%	0.67	12.94%	9.76%	9.69%	10.50%
Duke Energy Corporation	DUK	3.18%	0.64	12.94%	9.76%	9.47%	10.34%
Entergy Corporation	ETR	3.18%	0.72	12.94%	9.76%	10.23%	10.91%
Evergy, Inc.	EVRG	3.18%	0.98	12.94%	9.76%	12.70%	12.76%
IDACORP, Inc.	IDA	3.18%	0.72	12.94%	9.76%	10.23%	10.91%
NextEra Energy, Inc.	NEE	3.18%	0.71	12.94%	9.76%	10.07%	10.78%
NorthWestern Corporation	NWE	3.18%	0.73	12.94%	9.76%	10.28%	10.95%
OGE Energy Corporation	OGE	3.18%	0.92	12.94%	9.76%	12.18%	12.37%
Otter Tail Corporation	OTTR	3.18%	0.85	12.94%	9.76%	11.48%	11.84%
Portland General Electric Company	POR	3.18%	0.74	12.94%	9.76%	10.39%	11.03%
Southern Company	SO	3.18%	0.63	12.94%	9.76%	9.31%	10.22%
Xcel Energy Inc.	XEL	3.18%	0.64	12.94%	9.76%	9.42%	10.30%
Mean						10.47%	11.09%
Median						10.26%	10.93%

Notes:
[1] Source: Bloomberg Professional, as of June 30, 2022
[2] Source: Schedule AEB-D2, Attachment 5
[3] Source: Schedule AEB-D2, Attachment 6
[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 & VALUE LINE LT AVERAGE BETA

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

Company	Ticker	[1] Near-term projected 30-year U.S. Treasury bond yield (Q4 2022 - Q4 2023)	[2] Beta (β)	[3] Market Return (Rm)	[4] Market Risk Premium (Rm − Rf)	[5] ROE (K)	[6] ECAPM ROE (K)
ALLETE, Inc.	ALE	3.74%	0.77	12.94%	9.20%	10.85%	11.37%
Alliant Energy Corporation	LNT	3.74%	0.74	12.94%	9.20%	10.54%	11.14%
American Electric Power Company, Inc.	AEP	3.74%	0.67	12.94%	9.20%	9.87%	10.64%
Duke Energy Corporation	DUK	3.74%	0.64	12.94%	9.20%	9.67%	10.49%
Entergy Corporation	ETR	3.74%	0.72	12.94%	9.20%	10.39%	11.02%
Evergy, Inc.	EVRG	3.74%	0.98	12.94%	9.20%	12.71%	12.77%
IDACORP, Inc.	IDA	3.74%	0.72	12.94%	9.20%	10.39%	11.02%
NextEra Energy, Inc.	NEE	3.74%	0.71	12.94%	9.20%	10.23%	10.91%
NorthWestern Corporation	NWE	3.74%	0.73	12.94%	9.20%	10.44%	11.06%
OGE Energy Corporation	OGE	3.74%	0.92	12.94%	9.20%	12.23%	12.40%
Otter Tail Corporation	OTTR	3.74%	0.85	12.94%	9.20%	11.56%	11.91%
Portland General Electric Company	POR	3.74%	0.74	12.94%	9.20%	10.54%	11.14%
Southern Company	SO	3.74%	0.63	12.94%	9.20%	9.52%	10.37%
Xcel Energy Inc.	XEL	3.74%	0.64	12.94%	9.20%	9.62%	10.45%
Mean						10.61%	11.19%
Median						10.41%	11.04%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 7, July 1, 2022, at 2
[2] Source: Schedule AEB-D2, Attachment 5
[3] Source: Schedule AEB-D2, Attachment 6
[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 & VALUE LINE LT BETA

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

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.80%	0.77	12.94%	9.14%	10.86%	11.38%
Alliant Energy Corporation	LNT	3.80%	0.74	12.94%	9.14%	10.55%	11.15%
American Electric Power Company, Inc.	AEP	3.80%	0.67	12.94%	9.14%	9.89%	10.66%
Duke Energy Corporation	DUK	3.80%	0.64	12.94%	9.14%	9.69%	10.50%
Entergy Corporation	ETR	3.80%	0.72	12.94%	9.14%	10.40%	11.04%
Evergy, Inc.	EVRG	3.80%	0.98	12.94%	9.14%	12.71%	12.77%
IDACORP, Inc.	IDA	3.80%	0.72	12.94%	9.14%	10.40%	11.04%
NextEra Energy, Inc.	NEE	3.80%	0.71	12.94%	9.14%	10.25%	10.92%
NorthWestern Corporation	NWE	3.80%	0.73	12.94%	9.14%	10.45%	11.07%
OGE Energy Corporation	OGE	3.80%	0.92	12.94%	9.14%	12.23%	12.41%
Otter Tail Corporation	OTTR	3.80%	0.85	12.94%	9.14%	11.57%	11.91%
Portland General Electric Company	POR	3.80%	0.74	12.94%	9.14%	10.55%	11.15%
Southern Company	SO	3.80%	0.63	12.94%	9.14%	9.54%	10.39%
Xcel Energy Inc.	XEL	3.80%	0.64	12.94%	9.14%	9.64%	10.47%
Mean						10.62%	11.20%
Median						10.43%	11.06%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14
[2] Source: Schedule AEB-D2, Attachment 5
[3] Source: Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

HISTORICAL BETA - 2013 - 2021

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] Average
ALLETE, Inc.	ALE	0.75	0.80	0.80	0.75	0.80	0.65	0.65	0.85	0.90	0.77
Alliant Energy Corporation	LNT	0.75	0.80	0.80	0.70	0.70	0.60	0.60	0.85	0.85	0.74
American Electric Power Company, Inc.	AEP	0.70	0.70	0.70	0.65	0.65	0.55	0.55	0.75	0.75	0.67
Duke Energy Corporation	DUK	0.65	0.60	0.65	0.60	0.60	0.50	0.50	0.85	0.85	0.64
Entergy Corporation	ETR	0.70	0.70	0.70	0.65	0.65	0.60	0.60	0.95	0.95	0.72
Evergy, Inc.	EVRG						NMF	NMF	1.00	0.95	0.98
IDACORP, Inc.	IDA	0.75	0.80	0.80	0.75	0.70	0.55	0.55	0.80	0.80	0.72
NextEra Energy, Inc.	NEE	0.70	0.70	0.75	0.65	0.65	0.55	0.55	0.90	0.90	0.71
NorthWestern Corporation	NWE	0.70	0.70	0.70	0.70	0.70	0.60	0.60	0.90	0.95	0.73
OGE Energy Corporation	OGE	0.85	0.90	0.95	0.90	0.95	0.85	0.75	1.10	1.05	0.92
Otter Tail Corporation	OTTR	0.95	0.90	0.85	0.85	0.90	0.75	0.70	0.85	0.90	0.85
Portland General Electric Company	POR	0.75	0.80	0.80	0.70	0.70	0.60	0.55	0.85	0.90	0.74
Southern Company	SO	0.55	0.55	0.60	0.55	0.55	0.50	0.50	0.90	0.95	0.63
Xcel Energy Inc.	XEL	0.65	0.65	0.65	0.60	0.60	0.50	0.50	0.80	0.80	0.64
Mean		0.73	0.74	0.75	0.70	0.70	0.60	0.58	0.88	0.89	0.75

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

MARKET RISK PREMIUM DERIVED FROM ANALYSTS' LONG-TERM GROWTH ESTIMATES

[1] Estimated Weighted Average Dividend Yield	1.83%
[2] Estimated Weighted Average Long-Term Growth Rate	11.02%
[3] S&P 500 Estimated Required Market Return	12.94%

STANDARD AND POOR'S 500 INDEX

		[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Name	Ticker	Shares Outst'g	Price	Market Capitalization	Weight in Index	Estimated Dividend Yield	Cap-Weighted Dividend Yield	Value Line Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	327.62	87.46	28,654	0.11%	5.44%	0.01%	3.50%	0.00%
Signature Bank/New York NY	SBNY	63.07	179.21	11,302		1.25%		24.50%	
American Express Co	AXP	753.06	138.62	104,389	0.39%	1.50%	0.01%	10.00%	0.04%
Verizon Communications Inc	VZ	4,199.64	50.75	213,132	0.80%	5.04%	0.04%	3.00%	0.02%
Broadcom Inc	AVGO	403.82	485.81	196,179		3.38%		23.00%	
Boeing Co/The	BA	591.64	136.72	80,888					
Caterpillar Inc	CAT	533.37	178.76	95,346	0.36%	2.69%	0.01%	8.00%	0.03%
JPMorgan Chase & Co	JPM	2,937.05	112.61	330,741	1.24%	3.55%	0.04%	5.00%	0.06%
Chevron Corp	CVX	1,964.81	144.78	284,466		3.92%		26.00%	
Coca-Cola Co/The	KO	4,335.03	62.91	272,717	1.02%	2.80%	0.03%	7.00%	0.07%
AbbVie Inc	ABBV	1,767.11	153.16	270,651	1.02%	3.68%	0.04%	4.50%	0.05%
Walt Disney Co/The	DIS	1,821.48	94.40	171,948				30.50%	
FleetCor Technologies Inc	FLT	77.34	210.11	16,250	0.06%			10.50%	0.01%
Extra Space Storage Inc	EXR	134.28	170.12	22,844	0.09%	3.53%	0.00%	4.00%	0.00%
Exxon Mobil Corp	XOM	4,212.54	85.64	360,762		4.11%			
Phillips 66	PSX	481.10	81.99	39,445		4.73%		85.00%	
General Electric Co	GE	1,100.67	63.67	70,079	0.26%	0.50%	0.00%	15.00%	0.04%
HP Inc	HPQ	1,034.14	32.78	33,899	0.13%	3.05%	0.00%	12.50%	0.02%
Home Depot Inc/The	HD	1,027.76	274.27	281,882	1.06%	2.77%	0.03%	9.00%	0.10%
Monolithic Power Systems Inc	MPWR	46.64	384.04	17,913	0.07%	0.78%	0.00%	18.00%	0.01%
International Business Machines Corp	IBM	899.44	141.19	126,991	0.48%	4.67%	0.02%	3.00%	0.01%
Johnson & Johnson	JNJ	2,631.40	177.51	467,100	1.75%	2.55%	0.04%	8.00%	0.14%
McDonald's Corp	MCD	739.55	246.88	182,579	0.68%	2.24%	0.02%	10.50%	0.07%
Merck & Co Inc	MRK	2,528.81	91.17	230,551	0.86%	3.03%	0.03%	8.00%	0.07%
3M Co	MMM	569.06	129.41	73,642	0.28%	4.61%	0.01%	5.50%	0.02%
American Water Works Co Inc	AWK	181.75	148.77	27,039	0.10%	1.76%	0.00%	8.50%	0.01%
Bank of America Corp	BAC	8,056.88	31.13	250,811	0.94%	2.70%	0.03%	9.00%	0.08%
Pfizer Inc	PFE	5,610.90	52.43	294,179	1.10%	3.05%	0.03%	6.50%	0.07%
Procter & Gamble Co/The	PG	2,399.30	143.79	344,995	1.29%	2.54%	0.03%	6.50%	0.08%
AT&T Inc	T	7,159.00	20.96	150,053	0.56%	5.30%	0.03%	0.50%	0.00%
Travelers Cos Inc/The	TRV	239.96	169.13	40,585	0.15%	2.20%	0.00%	8.00%	0.01%
Raytheon Technologies Corp	RTX	1,487.22	96.11	142,936	0.54%	2.29%	0.01%	7.50%	0.04%
Analog Devices Inc	ADI	519.81	146.09	75,938	0.28%	2.08%	0.01%	14.00%	0.04%
Walmart Inc	WMT	2,741.15	121.58	333,269	1.25%	1.84%	0.02%	7.50%	0.09%
Cisco Systems Inc	CSCO	4,140.96	42.64	176,571	0.66%	3.56%	0.02%	8.00%	0.05%
Intel Corp	INTC	4,089.00	37.41	152,969	0.57%	3.90%	0.02%	6.00%	0.03%
General Motors Co	GM	1,458.02	31.76	46,307	0.17%			11.00%	0.02%
Microsoft Corp	MSFT	7,479.03	256.83	1,920,840	7.20%	0.97%	0.07%	17.50%	1.26%
Dollar General Corp	DG	227.00	245.44	55,714	0.21%	0.90%	0.00%	10.00%	0.02%
Cigna Corp	CI	317.27	263.52	83,608	0.31%	1.70%	0.01%	10.00%	0.03%
Kinder Morgan Inc	KMI	2,267.47	16.76	38,003	0.14%	6.62%	0.01%	19.00%	0.03%
Citigroup Inc	C	1,941.92	45.99	89,309	0.33%	4.44%	0.01%	4.50%	0.02%
American International Group Inc	AIG	792.19	51.13	40,505		2.50%		31.50%	
Altria Group Inc	MO	1,810.56	41.77	75,627	0.28%	8.62%	0.02%	5.50%	0.02%
HCA Healthcare Inc	HCA	295.48	168.06	49,659	0.19%	1.33%	0.00%	12.50%	0.02%
International Paper Co	IP	370.63	41.83	15,503	0.06%	4.42%	0.00%	12.50%	0.01%
Hewlett Packard Enterprise Co	HPE	1,299.33	13.26	17,229	0.06%	3.62%	0.00%	7.50%	0.00%
Abbott Laboratories	ABT	1,750.94	108.65	190,240	0.71%	1.73%	0.01%	8.00%	0.06%
Aflac Inc	AFL	644.17	55.33	35,642	0.13%	2.89%	0.00%	9.00%	0.01%
Air Products and Chemicals Inc	APD	221.77	240.48	53,332	0.20%	2.69%	0.01%	12.00%	0.02%
Royal Caribbean Cruises Ltd	RCL	254.96	34.91	8,901					
Hess Corp	HES	311.26	105.94	32,975		1.42%			
Archer-Daniels-Midland Co	ADM	562.71	77.60	43,666	0.16%	2.06%	0.00%	13.00%	0.02%
Automatic Data Processing Inc	ADP	417.75	210.04	87,744	0.33%	1.98%	0.01%	9.00%	0.03%
Verisk Analytics Inc	VRSK	157.90	173.09	27,331	0.10%	0.72%	0.00%	10.50%	0.01%
AutoZone Inc	AZO	19.49	2,149.12	41,882	0.16%			14.00%	0.02%
Avery Dennison Corp	AVY	81.71	161.87	13,227	0.05%	1.85%	0.00%	12.00%	0.01%
Enphase Energy Inc	ENPH	135.03	195.24	26,363				26.50%	
MSCI Inc	MSCI	81.27	412.15	33,495	0.13%	1.01%	0.00%	14.50%	0.02%
Ball Corp	BALL	319.79	68.77	21,992		1.16%		21.50%	
Ceridian HCM Holding Inc	CDAY	152.65	47.08	7,187					
Carrier Global Corp	CARR	848.24	35.66	30,248		1.68%			
Bank of New York Mellon Corp/The	BK	807.80	41.71	33,693	0.13%	3.26%	0.00%	6.50%	0.01%
Otis Worldwide Corp	OTIS	422.79	70.67	29,879		1.64%			
Baxter International Inc	BAX	503.53	64.23	32,342	0.12%	1.81%	0.00%	10.00%	0.01%
Becton Dickinson and Co	BDX	285.07	246.53	70,277	0.26%	1.41%	0.00%	5.50%	0.01%
Berkshire Hathaway Inc	BRK/B	1,285.75	273.02	351,036	1.32%			6.00%	0.08%
Best Buy Co Inc	BBY	225.17	65.19	14,679	0.06%	5.40%	0.00%	9.50%	0.01%
Boston Scientific Corp	BSX	1,429.57	37.27	53,280	0.20%			16.00%	0.03%
Bristol-Myers Squibb Co	BMY	2,129.06	77.00	163,938		2.81%			
Fortune Brands Home & Security Inc	FBHS	130.81	59.88	7,833	0.03%	1.87%	0.00%	10.00%	0.00%
Brown-Forman Corp	BF/B	309.90	70.16	21,743	0.08%	1.07%	0.00%	12.00%	0.01%
Coterra Energy Inc	CTRA	805.81	25.79	20,782		2.33%			
Campbell Soup Co	CPB	300.58	48.05	14,443	0.05%	3.08%	0.00%	5.00%	0.00%
Hilton Worldwide Holdings Inc	HLT	278.33	111.44	31,017		0.54%			
Carnival Corp	CCL	994.62	8.65	8,603					
Qorvo Inc	QRVO	103.73	94.32	9,784	0.04%			14.50%	0.01%
Lumen Technologies Inc	LUMN	1,033.06	10.91	11,271	0.04%	9.17%	0.00%	3.50%	0.00%
UDR Inc	UDR	318.40	46.04	14,659	0.05%	3.30%	0.00%	10.50%	0.01%
Clorox Co/The	CLX	123.08	140.98	17,352	0.07%	3.29%	0.00%	4.50%	0.00%

