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Issues:	Revenue Requirement
Witness:	Tyler Comings
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Sponsoring Party:	Sierra Club
Case No.:	ER-2024-0319
Date Testimony Prepared:	December 16, 2024

STATE OF MISSOURI

MISSOURI PUBLIC SERVICE COMMISSION

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust its Revenues for Electric Service	)))	File No. ER-2024-0319

Direct Testimony of Tyler Comings

On Behalf of Sierra Club

December 16, 2024

BEFORE THE

MISSOURI PUBLIC SERVICE COMMISSION

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust its Revenues for Electric Service	)))	File No. ER-2024-0319

AFFIDAVIT

Pursuant to Missouri Public Service Commission requirements I, Tyler Comings, hereby state:

1. My name is Tyler Comings and I am a Principal Economist at Applied Economics Clinic. My business address is 6 Liberty Sq., PBM 98162, Boston, Massachusetts 02109.

2. Attached hereto and made part hereof for all purposes is my Direct Testimony on behalf of Sierra Club, including exhibits, which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that based upon my personal knowledge, the facts stated in the Direct Testimony are true. In addition, my judgement is based on my professional experience, and the opinions and conclusions stated in the testimony are true, valid, and accurate.

Under penalty of perjury, I declare that the foregoing is true and correct to the best of my knowledge and belief.

Date: December 16, 2024

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Tyler Comings

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I. Introduction and Qualifications

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

A My name is Tyler Comings. I am a Principal Economist at Applied Economics Clinic. The business address is 6 Liberty Sq., PMB 98162, Boston, Massachusetts, 02109.

Q Please describe Applied Economics Clinic.

A The Applied Economics Clinic is a 501(c)(3) non-profit consulting group. Founded in February 2017, the Clinic provides expert testimony, analysis, modeling, policy briefs, and reports for public interest groups on the topics of energy, environment, consumer protection, and equity, while providing on-the-job training to a new generation of technical experts.

Q On whose behalf are you testifying in this case?

A I am testifying on behalf of Sierra Club.

Q Please summarize your work experience and educational background.

A I have 18 years of experience in economic research and consulting. At Applied Economics Clinic, I focus on energy system planning, costs of regulatory compliance, wholesale electricity markets, utility finance, and economic impact analyses. I have provided testimony on these topics in Arizona, Colorado, the District of Columbia, Hawaii, Indiana, Kentucky, Maryland, Michigan, Missouri, New Jersey, New Mexico, Ohio, Oklahoma, West Virginia, and Nova Scotia (Canada). I am also a Certified Rate of Return Analyst and member of the Society of Utility and Regulatory Financial Analysts.

I have provided expertise for many public-interest clients including: American Association of Retired Persons, Appalachian Regional Commission, Citizens Action Coalition of Indiana, City of Atlanta, Consumers Union, District of Columbia Office of the

People's Counsel, District of Columbia Government, Earthjustice, Energy Future Coalition, Hawaii Division of Consumer Advocacy, Illinois Attorney General, Maryland Office of the People's Counsel, Massachusetts Energy Efficiency Advisory Council, Massachusetts Division of Insurance, Michigan Agency for Energy, Montana Consumer Counsel, Mountain Association for Community Economic Development, Nevada State Office of Energy, New Jersey Division of Rate Counsel, New York State Energy Research and Development, Nova Scotia Utility and Review Board Counsel, Rhode Island Office of Energy Resources, Sierra Club, Southern Environmental Law Center, U.S. Department of Justice, Vermont Department of Public Service, West Virginia Consumer Advocate Division, and Wisconsin Department of Administration.

I was previously employed at Synapse Energy Economics, where I provided expert testimony and reports on coal plant economics and utility system planning. Prior to that, I performed research on consumer finance and behavioral economics at Ideas42 and conducted economic impact and benefit-cost analysis of energy and transportation investments at EDR Group (now EBP).

I hold a B.A. in Mathematics and Economics from Boston University and an M.A. in Economics from Tufts University.

My full resume is attached as Exhibit TC-1.

Q Have you previously testified before the Missouri Public Service Commission?

A Yes. I filed testimony on the economics of the Company's coal fleet in Ameren's last rate case (File No. ER-2022-0337). I also filed testimony on the prudence of Evergy's fuel costs (File Nos. EO-2020-0262 and EO-2020-0263).

Q Have you co-written comments that were filed before the Missouri Public Service Commission?

A Yes. I have co-written comments on integrated resource plans ("IRPs") filed before this Commission in File Nos. EO-2024-0154, EO-2024-0153, EO-2024-0020, EO-2023-0213, EO-2023-0212, EO-2022-0202, EO-2022-0201, EO-2021-0035, EO-2021-0036, EO-2021-0021, EO-2020-0262, EO-2020-0263, EO-2020-0280, and EO-2020-0281.

Q What is the purpose of your testimony?

A My testimony focuses on the economics of Ameren's coal fleet and its requested return on equity ("ROE"). First, I discuss the historical and projected performance of the Sioux coal units, as provided by the Company, to show that these units should be considered for earlier retirement. Second, I discuss how the Sioux and Labadie units are vulnerable to current and future regulations that could lead to a near-term retirement or retrofit decision. Finally, I address the Company's proposed 10.25 percent ROE by discussing the myriad flaws that lead to an overstatement of the cost of equity, and I provide an alternative recommendation.

Q Please summarize your findings and recommendations.