STANDARD AND POOR'S 500 INDEX

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] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Paycom Software Inc	PAYC	60.25	280.12	16,878	0.06%			20.00%	0.01%
CMS Energy Corp	CMS	290.13	67.50	19,584	0.07%	2.73%	0.00%	6.50%	0.00%
Newell Brands Inc	NWL	413.50	19.04	7,873		4.83%			
Colgate-Palmolive Co	CL	837.94	80.14	67,153	0.25%	2.35%	0.01%	6.50%	0.02%
EPAM Systems Inc	EPAM	57.15	294.78	16,847				20.50%	
Comerica Inc	CMA	130.76	73.38	9,595	0.04%	3.71%	0.00%	6.00%	0.00%
Conagra Brands Inc	CAG	479.88	34.24	16,431	0.06%	3.65%	0.00%	4.00%	0.00%
Consolidated Edison Inc	ED	354.30	95.10	33,693	0.13%	3.32%	0.00%	4.50%	0.01%
Corning Inc	GLW	844.61	31.51	26,614	0.10%	3.43%	0.00%	17.50%	0.02%
Cummins Inc	CMI	141.10	193.53	27,307	0.10%	3.00%	0.00%	8.00%	0.01%
Caesars Entertainment Inc	CZR	214.37	38.30	8,210					
Danaher Corp	DHR	727.08	253.52	184,329	0.69%	0.39%	0.00%	17.00%	0.12%
Target Corp	TGT	463.70	141.23	65,488	0.25%	3.06%	0.01%	13.00%	0.03%
Deere & Co	DE	305.64	299.47	91,529	0.34%	1.51%	0.01%	15.00%	0.05%
Dominion Energy Inc	D	811.27	79.81	64,747	0.24%	3.35%	0.01%	14.00%	0.03%
Dover Corp	DOV	144.16	121.32	17,490	0.07%	1.65%	0.00%	9.00%	0.01%
Alliant Energy Corp	LNT	250.81	58.61	14,700	0.06%	2.92%	0.00%	6.00%	0.00%
Duke Energy Corp	DUK	770.00	107.21	82,552	0.31%	3.68%	0.01%	6.00%	0.02%
Regency Centers Corp	REG	172.36	59.31	10,223	0.04%	4.22%	0.00%	12.50%	0.00%
Eaton Corp PLC	ETN	399.00	125.99	50,270	0.19%	2.57%	0.00%	12.00%	0.02%
Ecolab Inc	ECL	285.66	153.76	43,922	0.16%	1.33%	0.00%	10.50%	0.02%
PerkinElmer Inc	PKI	126.15	142.22	17,941	0.07%	0.20%	0.00%	5.00%	0.00%
Emerson Electric Co	EMR	594.00	79.54	47,247	0.18%	2.59%	0.00%	10.00%	0.02%
EOG Resources Inc	EOG	585.71	110.44	64,686	0.24%	2.72%	0.01%	18.00%	0.04%
Aon PLC	AON	212.38	269.68	57,276	0.21%	0.83%	0.00%	7.50%	0.02%
Entergy Corp	ETR	203.37	112.64	22,908	0.09%	3.59%	0.00%	4.00%	0.00%
Equifax Inc	EFX	122.34	182.78	22,360	0.08%	0.85%	0.00%	10.00%	0.01%
IQVIA Holdings Inc	IQV	189.28	216.99	41,072	0.15%			14.50%	0.02%
Gartner Inc	IT	80.54	241.83	19,477	0.07%			15.50%	0.01%
FedEx Corp	FDX	259.18	226.71	58,758	0.22%	2.03%	0.00%	13.00%	0.03%
FMC Corp	FMC	125.94	107.01	13,477	0.05%	1.98%	0.00%	11.00%	0.01%
Brown & Brown Inc	BRO	282.27	58.34	16,468	0.06%	0.70%	0.00%	10.50%	0.01%
Ford Motor Co	F	3,948.91	11.13	43,951		3.59%		33.50%	
NextEra Energy Inc	NEE	1,964.50	77.46	152,170	0.57%	2.19%	0.01%	12.50%	0.07%
Franklin Resources Inc	BEN	499.92	23.31	11,653	0.04%	4.98%	0.00%	9.00%	0.00%
Garmin Ltd	GRMN	193.13	98.25	18,975	0.07%	2.97%	0.00%	8.00%	0.01%
Freeport-McMoRan Inc	FCX	1,449.26	29.26	42,405		2.05%		29.00%	
Dexcom Inc	DXCM	392.50	74.53	29,253					
General Dynamics Corp	GD	277.71	221.25	61,442	0.23%	2.28%	0.01%	8.00%	0.02%
General Mills Inc	GIS	597.16	75.45	45,056	0.17%	2.86%	0.00%	4.00%	0.01%
Genuine Parts Co	GPC	141.60	133.00	18,832	0.07%	2.69%	0.00%	8.50%	0.01%
Atmos Energy Corp	ATO	139.02	112.10	15,584	0.06%	2.43%	0.00%	7.50%	0.00%
WW Grainger Inc	GWW	51.10	454.43	23,222	0.09%	1.51%	0.00%	7.00%	0.01%
Halliburton Co	HAL	901.98	31.36	28,286		1.53%		26.00%	
L3Harris Technologies Inc	LHX	192.88	241.70	46,618	0.17%	1.85%	0.00%	18.50%	0.03%
Healthpeak Properties Inc	PEAK	539.56	25.91	13,980	0.05%	4.63%	0.00%	17.00%	0.01%
Catalent Inc	CTLT	179.21	107.29	19,228				21.00%	
Fortive Corp	FTV	358.45	54.38	19,492	0.07%	0.51%	0.00%	12.00%	0.01%
Hershey Co/The	HSY	145.99	215.16	31,411	0.12%	1.68%	0.00%	6.50%	0.01%
Synchrony Financial	SYF	501.49	27.62	13,851	0.05%	3.19%	0.00%	9.50%	0.00%
Hormel Foods Corp	HRL	546.06	47.36	25,861	0.10%	2.20%	0.00%	6.50%	0.01%
Arthur J Gallagher & Co	AJG	210.07	163.04	34,249	0.13%	1.25%	0.00%	16.50%	0.02%
Mondelez International Inc	MDLZ	1,383.92	62.09	85,928	0.32%	2.25%	0.01%	9.50%	0.03%
CenterPoint Energy Inc	CNP	629.43	29.58	18,619	0.07%	2.30%	0.00%	6.50%	0.00%
Humana Inc	HUM	126.49	468.07	59,208	0.22%	0.67%	0.00%	11.00%	0.02%
Willis Towers Watson PLC	WTW	111.49	197.39	22,007	0.08%	1.66%	0.00%	8.00%	0.01%
Illinois Tool Works Inc	ITW	311.44	182.25	56,760	0.21%	2.68%	0.01%	11.00%	0.02%
CDW Corp/DE	CDW	135.12	157.56	21,289	0.08%	1.27%	0.00%	11.00%	0.01%
Trane Technologies PLC	TT	233.86	129.87	30,371		2.06%			
Interpublic Group of Cos Inc/The	IPG	393.66	27.53	10,838	0.04%	4.21%	0.00%	12.00%	0.00%
International Flavors & Fragrances Inc	IFF	254.84	119.12	30,356	0.11%	2.65%	0.00%	7.50%	0.01%
Jacobs Engineering Group Inc	J	128.63	127.13	16,352	0.06%	0.72%	0.00%	15.00%	0.01%
Generac Holdings Inc	GNRC	63.63	210.58	13,441				23.50%	
NXP Semiconductors NV	NXPI	262.57	148.03	38,867	0.15%	2.28%	0.00%	12.00%	0.02%
Kellogg Co	K	337.87	71.34	24,104	0.09%	3.25%	0.00%	3.50%	0.00%
Broadridge Financial Solutions Inc	BR	117.23	142.55	16,711	0.06%	1.80%	0.00%	9.00%	0.01%
Kimberly-Clark Corp	KMB	336.93	135.15	45,535	0.17%	3.43%	0.01%	5.50%	0.01%
Kimco Realty Corp	KIM	618.01	19.77	12,218	0.05%	4.05%	0.00%	8.50%	0.00%
Oracle Corp	ORCL	2,664.93	69.87	186,198	0.70%	1.83%	0.01%	9.00%	0.06%
Kroger Co/The	KR	715.56	47.33	33,867	0.13%	2.20%	0.00%	6.50%	0.01%
Lennar Corp	LEN	258.62	70.57	18,251	0.07%	2.13%	0.00%	9.00%	0.01%
Eli Lilly & Co	LLY	950.16	324.23	308,070	1.16%	1.21%	0.01%	11.50%	0.13%
Bath & Body Works Inc	BBWI	228.74	26.92	6,158		2.97%		26.50%	
Charter Communications Inc	CHTR	160.73	468.53	75,305				21.50%	
Lincoln National Corp	LNC	171.95	46.77	8,042	0.03%	3.85%	0.00%	11.50%	0.00%
Loews Corp	L	246.11	59.26	14,584	0.05%	0.42%	0.00%	16.00%	0.01%
Lowe's Cos Inc	LOW	639.13	174.67	111,637	0.42%	2.40%	0.01%	12.50%	0.05%
IDEX Corp	IEX	76.01	181.63	13,805	0.05%	1.32%	0.00%	10.00%	0.01%
Marsh & McLennan Cos Inc	MMC	502.71	155.25	78,045	0.29%	1.38%	0.00%	11.50%	0.03%
Masco Corp	MAS	235.94	50.60	11,939	0.04%	2.21%	0.00%	8.50%	0.00%
S&P Global Inc	SPGI	339.90	337.06	114,567	0.43%	1.01%	0.00%	9.50%	0.04%
Medtronic PLC	MDT	1,328.71	89.75	119,252	0.45%	3.03%	0.01%	8.50%	0.04%
Viatris Inc	VTRS	1,212.33	10.47	12,693		4.58%			
CVS Health Corp	CVS	1,311.31	92.66	121,506	0.46%	2.37%	0.01%	6.00%	0.03%
DuPont de Nemours Inc	DD	508.53	55.58	28,264	0.11%	2.37%	0.00%	10.00%	0.01%
Micron Technology Inc	MU	1,116.67	55.28	61,729		0.83%		24.00%	
Motorola Solutions Inc	MSI	167.30	209.60	35,065	0.13%	1.51%	0.00%	8.00%	0.01%
Cboe Global Markets Inc	CBOE	106.19	113.19	12,020	0.05%	1.70%	0.00%	10.00%	0.00%
Laboratory Corp of America Holdings	LH	93.18	234.36	21,837	0.08%	1.23%	0.00%	6.00%	0.00%
Newmont Corp	NEM	793.65	59.67	47,357	0.18%	3.69%	0.01%	9.50%	0.02%
NIKE Inc	NKE	1,268.76	102.20	129,667		1.19%		24.00%	

STANDARD AND POOR'S 500 INDEX

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NiSource Inc	NI	405.80	29.49	11,967	0.04%	3.19%	0.00%	9.50%	0.00%
Norfolk Southern Corp	NSC	238.33	227.29	54,171	0.20%	2.18%	0.00%	10.00%	0.02%
Principal Financial Group Inc	PFG	252.68	66.79	16,877	0.06%	3.83%	0.00%	6.00%	0.00%
Eversource Energy	ES	344.88	84.47	29,132	0.11%	3.02%	0.00%	6.00%	0.01%
Northrop Grumman Corp	NOC	155.45	478.57	74,391	0.28%	1.45%	0.00%	7.50%	0.02%
Wells Fargo & Co	WFC	3,790.35	39.17	148,468	0.56%	2.55%	0.01%	7.50%	0.04%
Nucor Corp	NUE	266.00	104.41	27,773	0.10%	1.92%	0.00%	10.00%	0.01%
PVH Corp	PVH	66.96	56.90	3,810	0.01%	0.26%	0.00%	13.50%	0.00%
Occidental Petroleum Corp	OXY	937.19	58.88	55,182		0.88%			
Omnicom Group Inc	OMC	205.73	63.61	13,087	0.05%	4.40%	0.00%	6.00%	0.00%
ONEOK Inc	OKE	446.62	55.50	24,787	0.09%	5.74%	0.01%	11.00%	0.01%
Raymond James Financial Inc	RJF	216.66	89.41	19,371	0.07%	1.52%	0.00%	10.50%	0.01%
Parker-Hannifin Corp	PH	128.37	246.05	31,586	0.12%	2.16%	0.00%	12.50%	0.01%
Rollins Inc	ROL	492.46	34.92	17,197	0.06%	1.15%	0.00%	10.50%	0.01%
PPL Corp	PPL	735.90	27.13	19,965		3.32%			
ConocoPhillips	COP	1,293.45	89.81	116,165	0.44%	2.05%	0.01%	20.00%	0.09%
PulteGroup Inc	PHM	237.63	39.63	9,417	0.04%	1.51%	0.00%	11.00%	0.00%
Pinnacle West Capital Corp	PNW	113.00	73.12	8,263	0.03%	4.65%	0.00%	1.50%	0.00%
PNC Financial Services Group Inc/The	PNC	413.58	157.77	65,251	0.24%	3.80%	0.01%	11.50%	0.03%
PPG Industries Inc	PPG	236.15	114.34	27,001	0.10%	2.06%	0.00%	4.00%	0.00%
Progressive Corp/The	PGR	584.90	116.27	68,006	0.26%	0.34%	0.00%	4.50%	0.01%
Public Service Enterprise Group Inc	PEG	499.26	63.28	31,593	0.12%	3.41%	0.00%	4.00%	0.00%
Robert Half International Inc	RHI	110.51	74.89	8,276	0.03%	2.30%	0.00%	7.50%	0.00%
Edison International	EIX	381.20	63.24	24,107		4.43%			
Schlumberger NV	SLB	1,413.46	35.76	50,545		1.96%		23.00%	
Charles Schwab Corp/The	SCHW	1,817.06	63.18	114,802	0.43%	1.27%	0.01%	9.00%	0.04%
Sherwin-Williams Co/The	SHW	260.13	223.91	58,246	0.22%	1.07%	0.00%	11.50%	0.03%
West Pharmaceutical Services Inc	WST	74.08	302.37	22,398	0.08%	0.24%	0.00%	17.00%	0.01%
J M Smucker Co/The	SJM	106.56	128.01	13,640	0.05%	3.09%	0.00%	4.00%	0.00%
Snap-on Inc	SNA	53.37	197.03	10,516	0.04%	2.88%	0.00%	4.50%	0.00%
AMETEK Inc	AME	230.91	109.89	25,375	0.10%	0.80%	0.00%	10.00%	0.01%
Southern Co/The	SO	1,062.53	71.31	75,769	0.28%	3.81%	0.01%	6.50%	0.02%
Truist Financial Corp	TFC	1,331.41	47.43	63,149	0.24%	4.05%	0.01%	7.00%	0.02%
Southwest Airlines Co	LUV	592.96	36.12	21,418				29.50%	
W R Berkley Corp	WRB	265.19	68.26	18,102	0.07%	0.59%	0.00%	15.50%	0.01%
Stanley Black & Decker Inc	SWK	150.97	104.86	15,830	0.06%	3.01%	0.00%	6.00%	0.00%
Public Storage	PSA	175.53	312.67	54,883	0.21%	2.56%	0.01%	8.00%	0.02%
Arista Networks Inc	ANET	308.26	93.74	28,897	0.11%			4.50%	0.00%
Sysco Corp	SYY	509.48	84.71	43,158	0.16%	2.31%	0.00%	17.50%	0.03%
Corteva Inc	CTVA	725.32	54.14	39,269	0.15%	1.03%	0.00%	16.50%	0.02%
Texas Instruments Inc	TXN	922.13	153.65	141,686	0.53%	2.99%	0.02%	9.00%	0.05%
Textron Inc	TXT	215.08	61.07	13,135	0.05%	0.13%	0.00%	8.50%	0.00%
Thermo Fisher Scientific Inc	TMO	391.46	543.28	212,673	0.80%	0.22%	0.00%	15.50%	0.12%
TJX Cos Inc/The	TJX	1,171.64	55.85	65,436	0.25%	2.11%	0.01%	20.00%	0.05%
Globe Life Inc	GL	98.60	97.47	9,611	0.04%	0.85%	0.00%	8.00%	0.00%
Johnson Controls International plc	JCI	695.67	47.88	33,309	0.12%	2.92%	0.00%	14.00%	0.02%
Ulta Beauty Inc	ULTA	51.82	385.48	19,975	0.07%			15.00%	0.01%
Union Pacific Corp	UNP	628.03	213.28	133,945	0.50%	2.44%	0.01%	9.50%	0.05%
Keysight Technologies Inc	KEYS	179.95	137.85	24,806	0.09%			13.00%	0.01%
UnitedHealth Group Inc	UNH	938.17	513.63	481,873	1.81%	1.28%	0.02%	12.00%	0.22%
Marathon Oil Corp	MRO	707.69	22.48	15,909		1.42%			
Bio-Rad Laboratories Inc	BIO	24.88	495.00	12,314	0.05%			11.50%	0.01%
Ventas Inc	VTR	399.70	51.43	20,556	0.08%	3.50%	0.00%	10.50%	0.01%
VF Corp	VFC	388.48	44.17	17,159	0.06%	4.53%	0.00%	9.50%	0.01%
Vornado Realty Trust	VNO	191.74	28.59	5,482		7.42%		-20.50%	
Vulcan Materials Co	VMC	132.90	142.10	18,885	0.07%	1.13%	0.00%	8.50%	0.01%
Weyerhaeuser Co	WY	744.50	33.12	24,658	0.09%	2.17%	0.00%	6.00%	0.01%
Whirlpool Corp	WHR	56.20	154.87	8,704	0.03%	4.52%	0.00%	9.50%	0.00%
Williams Cos Inc/The	WMB	1,218.01	31.21	38,014	0.14%	5.45%	0.01%	8.50%	0.01%
Constellation Energy Corp	CEG	326.66	57.26	18,705		0.98%			
WEC Energy Group Inc	WEC	315.44	100.64	31,745	0.12%	2.89%	0.00%	6.00%	0.01%
Adobe Inc	ADBE	468.00	366.06	171,316	0.64%			14.50%	0.09%
AES Corp/The	AES	667.86	21.01	14,032	0.05%	3.01%	0.00%	14.00%	0.01%
Amgen Inc	AMGN	534.20	243.30	129,971	0.49%	3.19%	0.02%	5.50%	0.03%
Apple Inc	AAPL	16,185.18	136.72	2,212,838	8.30%	0.67%	0.06%	14.00%	1.16%
Autodesk Inc	ADSK	217.27	171.96	37,362	0.14%			14.00%	0.02%
Cintas Corp	CTAS	102.33	373.53	38,221	0.14%	1.02%	0.00%	13.50%	0.02%
Comcast Corp	CMCSA	4,470.57	39.24	175,425	0.66%	2.75%	0.02%	9.50%	0.06%
Molson Coors Beverage Co	TAP	200.53	54.51	10,931		2.79%		49.50%	
KLA Corp	KLAC	149.24	319.08	47,618		1.32%		21.00%	
Marriott International Inc/MD	MAR	327.30	136.01	44,516	0.17%	0.88%	0.00%	17.50%	0.03%
McCormick & Co Inc/MD	MKC	250.47	83.25	20,852	0.08%	1.78%	0.00%	6.00%	0.00%
PACCAR Inc	PCAR	347.68	82.34	28,628	0.11%	1.65%	0.00%	5.00%	0.01%
Costco Wholesale Corp	COST	442.96	479.28	212,303	0.80%	0.75%	0.01%	10.50%	0.08%
First Republic Bank/CA	FRC	179.68	144.20	25,910	0.10%	0.75%	0.00%	11.00%	0.01%
Stryker Corp	SYK	378.15	198.93	75,226	0.28%	1.40%	0.00%	8.50%	0.02%
Tyson Foods Inc	TSN	291.54	86.06	25,090	0.09%	2.14%	0.00%	6.00%	0.01%
Lamb Weston Holdings Inc	LW	144.45	71.46	10,322	0.04%	1.37%	0.00%	5.00%	0.00%
Applied Materials Inc	AMAT	869.95	90.98	79,148	0.30%	1.14%	0.00%	14.50%	0.04%
American Airlines Group Inc	AAL	649.52	12.68	8,236					
Cardinal Health Inc	CAH	272.43	52.27	14,240	0.05%	3.79%	0.00%	5.00%	0.00%
Cincinnati Financial Corp	CINF	160.36	118.98	19,079	0.07%	2.32%	0.00%	7.00%	0.01%
Paramount Global	PARA	608.40	24.68	15,015	0.06%	3.89%	0.00%	4.50%	0.00%
DR Horton Inc	DHI	352.03	66.19	23,301	0.09%	1.36%	0.00%	13.00%	0.01%
Electronic Arts Inc	EA	279.31	121.65	33,978	0.13%	0.62%	0.00%	9.00%	0.01%
Expeditors International of Washington Inc	EXPD	167.75	97.46	16,349	0.06%	1.37%	0.00%	10.00%	0.01%
Fastenal Co	FAST	575.55	49.92	28,732	0.11%	2.48%	0.00%	8.50%	0.01%
M&T Bank Corp	MTB	179.42	159.39	28,597	0.11%	3.01%	0.00%	8.00%	0.01%
Xcel Energy Inc	XEL	544.65	70.76	38,540	0.14%	2.76%	0.00%	6.00%	0.01%
Fiserv Inc	FISV	646.39	88.97	57,510	0.22%			11.00%	0.02%
Fifth Third Bancorp	FITB	686.09	33.60	23,053	0.09%	3.57%	0.00%	11.00%	0.01%