A Based on my review and analysis, I conclude that:

1. **The Sioux units are costly and unreliable; they should be considered for earlier retirement to save ratepayers money.** The Sioux units operate infrequently because they have had increasing production costs and high forced outages. Ameren also expects that the units will have higher forced (or unplanned) outages going forward. Despite this past and anticipated performance, the Company has continually delayed the retirement of the plant. In its 2021 IRP, Ameren selected a 2028 retirement date. Then, in its 2022 IRP Update, the

Company delayed the date to 2030. The retirement was delayed once again to 2032 in its 2023 IRP; and the most recent 2024 IRP Update kept that date fixed. But the Company could avoid capital and fixed costs in future test years—as well as energy market risk—at the Sioux units if it planned for a pre-2032 retirement. The Commission order in the last rate case directed Ameren to "identify avoidable capital investments when considering any early retirement of its Sioux and Labadie plants."[1] Despite modeling earlier retirement dates in its resources plans, however, Ameren has not done so.

2. The Labadie and Sioux units could require costly emission controls that lead to an earlier retirement decision. In 2023, the Labadie plant had the highest emissions of carbon dioxide ("CO_2") and sulfur dioxide ("SO_2") of any power plant in the U.S.; it was also the ninth-highest emitter of nitrogen oxides ("NOx").[2] Given its substantial emissions, the plant is at-risk of needing emission controls in the future. The U.S. Environmental Protection Agency's ("EPA's") greenhouse gas limits would require either: carbon capture and storage ("CCS"), co-firing with natural gas, or ceasing coal at Labadie before 2032. The Good Neighbor Plan, ozone standards, or Regional Haze could lead to expensive selective catalytic reduction ("SCR") controls at the Labadie and/or Sioux units to curb NOx emissions. Regional Haze compliance could also require additional SO_2 reductions. Finally, according to the EPA, Labadie would be required to reduce particulate

[1] Report and Order, File No. ER-2022-0337, June 14, 2023, p. 64.

[2] Energy Information Administration ("EIA"), Emissions by plant and by region, *available at:* https://www.eia.gov/electricity/data/emissions/.

matter emissions ("PM") through a re-build of its electrostatic precipitators ("ESPs") to comply with the Mercury and Air Toxics Standards ("MATS") which were finalized earlier this year. Ameren has not fully addressed these costs and risks in its past IRP analyses; but the plants indeed face myriad challenges. If Ameren models earlier retirement of any Labadie units in the future, then it should identify avoidable capital spending in subsequent rate cases.

3. **The Company's requested return on equity is too high.** The Company's requested 10.25 percent allowable ROE is too high for several reasons. First, the Company's justification that a high ROE is needed because of high inflation and high interest rates is not persuasive because long-term inflation expectations are low and the Federal Reserve has since decreased rates while projecting that it will continue to do so in the coming years. Second, the Company has overestimated the cost of equity by relying too heavily on future earnings projections and allowable returns on equity decided by regulatory commissions across the U.S.—both of which unfairly skew the proposed ROE higher. I find that, after incorporating more reasonable data metrics, and many of the same models used by the Company, a recommendation of between 9.25 and 9.5 percent is more reasonable. This recommendation balances fairness to ratepayers and the requirements of the Company's equity investors.

II. The Sioux Units are Costly and Unreliable and Should Be Considered for Earlier Retirement to Save Ratepayers Money.

Q What amount of capital costs is the Company spending or planning to spend at the Sioux plant?

A The test year capital spending in this case is $16.5 million.[3] Going forward, the Company is planning another $52.3 million in capital spending from 2025 through 2029.[4]

Q How have the Company's plans for Sioux's retirement changed in recent years?

A The Company has delayed the retirement of the plant twice. In its 2021 IRP, Ameren selected a 2028 retirement date. Then, in its 2022 IRP Update, the Company delayed the date to 2030. The retirement was delayed once again to 2032 in its 2023 IRP; and the most recent 2024 IRP Update kept that date fixed.

Q Did the Company's IRP analysis justify extending the retirement of Sioux to 2032?

A No. In its 2023 IRP analysis, the Company looked at Sioux retirement dates of 2028, 2030, and 2032 and ultimately chose the latest of those dates, despite evidence that 2028 was the best option. The Company justified this delay by saying that "Sioux 2032 retirement results in the lowest cost among the Sioux retirement options, albeit very slightly."[5] Indeed, the costs of retiring Sioux between the three dates were effectively identical.[6] But the Company also developed a "scorecard," where it rated the many risks of each portfolio, including

[3] Company response to Sierra Club Data Request 2-2, Attachment SIERRA_2-SC_002_2-Att-SC 002.2 Capital OM Project Over 1M- CONF. Sierra Club confirmed with Ameren that this spreadsheet is not confidential.

[4] Company response to Sierra Club Data Request 1-4, Attachment SIERRA_1-SC_001_4-Att-SC 001.4 Coal CapEx. Sierra Club confirmed with Ameren that this spreadsheet is not confidential.

[5] Ameren 2023 IRP, Chapter 9, p.30.

[6] Ameren 2023 IRP, Chapter 9, Appendix A, Table 9A.8.

financial risks, customer satisfaction, economic development, and resource diversity. The rankings of all portfolios in this scorecard show that the earlier the retirement of Sioux, the better the score. Retirement in 2028 scored a 4.2 while both 2030 retirement and 2032 retirement scored a 3.8.[7] The portfolio with a 2028 retirement outscored the 2030 and preferred plan (with 2032 retirement) options based on resource diversity and the rate impact.[8] Given these results, Ameren should have selected a 2028 Sioux retirement. As I explain further in my testimony, with earlier retirement the Company could also avoid future fixed costs—as well as energy market risk—at the Sioux units. Minimizing both of these risks is in the best interests of Ameren's ratepayers.

Q Is Sioux a reliable and competitive resource?

A No. The units operate at a low capacity factor—as shown in Figure 1 below. In 2020 and 2023, the units operated one-third of the time or less. This is caused by two main factors: 1) the units are unavailable due to forced outages; and 2) the units are becoming increasingly expensive to operate.

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