STANDARD AND POOR'S 500 INDEX

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Gilead Sciences Inc	GILD	1,254.31	61.81	77,529	0.29%	4.72%	0.01%	13.50%	0.04%
Hasbro Inc	HAS	139.44	81.88	11,418	0.04%	3.42%	0.00%	11.50%	0.00%
Huntington Bancshares Inc/OH	HBAN	1,439.18	12.03	17,313	0.06%	5.15%	0.00%	12.50%	0.01%
Welltower Inc	WELL	453.97	82.35	37,384	0.14%	2.96%	0.00%	3.50%	0.00%
Biogen Inc	BIIB	146.45	203.94	29,867				-10.50%	
Northern Trust Corp	NTRS	208.38	96.48	20,105	0.08%	2.90%	0.00%	8.00%	0.01%
Packaging Corp of America	PKG	93.70	137.50	12,884	0.05%	3.64%	0.00%	11.00%	0.01%
Paychex Inc	PAYX	359.90	113.87	40,982	0.15%	2.78%	0.00%	9.50%	0.01%
QUALCOMM Inc	QCOM	1,120.00	127.74	143,069	0.54%	2.35%	0.01%	19.00%	0.10%
Roper Technologies Inc	ROP	105.91	394.65	41,799	0.16%	0.63%	0.00%	8.50%	0.01%
Ross Stores Inc	ROST	349.93	70.23	24,575	0.09%	1.77%	0.00%	14.00%	0.01%
IDEXX Laboratories Inc	IDXX	84.01	350.73	29,464	0.11%			12.00%	0.01%
Starbucks Corp	SBUX	1,146.90	76.39	87,612	0.33%	2.57%	0.01%	16.50%	0.05%
KeyCorp	KEY	932.47	17.23	16,066	0.06%	4.53%	0.00%	9.50%	0.01%
Fox Corp	FOXA	311.68	32.16	10,024	0.04%	1.49%	0.00%	10.50%	0.00%
Fox Corp	FOX	245.07	29.70	7,278		1.62%			
State Street Corp	STT	367.12	61.65	22,633	0.08%	3.70%	0.00%	9.50%	0.01%
Norwegian Cruise Line Holdings Ltd	NCLH	419.10	11.12	4,660					
US Bancorp	USB	1,485.74	46.02	68,374	0.26%	4.00%	0.01%	6.00%	0.02%
A O Smith Corp	AOS	130.04	54.68	7,110	0.03%	2.05%	0.00%	11.00%	0.00%
NortonLifeLock Inc	NLOK	571.37	21.96	12,547	0.05%	2.28%	0.00%	9.50%	0.00%
T Rowe Price Group Inc	TROW	227.30	113.61	25,823	0.10%	4.22%	0.00%	9.50%	0.01%
Waste Management Inc	WM	415.16	152.98	63,511	0.24%	1.70%	0.00%	6.50%	0.02%
Constellation Brands Inc	STZ	159.33	233.06	37,133	0.14%	1.37%	0.00%	5.00%	0.01%
DENTSPLY SIRONA Inc	XRAY	215.45	35.73	7,698	0.03%	1.40%	0.00%	12.00%	0.00%
Zions Bancorp NA	ZION	151.36	50.90	7,704	0.03%	2.99%	0.00%	7.50%	0.00%
Alaska Air Group Inc	ALK	126.09	40.05	5,050					
Invesco Ltd	IVZ	455.03	16.13	7,340	0.03%	4.65%	0.00%	15.50%	0.00%
Linde PLC	LIN	501.93	287.53	144,319	0.54%	1.63%	0.01%	12.00%	0.06%
Intuit Inc	INTU	282.08	385.44	108,724	0.41%	0.71%	0.00%	17.50%	0.07%
Morgan Stanley	MS	1,749.28	76.06	133,051	0.50%	3.68%	0.02%	10.50%	0.05%
Microchip Technology Inc	MCHP	554.50	58.08	32,205	0.12%	1.90%	0.00%	10.00%	0.01%
Chubb Ltd	CB	423.71	196.58	83,293	0.31%	1.69%	0.01%	11.00%	0.03%
Hologic Inc	HOLX	249.38	69.30	17,282				25.00%	
Citizens Financial Group Inc	CFG	495.45	35.69	17,682	0.07%	4.37%	0.00%	8.50%	0.01%
O'Reilly Automotive Inc	ORLY	65.73	631.76	41,522	0.16%			13.00%	0.02%
Allstate Corp/The	ALL	274.98	126.73	34,849	0.13%	2.68%	0.00%	4.50%	0.01%
Equity Residential	EQR	376.04	72.22	27,158		3.46%		-6.00%	
BorgWarner Inc	BWA	239.58	33.37	7,995	0.03%	2.04%	0.00%	9.50%	0.00%
Keurig Dr Pepper Inc	KDP	1,418.55	35.39	50,202	0.19%	2.12%	0.00%	11.50%	0.02%
Organon & Co	OGN	253.64	33.75	8,560		3.32%			
Host Hotels & Resorts Inc	HST	714.78	15.68	11,208		1.53%		59.50%	
Incyte Corp	INCY	221.51	75.97	16,828				25.50%	
Simon Property Group Inc	SPG	328.64	94.92	31,194	0.12%	7.16%	0.01%	3.00%	0.00%
Eastman Chemical Co	EMN	128.95	89.77	11,576	0.04%	3.39%	0.00%	9.50%	0.00%
Twitter Inc	TWTR	764.18	37.40	28,580					
AvalonBay Communities Inc	AVB	139.82	194.25	27,160	0.10%	3.27%	0.00%	6.50%	0.01%
Prudential Financial Inc	PRU	375.00	95.68	35,880	0.13%	5.02%	0.01%	5.50%	0.01%
United Parcel Service Inc	UPS	734.44	182.54	134,064	0.50%	3.33%	0.02%	11.50%	0.06%
Walgreens Boots Alliance Inc	WBA	864.26	37.90	32,755	0.12%	5.04%	0.01%	7.50%	0.01%
STERIS PLC	STE	100.08	206.15	20,631	0.08%	0.83%	0.00%	11.50%	0.01%
McKesson Corp	MCK	143.58	326.21	46,838	0.18%	0.58%	0.00%	10.00%	0.02%
Lockheed Martin Corp	LMT	266.11	429.96	114,415	0.43%	2.60%	0.01%	7.00%	0.03%
AmerisourceBergen Corp	ABC	209.46	141.48	29,635	0.11%	1.30%	0.00%	8.50%	0.01%
Capital One Financial Corp	COF	393.05	104.19	40,952		2.30%			
Waters Corp	WAT	60.24	330.98	19,937	0.07%			6.00%	0.00%
Nordson Corp	NDSN	57.51	202.44	11,643	0.04%	1.01%	0.00%	12.00%	0.01%
Dollar Tree Inc	DLTR	224.56	155.85	34,997	0.13%			12.00%	0.02%
Darden Restaurants Inc	DRI	124.73	113.12	14,110	0.05%	4.28%	0.00%	19.50%	0.01%
Match Group Inc	MTCH	285.59	69.69	19,903				21.00%	
Domino's Pizza Inc	DPZ	36.05	389.71	14,047	0.05%	1.13%	0.00%	15.50%	0.01%
NVR Inc	NVR	3.29	4,004.14	13,174	0.05%			5.50%	0.00%
NetApp Inc	NTAP	221.19	65.24	14,430	0.05%	3.07%	0.00%	8.00%	0.00%
Citrix Systems Inc	CTXS	126.58	97.17	12,300	0.05%			7.50%	0.00%
DXC Technology Co	DXC	229.66	30.31	6,961	0.03%			5.00%	0.00%
Old Dominion Freight Line Inc	ODFL	113.35	256.28	29,050	0.11%	0.47%	0.00%	12.00%	0.01%
DaVita Inc	DVA	94.60	79.96	7,564	0.03%			12.00%	0.00%
Hartford Financial Services Group Inc/The	HIG	328.87	65.43	21,518	0.08%	2.35%	0.00%	6.50%	0.01%
Iron Mountain Inc	IRM	290.56	48.69	14,147	0.05%	5.08%	0.00%	11.00%	0.01%
Estee Lauder Cos Inc/The	EL	231.81	254.67	59,034	0.22%	0.94%	0.00%	14.00%	0.03%
Cadence Design Systems Inc	CDNS	275.76	150.03	41,372	0.16%			12.00%	0.02%
Tyler Technologies Inc	TYL	41.47	332.48	13,789	0.05%			14.00%	0.01%
Universal Health Services Inc	UHS	67.13	100.71	6,760	0.03%	0.79%	0.00%	9.00%	0.00%
Skyworks Solutions Inc	SWKS	160.93	92.64	14,908	0.06%	2.42%	0.00%	15.50%	0.01%
Quest Diagnostics Inc	DGX	117.37	132.98	15,607	0.06%	1.99%	0.00%	7.00%	0.00%
Activision Blizzard Inc	ATVI	781.88	77.86	60,877	0.23%	0.60%	0.00%	14.00%	0.03%
Rockwell Automation Inc	ROK	116.26	199.31	23,172	0.09%	2.25%	0.00%	9.50%	0.01%
Kraft Heinz Co/The	KHC	1,223.95	38.14	46,682	0.18%	4.20%	0.01%	5.50%	0.01%
American Tower Corp	AMT	465.53	255.59	118,985	0.45%	2.24%	0.01%	9.00%	0.04%
Regeneron Pharmaceuticals Inc	REGN	108.03	591.13	63,859	0.24%			3.00%	0.01%
Amazon.com Inc	AMZN	10,174.41	106.21	1,080,624				26.50%	
Jack Henry & Associates Inc	JKHY	72.86	180.02	13,117	0.05%	1.09%	0.00%	10.50%	0.01%
Ralph Lauren Corp	RL	44.83	89.65	4,019	0.02%	3.35%	0.00%	11.50%	0.00%
Boston Properties Inc	BXP	156.71	88.98	13,944		4.41%		-1.00%	
Amphenol Corp	APH	597.14	64.38	38,444	0.14%	1.24%	0.00%	12.50%	0.02%
Howmet Aerospace Inc	HWM	417.91	31.45	13,143	0.05%	0.25%	0.00%	12.00%	0.01%
Pioneer Natural Resources Co	PXD	241.96	223.08	53,976		13.23%		23.00%	
Valero Energy Corp	VLO	408.10	106.28	43,372	0.16%	3.69%	0.01%	11.00%	0.02%
Synopsys Inc	SNPS	152.97	303.70	46,457	0.17%			12.50%	0.02%
Etsy Inc	ETSY	127.12	73.21	9,306				24.50%	
CH Robinson Worldwide Inc	CHRW	127.27	101.37	12,901	0.05%	2.17%	0.00%	8.00%	0.00%

STANDARD AND POOR'S 500 INDEX

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Accenture PLC	ACN	664.19	277.65	184,412	0.69%	1.40%	0.01%	12.50%	0.09%
TransDigm Group Inc	TDG	54.61	536.67	29,305	0.11%			18.00%	0.02%
Yum! Brands Inc	YUM	285.16	113.51	32,369	0.12%	2.01%	0.00%	10.50%	0.01%
Prologis Inc	PLD	739.75	117.65	87,031	0.33%	2.69%	0.01%	6.00%	0.02%
FirstEnergy Corp	FE	570.93	38.39	21,918	0.08%	4.06%	0.00%	7.50%	0.01%
VeriSign Inc	VRSN	109.55	167.33	18,330	0.07%			8.50%	0.01%
Quanta Services Inc	PWR	143.71	125.34	18,012	0.07%	0.22%	0.00%	12.50%	0.01%
Henry Schein Inc	HSIC	138.05	76.74	10,594	0.04%			7.00%	0.00%
Ameren Corp	AEE	258.09	90.36	23,321	0.09%	2.61%	0.00%	6.50%	0.01%
ANSYS Inc	ANSS	86.99	239.29	20,816	0.08%			9.00%	0.01%
FactSet Research Systems Inc	FDS	37.90	384.57	14,574	0.05%	0.93%	0.00%	10.50%	0.01%
NVIDIA Corp	NVDA	2,500.00	151.59	378,975		0.11%		23.00%	
Sealed Air Corp	SEE	146.08	57.72	8,432	0.03%	1.39%	0.00%	10.00%	0.00%
Cognizant Technology Solutions Corp	CTSH	521.17	67.49	35,174	0.13%	1.60%	0.00%	7.00%	0.01%
SVB Financial Group	SIVB	58.85	394.99	23,246	0.09%			6.00%	0.01%
Intuitive Surgical Inc	ISRG	358.96	200.71	72,046	0.27%			12.50%	0.03%
Take-Two Interactive Software Inc	TTWO	161.98	122.53	19,848	0.07%			12.50%	0.01%
Republic Services Inc	RSG	315.89	130.87	41,341	0.16%	1.41%	0.00%	12.50%	0.02%
eBay Inc	EBAY	559.84	41.67	23,329	0.09%	2.11%	0.00%	15.50%	0.01%
Goldman Sachs Group Inc/The	GS	343.45	297.02	102,011	0.38%	2.69%	0.01%	5.00%	0.02%
SBA Communications Corp	SBAC	107.83	320.05	34,511		0.89%		35.50%	
Sempra Energy	SRE	314.31	150.27	47,231	0.18%	3.05%	0.01%	11.50%	0.02%
Moody's Corp	MCO	184.50	271.97	50,178	0.19%	1.03%	0.00%	8.00%	0.02%
ON Semiconductor Corp	ON	434.51	50.31	21,860				23.00%	
Booking Holdings Inc	BKNG	40.62	1,748.99	71,049	0.27%			14.00%	0.04%
F5 Inc	FFIV	60.47	153.04	9,255	0.03%			10.00%	0.00%
Akamai Technologies Inc	AKAM	160.31	91.33	14,641	0.05%			9.50%	0.01%
Charles River Laboratories International Inc	CRL	50.81	213.97	10,871	0.04%			12.00%	0.00%
MarketAxess Holdings Inc	MKTX	37.74	256.01	9,662	0.04%	1.09%	0.00%	11.50%	0.00%
Devon Energy Corp	DVN	660.00	55.11	36,373		9.22%		30.00%	
Bio-Techne Corp	TECH	39.23	346.64	13,600	0.05%	0.37%	0.00%	17.50%	0.01%
Alphabet Inc	GOOGL	300.76	2,179.26	655,443					
Teleflex Inc	TFX	46.90	245.85	11,530	0.04%	0.55%	0.00%	13.50%	0.01%
Allegion plc	ALLE	87.81	97.90	8,596	0.03%	1.68%	0.00%	10.50%	0.00%
Netflix Inc	NFLX	444.27	174.87	77,690	0.29%			12.50%	0.04%
Warner Bros Discovery Inc	WBD	2,426.84	13.42	32,568					
Agilent Technologies Inc	A	298.71	118.77	35,478	0.13%	0.71%	0.00%	11.50%	0.02%
Trimble Inc	TRMB	250.14	58.23	14,566	0.05%			10.00%	0.01%
Elevance Health Inc	ELV	241.09	482.58	116,343		1.06%			
CME Group Inc	CME	359.42	204.70	73,573	0.28%	1.95%	0.01%	7.50%	0.02%
Juniper Networks Inc	JNPR	323.10	28.50	9,208	0.03%	2.95%	0.00%	9.00%	0.00%
BlackRock Inc	BLK	151.50	609.04	92,271	0.35%	3.21%	0.01%	10.00%	0.03%
DTE Energy Co	DTE	193.74	126.75	24,557	0.09%	2.79%	0.00%	4.50%	0.00%
Celanese Corp	CE	108.31	117.61	12,738	0.05%	2.31%	0.00%	9.50%	0.00%
Nasdaq Inc	NDAQ	164.68	152.54	25,120	0.09%	1.57%	0.00%	6.00%	0.01%
Philip Morris International Inc	PM	1,550.11	98.74	153,058	0.57%	5.06%	0.03%	7.00%	0.04%
Ingersoll Rand Inc	IR	405.93	42.08	17,082		0.19%			
Salesforce Inc	CRM	995.00	165.04	164,215	0.62%			16.50%	0.10%
Huntington Ingalls Industries Inc	HII	40.05	217.82	8,723	0.03%	2.17%	0.00%	10.00%	0.00%
MetLife Inc	MET	813.21	62.79	51,061	0.19%	3.19%	0.01%	7.50%	0.01%
Tapestry Inc	TPR	251.80	30.52	7,685	0.03%	3.28%	0.00%	10.00%	0.00%
CSX Corp	CSX	2,174.26	29.06	63,184	0.24%	1.38%	0.00%	10.00%	0.02%
Edwards Lifesciences Corp	EW	621.75	95.09	59,122	0.22%			12.50%	0.03%
Ameriprise Financial Inc	AMP	109.90	237.68	26,122	0.10%	2.10%	0.00%	15.00%	0.01%
Zebra Technologies Corp	ZBRA	52.51	293.95	15,436	0.06%			11.50%	0.01%
Zimmer Biomet Holdings Inc	ZBH	209.58	105.06	22,018	0.08%	0.91%	0.00%	7.00%	0.01%
Camden Property Trust	CPT	106.52	134.48	14,325	0.05%	2.80%	0.00%	2.50%	0.00%
CBRE Group Inc	CBRE	326.86	73.61	24,060	0.09%			8.50%	0.01%
Mastercard Inc	MA	964.92	315.48	304,413	1.14%	0.62%	0.01%	13.50%	0.15%
CarMax Inc	KMX	159.17	90.48	14,401	0.05%			13.00%	0.01%
Intercontinental Exchange Inc	ICE	558.27	94.04	52,499	0.20%	1.62%	0.00%	6.50%	0.01%
Fidelity National Information Services Inc	FIS	610.77	91.67	55,989		2.05%		52.00%	
Chipotle Mexican Grill Inc	CMG	27.96	1,307.26	36,554	0.14%			16.50%	0.02%
Wynn Resorts Ltd	WYNN	115.97	56.98	6,608				27.00%	
Live Nation Entertainment Inc	LYV	228.06	82.58	18,834					
Assurant Inc	AIZ	54.09	172.85	9,349	0.04%	1.57%	0.00%	14.00%	0.00%
NRG Energy Inc	NRG	237.28	38.17	9,057		3.67%		-10.50%	
Monster Beverage Corp	MNST	529.67	92.70	49,101	0.18%			11.50%	0.02%
Regions Financial Corp	RF	934.50	18.75	17,522	0.07%	3.63%	0.00%	10.50%	0.01%
Baker Hughes Co	BKR	984.58	28.87	28,425		2.49%			
Mosaic Co/The	MOS	361.99	47.23	17,097		1.27%		33.00%	
Expedia Group Inc	EXPE	151.57	94.83	14,374					
Evergy Inc	EVRG	229.48	65.25	14,973	0.06%	3.51%	0.00%	7.50%	0.00%
CF Industries Holdings Inc	CF	208.60	85.73	17,883		1.87%		26.50%	
APA Corp	APA	338.23	34.90	11,804		1.43%			
Leidos Holdings Inc	LDOS	136.66	100.71	13,763	0.05%	1.43%	0.00%	9.00%	0.00%
Alphabet Inc	GOOG	313.38	2,187.45	685,494	2.57%			18.50%	0.48%
Cooper Cos Inc/The	COO	49.34	313.12	15,448	0.06%	0.02%	0.00%	16.00%	0.01%
TE Connectivity Ltd	TEL	322.17	113.15	36,454	0.14%	1.98%	0.00%	10.50%	0.01%
Discover Financial Services	DFS	280.97	94.58	26,574	0.10%	2.54%	0.00%	16.00%	0.02%
Visa Inc	V	1,645.72	196.89	324,026	1.22%	0.76%	0.01%	13.50%	0.16%
Mid-America Apartment Communities Inc	MAA	115.43	174.67	20,162	0.08%	2.86%	0.00%	4.50%	0.00%
Xylem Inc/NY	XYL	180.09	78.18	14,080	0.05%	1.53%	0.00%	6.50%	0.00%
Marathon Petroleum Corp	MPC	541.00	82.21	44,475		2.82%			
Advanced Micro Devices Inc	AMD	1,620.51	76.47	123,920				25.50%	
Tractor Supply Co	TSCO	111.88	193.85	21,688	0.08%	1.90%	0.00%	12.50%	0.01%
ResMed Inc	RMD	146.29	209.63	30,666	0.12%	0.80%	0.00%	8.50%	0.01%
Mettler-Toledo International Inc	MTD	22.68	1,148.77	26,054	0.10%			13.50%	0.01%
Copart Inc	CPRT	237.67	108.66	25,826	0.10%			12.00%	0.01%
VICI Properties Inc	VICI	963.00	29.79	28,688	0.11%	4.83%	0.01%	8.50%	0.01%
Fortinet Inc	FTNT	802.64	56.58	45,413				21.50%	

STANDARD AND POOR'S 500 INDEX

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] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Albemarle Corp	ALB	117.11	208.98	24,474	0.09%	0.76%	0.00%	15.00%	0.01%
Moderna Inc	MRNA	397.76	142.85	56,820				-2.50%	
Essex Property Trust Inc	ESS	65.33	261.51	17,085		3.37%		-4.00%	
Realty Income Corp	O	601.60	68.26	41,065	0.15%	4.35%	0.01%	6.00%	0.01%
Westrock Co	WRK	254.85	39.84	10,153	0.04%	2.51%	0.00%	20.00%	0.01%
Westinghouse Air Brake Technologies Corp	WAB	182.65	82.08	14,992	0.06%	0.73%	0.00%	9.00%	0.01%
Pool Corp	POOL	40.07	351.23	14,075	0.05%	1.14%	0.00%	19.00%	0.01%
Western Digital Corp	WDC	313.17	44.83	14,039	0.05%			20.00%	0.01%
PepsiCo Inc	PEP	1,382.68	166.66	230,438	0.86%	2.76%	0.02%	6.00%	0.05%
Diamondback Energy Inc	FANG	177.55	121.15	21,510		10.07%			
ServiceNow Inc	NOW	200.46	475.52	95,323				45.50%	
Church & Dwight Co Inc	CHD	242.77	92.66	22,495	0.08%	1.13%	0.00%	6.00%	0.01%
Duke Realty Corp	DRE	384.82	54.95	21,146		2.04%		-2.50%	
Federal Realty OP LP	FRT	79.42	95.74	7,604	0.03%	4.47%	0.00%	2.50%	0.00%
MGM Resorts International	MGM	426.05	28.95	12,334		0.03%		25.00%	
American Electric Power Co Inc	AEP	513.54	95.94	49,269	0.18%	3.25%	0.01%	6.50%	0.01%
SolarEdge Technologies Inc	SEDG	55.39	273.68	15,158				22.00%	
PTC Inc	PTC	116.98	106.34	12,439				29.00%	
JB Hunt Transport Services Inc	JBHT	104.78	157.47	16,500	0.06%	1.02%	0.00%	11.50%	0.01%
Lam Research Corp	LRCX	138.72	426.15	59,113		1.41%		21.50%	
Mohawk Industries Inc	MHK	63.54	124.09	7,885	0.03%			10.50%	0.00%
Pentair PLC	PNR	165.40	45.77	7,570	0.03%	1.84%	0.00%	13.00%	0.00%
Vertex Pharmaceuticals Inc	VRTX	255.76	281.79	72,069	0.27%			18.50%	0.05%
Amcor PLC	AMCR	1,502.77	12.43	18,679	0.07%	3.86%	0.00%	15.00%	0.01%
Meta Platforms Inc	META	2,293.52	161.25	369,830	1.39%			16.00%	0.22%
T-Mobile US Inc	TMUS	1,253.59	134.54	168,657	0.63%			9.50%	0.06%
United Rentals Inc	URI	71.61	242.91	17,395	0.07%			18.00%	0.01%
Alexandria Real Estate Equities Inc	ARE	163.22	145.03	23,672	0.09%	3.25%	0.00%	10.00%	0.01%
Honeywell International Inc	HON	680.73	173.81	118,318	0.44%	2.26%	0.01%	11.00%	0.05%
ABIOMED Inc	ABMD	45.63	247.51	11,293	0.04%			7.50%	0.00%
Delta Air Lines Inc	DAL	641.06	28.97	18,571					
United Airlines Holdings Inc	UAL	326.73	35.42	11,573					
Seagate Technology Holdings PLC	STX	214.84	71.44	15,348	0.06%	3.92%	0.00%	15.00%	0.01%
News Corp	NWS	197.27	15.89	3,135		1.26%			
Centene Corp	CNC	584.89	84.61	49,487	0.19%			10.00%	0.02%
Martin Marietta Materials Inc	MLM	62.28	299.24	18,638	0.07%	0.82%	0.00%	5.50%	0.00%
Teradyne Inc	TER	160.20	89.55	14,346	0.05%	0.49%	0.00%	8.50%	0.00%
PayPal Holdings Inc	PYPL	1,158.04	69.84	80,878	0.30%			16.00%	0.05%
Tesla Inc	TSLA	1,036.39	673.42	697,926				50.50%	
DISH Network Corp	DISH	291.56	17.93	5,228	0.02%			2.50%	0.00%
Penn National Gaming Inc	PENN	166.80	30.42	5,074				28.00%	
Dow Inc	DOW	728.10	51.61	37,577	0.14%	5.43%	0.01%	15.00%	0.02%
Everest Re Group Ltd	RE	39.44	280.28	11,054	0.04%	2.35%	0.00%	17.50%	0.01%
Teledyne Technologies Inc	TDY	46.84	375.11	17,571	0.07%			11.50%	0.01%
News Corp	NWSA	388.47	15.58	6,052		1.28%			
Exelon Corp	EXC	980.14	45.32	44,420		2.98%			
Global Payments Inc	GPN	281.54	110.64	31,150	0.12%	0.90%	0.00%	17.00%	0.02%
Crown Castle International Corp	CCI	433.03	168.38	72,914	0.27%	3.49%	0.01%	12.00%	0.03%
Aptiv PLC	APTV	270.93	89.07	24,132				27.50%	
Advance Auto Parts Inc	AAP	60.64	173.09	10,496	0.04%	3.47%	0.00%	16.00%	0.01%
Align Technology Inc	ALGN	78.81	236.67	18,651	0.07%			17.00%	0.01%
Illumina Inc	ILMN	157.10	184.36	28,963	0.11%			6.50%	0.01%
LKQ Corp	LKQ	282.83	49.09	13,884	0.05%	2.04%	0.00%	13.00%	0.01%
Nielsen Holdings PLC	NLSN	359.69	23.22	8,352		1.03%			
Zoetis Inc	ZTS	470.63	171.89	80,896	0.30%	0.76%	0.00%	11.00%	0.03%
Digital Realty Trust Inc	DLR	284.67	129.83	36,959		3.76%		-3.50%	
Equinix Inc	EQIX	91.02	657.02	59,803	0.22%	1.89%	0.00%	15.00%	0.03%
Molina Healthcare Inc	MOH	58.70	279.61	16,413	0.06%			11.00%	0.01%
Las Vegas Sands Corp	LVS	764.11	33.59	25,666	0.10%			13.50%	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] Source: Bloomberg Professional as of June 30, 2022
[5] Source: Bloomberg Professional as of June 30, 2022
[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 June 30, 2022
[9] Equals [7] x [8]
[10] Source: Value Line, as of June 30, 2022
[11] Equals [7] x [10]

ER-2022-0337

SCHEDULE AEB-D2

ATTACHMENT 6,

PAGE 1

IS CONFIDENTIAL IN ITS

ENTIRETY

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ER-2022-0337

SCHEDULE AEB-D2

ATTACHMENT 6,

PAGE 2

IS CONFIDENTIAL IN ITS

ENTIRETY

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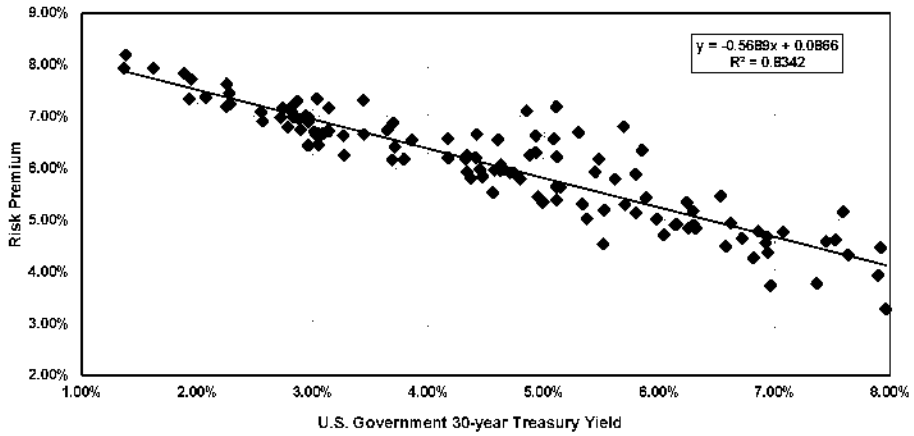

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.913339
R Square	0.834189
Adjusted R Square	0.832807
Standard Error	0.004249
Observations	122

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.010901	0.010901	603.714004	0.000000
Residual	120	0.002167	0.000018		
Total	121	0.013068			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.0866	0.00113	76.84	0.000000	0.084324	0.088785	0.084324	0.088785
U.S. Govt. 30-year Treasury	(0.5689)	0.02315	(24.57)	0.000000	(0.614761)	(0.523073)	(0.614761)	(0.523073)

	[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]	3.18%	6.85%	10.03%
Blue Chip Near-Term Projected Forecast (Q4 2022 - Q4 2023) [5]	3.74%	6.53%	10.27%
Blue Chip Long-Term Projected Forecast (2023-2027) [6]	3.80%	6.49%	10.29%
AVERAGE			10.20%

Notes:
[1] Source: Regulatory Research Associates, rate cases through June 30, 2022
[2] Source: 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] Source: S&P Capital IQ Pro, 30-day average as of June 30, 2022
[5] Source: Blue Chip Financial Forecasts, Vol. 41, No. 7, July 1, 2022, at 2
[6] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2021, at 14
[7] See notes [4], [5] & [6]
[8] Equals 0.086555 + (-0.568917 x Column [7])
[9] Equals Column [7] + Column [8]

ER-2022-0337

SCHEDULE AEB-D2

ATTACHMENT 7

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ER-2022-0337

SCHEDULE AEB-D2

ATTACHMENT 8

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ER-2022-0337

SCHEDULE AEB-D2

ATTACHMENT 9

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BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust Its Revenues for Electric Service.	)))	Case No. ER-2022-0337

AFFIDAVIT OF ANN E. BULKLEY

COMMONWEALTH OF MASSACHUSETTS)
) **ss**
CITY OF BOSTON)

Ann E. Bulkley, being first duly sworn states:

My name is Ann E. Bulkley, and on my oath declare that I am of sound mind and lawful age; that I have prepared the foregoing *Direct Testimony*; and further, under the penalty of perjury, that the same is true and correct to the best of my knowledge and belief.

Ann E. Bulkley

Sworn to me this 26th day of July, 2022.

BEFORE THE PUBLIC SERVICE COMMISSION OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust its Revenues for Electric Service	)))	**File No. ER-2022-0337** Tracking No. YE-2023-0031

REPORT AND ORDER

Issue Date: June 14, 2023

Effective Date: June 24, 2023

TABLE OF CONTENTS

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CONSUMERS COUNCIL OF MISSOURI:

John B. Coffman, Counsel, 871 Tuxedo Blvd., St. Louis, Missouri 63119

REGULATORY LAW JUDGE: John T. Clark

REPORT AND ORDER

This case involves Union Electric Company d/b/a Ameren Missouri's (Ameren Missouri or "the Company") request to increase its annual revenues. Ameren Missouri says an increase is needed because of investments in its infrastructure, increases in its cost of capital since its last rate case, higher depreciation costs, and other changes in the cost of providing service.[1] This Report and Order approves a Stipulation and Agreement (Agreement) between several of the parties resolving most of the issues in this rate case. This Report and Order also resolves the remaining unsettled issues not addressed in the Agreement.

Procedural History

Ameren Missouri filed tariff sheets on August 1, 2022, to increase its electric rate base annual revenues by $316 million. Ameren Missouri calculates that its request would raise a typical residential customer's bill by approximately 11.64 percent. Filing those tariff sheets initiated a general rate case. So that the Commission would have time to review Ameren Missouri's request, and so the parties would have time to prepare for an evidentiary hearing, the Commission suspended Ameren Missouri's general rate increase tariff sheets until July 1, 2023, the maximum amount of time allowed under the statute.

The Commission granted the intervention requests of Midwest Energy Consumers Group (MECG); Missouri Industrial Energy Consumers (MIEC); Renew Missouri Advocates d/b/a Renew Missouri; Consumers Council of Missouri (Consumers Council); Sierra Club; National Association for the Advancement of Colored People (NAACP); and

[1] Ameren Missouri's last general rate case concluded in February 2022.

Metropolitan Congregations United (Metropolitan Congregations), allowing them to become parties in this rate case. The Staff of the Commission (Staff) and the Office of the Public Counsel (Public Counsel) are parties by statute.

The Commission established the test year for this case as the 12-months ending March 31, 2022, trued-up for known and measurable revenue, rate base, and expense items through December 31, 2022. The test year is a 12-month period used to determine the cost of Ameren Missouri providing service to customers. The Commission also issued a procedural schedule with an evidentiary hearing, for the parties to present evidence to the Commission on disputed case issues.

The Commission held six public comment hearings between January 31[2] and February 9, for the public to comment on Ameren Missouri's proposed revenue increase. Four of the public comment hearings were conducted in-person and two were conducted by video and teleconference. The Commission also received numerous written comments.

The parties prefiled direct, rebuttal, surrebuttal, and true-up direct testimony.

The Commission held an evidentiary hearing on April 12 through April 13, and an on-the-record presentation about the Agreement on April 14. The parties filed initial post-hearing briefs on May 5, and reply briefs on May 15.

The Agreement

On April 7, the parties filed the Agreement resolving all issues in the case related to Ameren Missouri's revenue requirement. The Agreement also resolves additional issues. The Commission will not address the issues the Agreement resolves, because

[2] Unless a year is specifically attached, date references are to 2023.

this Report and Order approves the Agreement as a resolution of those issues. Ameren Missouri, Staff, Public Counsel, MIEC, MECG, and Consumers Council cosigned the Agreement. The Agreement states that the remaining parties, Sierra Club, NAACP, Metropolitan Congregations, and Renew Missouri do not oppose the Agreement.

The revenue requirement is the amount Ameren Missouri is authorized to collect to cover its costs and a return on its investment. The Agreement resolves the revenue requirement allowing Ameren Missouri to increase its revenues by $140 million. That amount is less than half of the $316 million Ameren Missouri originally requested. The Agreement is a "black box" settlement. A "black box" settlement means that, while the parties reached an agreement on the issues, the Agreement does not address the details of how those agreements were reached, or how the global numbers were calculated.

The Agreement includes setting Ameren Missouri's Weighted Average Cost of Capital at 6.82 percent for Plant-in-Service Accounting deferrals, Ameren Missouri's Allowance for Funds Used During Construction, and the Renewable Energy Standard Rate Adjustment Mechanism. The Agreement sets the base amount for the Renewable Energy Standard Rate Adjustment Mechanism at $7,205,895. The Agreement sets the base factor for Ameren Missouri's Fuel Adjustment Clause (FAC) at $0.01439 per kWh for summer and $0.01328 per kWh for winter. The Agreement establishes trackers for taxes, retirement benefits, and Renewable Energy Standard compliance. The Agreement also increases the budget for specific Low-Income Programs and provides that half of the contributions for those programs will come from shareholders and half will come from ratepayers.

Commission Rule 20 CSR 4240-2.115(1)(B) provides that the Commission may resolve part of a contested case based upon a stipulation and agreement. The Agreement is not considered unanimous by the Commission's rule 20 CSR 4240-2.115(2), even though no party objected to the Agreement, because all parties did not sign the Agreement. That rule allows parties seven days to object to a non-unanimous stipulation and agreement. That rule also allows the Commission to treat a non-unanimous stipulation and agreement as unanimous if no party timely objects. More than seven days have passed since the signatories filed the Agreement, and no party has objected. So, the Commission will treat the Agreement as unanimous.

After examining the Agreement, the Commission finds that it reasonably resolves the issues it addresses. Though it is a "black box" agreement, the Commission finds that the interests of the signatory parties were represented, and the non-signatory parties did not oppose the Agreement. As such, the Commission finds the interests of the Company, the ratepayers, Staff, and the various intervening entities were adequately represented and the Agreement provides for just and reasonable rates. The Commission will approve the Agreement and will direct the signatories to the Agreement to comply with its terms.[3]

Pending Motions

Staff filed a motion to strike portions of the testimony of Ameren Missouri witness Nicholas Bowden. At the evidentiary hearing, counsel for Staff stated that its motion to strike was moot if the Commission approved the Agreement.[4] Staff's motion is moot, so the Commission will not address it.

[3] A copy of the agreement is attached to this order.
[4] Transcript, pages 365-366.

Sierra Club filed a motion for leave to late file its initial brief. The Commission will grant that motion.

General Findings of Fact[5]

The Commission makes the following general findings of fact:

1. Ameren Missouri is an investor-owned electric utility providing retail electric service to a 24,000 square mile area in central and eastern Missouri, including the greater St. Louis area.[6]

2. Ameren Missouri is the largest public utility in Missouri[7] and provides electric service to more than 1.2 million customers.[8]

3. Ameren Missouri is a member of the Midcontinent Independent System Operator, Inc. (MISO), a regional transmission organization (RTO). The Commission has authorized Ameren Missouri to participate in MISO through May 2024.[9]

4. Section 386.710(2), RSMo, and Commission Rule 20 CSR 4240-2.010(10), designates Public Counsel as a party this case.

5. Commission Rule 20 CSR4240-2.010(10) designates Staff as a party to this case.

General Conclusions of Law

A. Ameren Missouri is a public utility, and an electrical corporation, as defined in Subsections 386.020(15) and (43), RSMo. So, Ameren Missouri is subject to the Commission's jurisdiction under Chapters 386 and 393, RSMo.

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[5] All findings of fact and conclusions of law are cumulative and are not limited to the section where they are introduced.
[6] Exhibit 166, Won Direct, page 19.
[7] Exhibit 12, Bulkley Direct, page 33.
[8] Exhibit 23, Reed Direct, page 3.
[9] Exhibit 166, Won Direct, page 19.

B. The Commission has subject matter jurisdiction over Ameren Missouri's rate increase request under Section 393.150, RSMo.

C. Section 393.150, RSMo, authorizes the Commission to suspend the effective date of a proposed tariff for 120 days beyond its effective date, plus an additional six months.

D. Ameren Missouri can charge only those amounts set forth in its tariffs.[10]

E. Subsection 393.140(11), RSMo, gives the Commission authority to regulate the rates Ameren Missouri may charge its customers for electric service.

F. Utilities are required to provide safe and adequate service.[11]

G. The Commission must determine whether the proposed rates are just and reasonable when deciding the rates Ameren Missouri may charge its customers.[12]

H. Ameren Missouri has the burden of proving its proposed rates are just and reasonable, under Section 393.150.2, RSMo: "[a]t any hearing involving a rate sought to be increased, the burden of proof to show that the increased rate or proposed increased rate is just and reasonable shall be upon the ... electrical corporation . . . ."

I. Ameren Missouri must meet the preponderance of the evidence standard to satisfy its burden of proof.[13] Ameren Missouri must convince the Commission it is "more likely than not" that its proposed rate increase is just and reasonable" to meet this standard.[14]

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[10] Sections 393.130 and 393.140, RSMo.
[11] Sections 393.130 and 393.140, RSMo.
[12] Section 393.150.2, RSMo.
[13] *Bonney v. Environmental Engineering, Inc.*, 224 S.W.3d 109, 120 (Mo. App. 2007).
[14] *Holt v. Director of Revenue, State of Mo.*, 3 S.W.3d 427, 430 (Mo. App. 1999).

J. Witness credibility is a matter for the fact-finder, "which is free to believe none, part, or all of the testimony."[15]

K. As fact-finder, an administrative agency like the Commission receives deference when choosing between conflicting evidence.[16]

L. A reviewing court will not substitute its judgment for the Commission's judgment, where that decision involves an exercise of the Commission's regulatory discretion, particularly on issues within Commission's area of expertise.[17]

M. MECG's proposed shift to increase the demand component for Large General Service and Small Primary Service, and decrease energy charges, allocation of production and distribution costs, and the reasonableness of Rider B calculations were also issues in File No. ER-2021-0240.[18]

Issues for Commission Determination

The remainder of this Report and Order decides the issues not settled in the Agreement. The parties presented evidence to the Commission on the unsettled issues at the evidentiary hearing and argued these issues in briefs.

The parties separated unsettled issues into three categories: 1) Class cost of service, revenue allocation, rate design, and Ameren Missouri's request for a rate switching tracker; 2) Ameren Missouri's continuing property record; and 3) identification of avoided capital investments for two power plants. Commission decisions on some

[15] *State ex rel. Public Counsel v. Missouri Public Service Com'n*, 289 S.W.3d 240, 247 (Mo. App. 2009).
[16] *State ex rel. Missouri Office of Public Counsel v. Public Service Com'n of State*, 293 S.W.3d 63, 80 (Mo. App. 2009).
[17] *State ex rel. Missouri Gas Energy v. Public Service Com'n*, 186 S.W.3d 376, 382 (Mo. App. 2005).
[18] ER-2021-0240, Report and Order (issued February 2, 2022).

issues make deciding other issues unnecessary. The Commission rearranged issues within these categories for clarity.

1. Class Cost of Service, Revenue Allocation, Rate Design and Rate Switching Tracker.

A. Which parties' Class Cost of Service Study should be used in this rate case and used as a starting point for the non-residential rate design working case agreed to by the parties in Ameren Missouri's last electric general rate case, File No. ER-2021-0240?

B. How should any rate increase be allocated to the customer classes?

These issues are related and the Commission will address them together.

Findings of Fact:

6. A Class Cost of Service Study (CCOSS) is a tool used to design equitable rates. The purpose of a CCOSS is to allocate cost responsibility to customer classes based on causation.[19]

7. Ameren Missouri organizes customers with similar service voltages, uses, and demands into classes. Ameren Missouri currently serves the following customer classes: Residential or 1(M); Small General Service (SGS) or 2(M); Large General Service (LGS) or 3(M); Small Primary Service (SPS) or 4(M); Company-Owned Street & Outdoor Area Lighting 5(M); Customer-Owned Street & Outdoor Area Lighting 6(M); and Large Primary Service (LPS) or 11(M) classes.[20]

8. Ameren Missouri and Staff each developed a CCOSS to support their class allocation proposals. MECG and MIEC did not prepare their own CCOSSs, but used Ameren Missouri's CCOSS as a starting point and modified it to support their allocation proposals.

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[19] Exhibit 35, Hickman Direct, page 5.
[20] Exhibit 35, Hickman Direct, page 6.

9. Ameren Missouri prepared a CCOSS for its production plant using the 4 Non-Coincident version of Peak Average and Excess methodology (4NCP A&E).[21] The Average and Excess method allocates costs based on a weighting of average class demand and class excess demand during the CCOSS period. The Non-Coincident Peak method allocates costs based on the peak demand of each customer class at any time during the study period, without regard to the time of occurrence or magnitude of the coincident system peaks.[22] Ameren Missouri's application of the 4NCP A&E considers the four maximum non-coincident peaks months for each customer class that occurred during the test year. Ameren Missouri's study determined that those peaks occurred from June to September. [23]

10. Ameren Missouri witness Thomas Hickman credibly testified that Ameren Missouri has used the 4NCP methodology in Missouri rate cases since at least 2016, and he does not believe that Ameren Missouri has used a method other than the 4NCP in the last decade.[24]

11. Production plant investment is classified for allocation purposes as demand-related or energy-related. Production costs that are fixed do not vary with the amount of kWhs generated and are considered to be demand-related. Production fuel expense is considered a variable cost. The amount of fuel burned or fuel expense is closely related to the amount of energy that customers use. Fuel expense is an energy-related cost. Most production operation and maintenance (O&M) expenses are fixed and

[21] Exhibit 35, Hickman Direct, page 20.
[22] Exhibit 35, Hickman Direct, page 19.
[23] Exhibit 35, Hickman Direct, page 21.
[24] Transcript, page 158.

classified as demand-related. Variable production O&M expenses are classified as energy-related. Demand-related and energy-related types of operating costs are not impacted by the number of customers served.[25]

12. Energy-related costs are those costs related directly to the customer's consumption of electrical energy (kWh), and consist primarily of fuel, fuel handling, interchange power costs, and a portion of production plant maintenance expenses. Demand-related costs are rate base investment and related operating expenses associated with the facilities necessary to supply a customer's service requirements during periods of maximum or peak levels of power consumption each month. The major portion of demand-related costs consists of generation and transmission plant and the non-customer-related portion of distribution plant.[26]

13. The 4NCP method does not include any considerations for renewable generation plant characteristics that are different from baseload generation. The 4NCP method also does not include any consideration for use of advanced metering infrastructure (AMI) data that can differentiate between class energy consumption during hours of the day.[27]

14. The electric distribution system is classified as both demand-related and customer-related. A portion of the cost of the distribution system consisting of poles, wires and transformers is required simply to construct a system's electrical pathways that comply with local or national safety and reliability codes, and to attach customers to that system, regardless of their demand or energy requirements. This portion of the electric

[25] Exhibit 350, Brubaker Direct, pages 10-11.
[26] Exhibit 35, Hickman Direct, page 9.
[27] Transcript, page 158.

distribution system may be considered a customer-related cost since it depends primarily on the number of customers, rather than demand or energy usage. Electric distribution system components that are sized to accommodate additional load beyond the capacity of the system, required by local or national safety and reliability codes, are considered demand-related cost.[28]

15. The customer-related cost components of the distribution system are those costs necessary to simply provide reliable and safe service to a customer, without the consideration of the amount of the customer's electrical use.[29]

16. Ameren Missouri used a minimum size study to classify distribution costs between demand and customer components.[30] A minimum-size distribution study uses the minimum size pole, conductor, cable, and transformer that is currently installed or used by Ameren Missouri to serve its customers and classifies those costs as demand-related. The average book cost for the minimum standard item of equipment normally determines the customer-related cost of all installed units.[31]

17. The National Association of Regulatory Utility Commissioners' (NARUC) cost allocation manual from 1992 describes over 18 different production cost allocation methods, many of which have multiple variations.[32]

18. The 1992 NARUC manual, when addressing embedded cost of service studies like Ameren Missouri's minimum distribution study, states that classifying distribution plant using the minimum-size method "assumes that a minimum size

[28] Exhibit 350, Brubaker Direct, pages 11-12.
[29] Exhibit 35, Hickman Direct, page 9.
[30] Exhibit 38, Brown Surrebuttal, page 12.
[31] Exhibit 35, Hickman Direct, page 10.
[32] Exhibit 136, Lange Direct, page 19.

distribution can be built to serve the minimum loading requirements of the customer."[33] Ameren Missouri has approximately 648 primary voltage customers.[34] Ameren Missouri's minimum distribution study for plant accounts 364-368 uses components that operate at primary voltages,[35] but most of Ameren Missouri's customers take service at secondary voltage.[36] So, Ameren Missouri's minimum size study is oversized for a majority of Ameren Missouri's customers.[37]

19. Customers served at higher voltages, including 25 kV, have generally not had to pay costs for lower-voltage infrastructure under the theory that customers served at higher voltages do not use that infrastructure. Likewise, a customer served at 13.2 kV has not had to pay for secondary-voltage infrastructure on the premise that they are not using that infrastructure.[38]

20. Staff argues that the Average and Excess allocator is less reasonable for allocation of the revenue requirement associated with Ameren Missouri's production plant included in rate base since MISO's integrated marketplace was introduced.[39] This is largely because Ameren Missouri's fuel costs vary with the demand for energy in a given hour of the regional load, and do not vary with the Ameren Missouri load relied on in Ameren Missouri's Average and Excess allocator analysis.[40]

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[33] Exhibit 137, page 34.
[34] Exhibit 35, Hickman Direct, page 6.
[35] Exhibit 137, Lange Rebuttal, page 37.
[36] Exhibit 137, Lange Rebuttal, page 36.
[37] Exhibit 137, Lange Rebuttal, page 47.
[38] Exhibit 136, Lange Direct, page 12.
[39] Exhibit 137, Lange Rebuttal, page 25.
[40] Exhibit 137, Lange Rebuttal, page 26.

21. In November of 2021, MISO submitted proposed revisions to its Open Access Transmission, Energy and Operating Reserve Markets Tariff to establish seasonal resource adequacy requirements.[41]

22. Staff prepared a CCOSS in an effort to move toward rate modernization. Staff used different allocation methods for different generation resources. Staff's generation allocation study categorized generation assets as those with significant variable operation costs that can be avoided if the generation resource is offline (Type 1) and generation assets with no or minimal variable operation costs that are limited by weather or other factors beyond Ameren Missouri's control (Type 2).[42] Staff allocated Type 1 assets on the basis of demand, utilizing an "All Peak Hours Approach" (described in the 1992 NARUC manual) based on each class's contribution to identified MISO Resource Adequacy hours. That is then offset by a class's allocation of Type 2 assets.[43]

23. Staff's CCOS approach differs from other parties' CCOSSs in that it attempts to allocate specific utility infrastructure to the customers who /predominantly use that infrastructure.[44]

24. Staff sees its approach in this case as an interim step toward rate modernization. Staff believes an interim step is necessary because Staff has struggled to gather sufficient information from Ameren Missouri for rate modernization. Staff does not

[41] Exhibit 136, Lange Direct, page 17.
[42] Exhibit 136, Lange Direct, pages 20-21.
[43] Exhibit 36, Hickman Rebuttal, page 15, and Exhibit 136, Lange Direct, pages 21.
[44] Transcript, page 409.

know the totality of what information exists and believes a workshop (working docket) where information is exchanged would be productive. [45]

25. As an alternative to Staff's CCOSS allocation, Staff supports as reasonable an equal percentage increase to all classes other than Company-owned lighting. [46] Staff Witness, Sarah Lange, indicated that Staff would not oppose postponing rate modernization to the Company's next rate case, if the Commission ordered Ameren Missouri to retain and provide the minimum information Staff believes is necessary for rate modernization. [47]

26. Public Counsel also supports an equal increase for all classes with the exception of Company owned lighting. [48]

27. MECG's witness Steve Chriss supports using the 4NCP A&E allocation method as a reasonable allocation method. [49] Chriss suggests that Ameren Missouri's CCOSS does not comply with the requirements of Section 393.1620.1(1) RSMo because the 4NCP in the 4NCP A&E should be determined using the four months with the highest system peak loads. Chriss testifies that Ameren Missouri's 4NCP used different months depending on class. Chriss's modification of Ameren Missouri's CCOSS uses the four highest system peak load months. [50]

28. MIEC's witness Maurice Brubaker used Ameren Missouri's CCOSS as a starting point and modified a few allocations. [51] MIEC's CCOSS was not based on a

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[45] Transcript, page 409-412. Staff's use of workshop here does not refer to the non-residential rate design docket, but a workshop including all rate structures and classes.
[46] Exhibit 137, Lange Rebuttal, page 53, Footnote 9.
[47] Transcript, pages 418-419.
[48] Transcript, page 343.
[49] Exhibit 400, Chriss Direct, pages 3-4.
[50] Exhibit 400, Chriss Direct, page 18.
[51] Exhibit 36, Hickman Rebuttal, page 3.

particular revenue requirement, but was revenue neutral.[52] Brubaker disagrees with Ameren Missouri's treatment of non-labor component of production non-fuel O&M. Ameren Missouri allocates a larger proportion of non-fuel production O&M expense to energy than Brubaker. Because these expenses are more a function of the existence of generation facilities and the passage of time, he allocated them as a demand-related cost. Another change from Ameren Missouri's CCOSS is that Brubaker calculated taxes at the current rate based upon the taxable income of each class. He states that this alteration reduces the costs charged to the Residential class and increases the rate of return from the Residential class.[53]

29. CCOSSs serve as a guide for setting class revenue requirements, but should not be strictly relied upon for establishing each individual class's revenue requirements. CCOSSs are not precise, and are not updated for changes from the studied revenue requirement ($316 million) and billing determinants.[54] CCOSSs do not account for the settled revenue requirement ($140 million) and ordered billing determinants.

30. Staff testified that a utility's physical characteristics and accessible data fluctuate, and accordingly, the Commission hardly ever approves a particular allocation method because the appropriate method can vary from rate case to rate case.[55] If the revenue requirement is evenly distributed across the rate classes a CCOSS is not necessary.[56]

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[52] Transcript, page 369.
[53] Exhibit 350, Brubaker Direct, page 3.
[54] Exhibit 136, Lange Direct, page 27.
[55] Exhibit 136, Lange Direct, page 20.
[56] Transcript, page 373.

30. Outside of a CCOSS, other considerations exist to guide setting class revenue requirements. Policy considerations like rate continuity, rate stability, revenue stability, and minimizing rate shock are useful for setting class revenue responsibilities.[57]

31. The Company-owned lighting class is paying rates above its rate of return on base rate cost of service. The Customer owned lighting class is paying rates below its class cost of service. To avoid potential rate shock, Ameren Missouri is not proposing to adjust each lighting class to an equal return. Instead, Ameren Missouri proposes small adjustments over time to gradually align the two classes with their respective costs of service. This smaller revenue neutral shift toward cost of service for both lighting classes is what the Commission ordered in Ameren Missouri's last rate case.[58] The Company proposes a small incremental of $60,000[59] revenue neutral shift for the lighting classes. Customer owned lighting would be increased by $60,000 and Company owned lighting would decrease $60,000.

32. As an alternative to a $60,000 revenue neutral shift, Staff proposes that, based upon the results of Ameren Missouri's CCOSS, it would be reasonable to hold the Company's lighting class revenue requirement constant, and to apply an equal percent increase to the revenue requirements of all other classes including customer owned lighting.[60]

33. The two complete CCOSSs prepared in this case are very different. Ameren Missouri's CCOSS shows the Residential and SGS customers pay below target rates of

[57] Exhibit 136, Lange Direct, page 27.
[58] Exhibit 32, Harding Direct, page 7-8.
[59] Exhibit 32, Harding Direct, Schedule MWH-D2.
[60] Exhibit 137, Lange Rebuttal, page 53.

return, while LPS customers pay above target rates of return. Staff's CCOSS, conversely, shows Residential and SGS customers pay close to target rates of return and LGS, SPS, and LPS customers pay below target rates of return. Both of these cannot be correct.[61]

34. Ameren Missouri's witness Steven Wills, MIEC's witness Maurice Brubaker, and MECG's witness Steve Chriss recommend postponing Staff's proposed changes to non-residential rate plans to a separate proceeding.[62]

35. Ameren Missouri says that without guidance from the Commission about which CCOSS should be used, any collaborative process concerning future rate design (such as the non-residential working docket) between the parties may become strained.[63]

36. Ameren Missouri has implemented Plant-In-Service-Accounting (PISA). A cost recovery mechanism to recover costs associated with the Company's capital expenditures between rate cases.[64]

Conclusions of Law:

N. Section 393.1620.2 RSMo states that the Commission must only consider CCOSS results that allocate production plant costs from nuclear and fossil power plants using the average and excess method, or one of the methods in the NARUC 1992 manual, to allocate an electrical corporation's total revenue requirement in a general rate case.

O. Section 393.130.3 RSMo, states;

> No ... electrical corporation ... shall make or grant any undue or unreasonable preference or advantage to any person, corporation or locality, or to any particular description of service in any respect whatsoever, or subject any particular person, corporation or locality or any particular

[61] Exhibit 36, Hickman Rebuttal, page 2.
[62] Exhibit 41, Wills Surrebuttal, page 23.
[63] Exhibit 41, Wills Surrebuttal, pages 24-25.
[64] Exhibit 12, Bulkley Direct, page 59.

> description of service to any undue or unreasonable prejudice or disadvantage in any respect whatsoever.

In interpreting that statute more than 90 years ago, the Missouri Supreme Court said: "[R]ates or charges to be valid must not be unjust, unreasonable, unjustly discriminatory, or unduly preferential."[65]

P. The Commission has much discretion in determining the theory or method it uses in determining rates[66] and can make pragmatic adjustments called for by particular circumstances.[67]

Q. Cost-allocation is a discretionary determination frequently delegated to an expert administrative agency such as the Commission. In that regard, the Missouri Court of Appeals quoted approvingly the United States Supreme Court as saying "[a]llocation of costs is not a matter for the slide-rule. It involves judgment on a myriad of facts. It has no claim to an exact science."[68]

R. For an electrical corporation that has elected PISA under Section 393.1400, RSMo, (as has Ameren Missouri) Section 393.1655.6, RSMo, provides that:

> If the difference between (a) the electrical corporation's class average overall rate at any point in time while this section applies to the electrical corporation, and (b) the electrical corporation's class average overall rate as of the date rates are set in the electrical corporation's most recent general rate proceeding concluded prior to the date the electrical corporation gave notice under subsection 5 of section 393.1400, reflects a compound annual growth rate of more than two percent for the large power service rate class, the class average overall rate shall increase by an amount so that the increase shall equal a compound annual growth rate of

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[65] *State ex rel. Laundry, Inc. v. Public Service Com'n* 34 S.W.2d 37, 44, 327 Mo. 93, 109 (Mo. 1931)
[66] *State ex rel. Public Counsel v. Public Service Com'n*, 274 S.W.3d 569, 586 (Mo. App. 2009).
[67] *State ex rel. U.S. Water/Lexington v. Missouri Public Service Com'n* 795 S.W.2d 593, 597 (Mo. App. 1990)
[68] *Spire Missouri, Inc. v. Missouri Public Service Com'n* 607 S.W.3d 759, 771 (Mo. App. 2020), *quoting National Ass'n of Greeting Card Publishers v. U.S. Postal Service*, 462 U.S. 810, 103 S.Ct 2727, 77 L.Ed. 2d 195 (1983). That decision was quoting an earlier United State Supreme Court decision, *Colorado Interstate Gas Co. v. Federal Power Commission,* 324 U.S. 581, 589, 65 S.Ct. 829, 833, 89 L.Ed. 1206 (1945).

two percent over such period for such large power service class, **with the reduced revenues arising from limiting the large power service class average overall rate increase to two percent to be allocated to all the electrical corporation's other customer classes through the application of a uniform percentage adjustment to the revenue requirement responsibility of all the other customer classes.** (Emphasis added)

This statute does not have any direct impact on this rate case because the cap it imposes has not yet been met. But it does mean that in a future rate case the Residential rate class, as well as Ameren Missouri's other rate classes, could be statutorily required to subsidize the Large Power Service class. It also means that the legislature has recognized that class cost of service decisions can be based on consideration of public policy interests rather than a strict mathematical calculation.

Decision:

The Commission finds none of the parties' CCOSSs suitable for setting rates that are just and reasonable in this rate case. The Commission finds Staff's concerns about Ameren Missouri's CCOSS credible. The Commission finds Staff's CCOSS insufficient for allocating class revenue responsibilities because Staff was unable to obtain the necessary information to complete more than an interim step toward its goal of rate modernization. MECG and MEIC's modifications to Ameren Missouri's CCOSS do not address the underlying problems with the CCOSS they modify. Accordingly, with the exception of the Company owned lighting class, to which no increase is applied, no rate class allocation adjustments are necessary. The Commission finds that the revenue increase settled in the Agreement should be allocated to all customer classes on an equal percentage basis.

This issue also asked which party's CCOSS to use as a starting point for the non-residential rate design working case agreed to by the parties in Ameren Missouri's last rate case, File No. ER-2021-0240. The Commission will not select a CCOSS to be a starting point to the non-residential working docket. The Commission does not find it appropriate to endorse a particular CCOSS methodology. The non-residential working docket should not be constrained to a particular rate design methodology. Instead, as addressed elsewhere in this order, that collaborative process is largely dependent on Ameren Missouri providing sufficient data and information to Staff and participants so an exploration of non-residential rate design is productive.

The Commission finds it reasonable to hold Company owned lighting rates constant and apply the revenue requirement as an equal percentage to all other classes.

Though the Commission did not find any party's CCOSS suitable for allocating Ameren Missouri's revenue requirement in this case, the Commission continues to believe that cost-based rates are appropriate. It also believes that this decision will result in rates that are not unduly prejudicial to members of any of Ameren Missouri's rate classes.

C. How should production costs be allocated among customer classes within a CCOSS?

D. How should distribution costs be allocated among customer classes within a CCOSs?

These issues are related and the Commission will address them together.

Findings of Fact:

There are no additional findings of fact for these issues.

Conclusions of Law: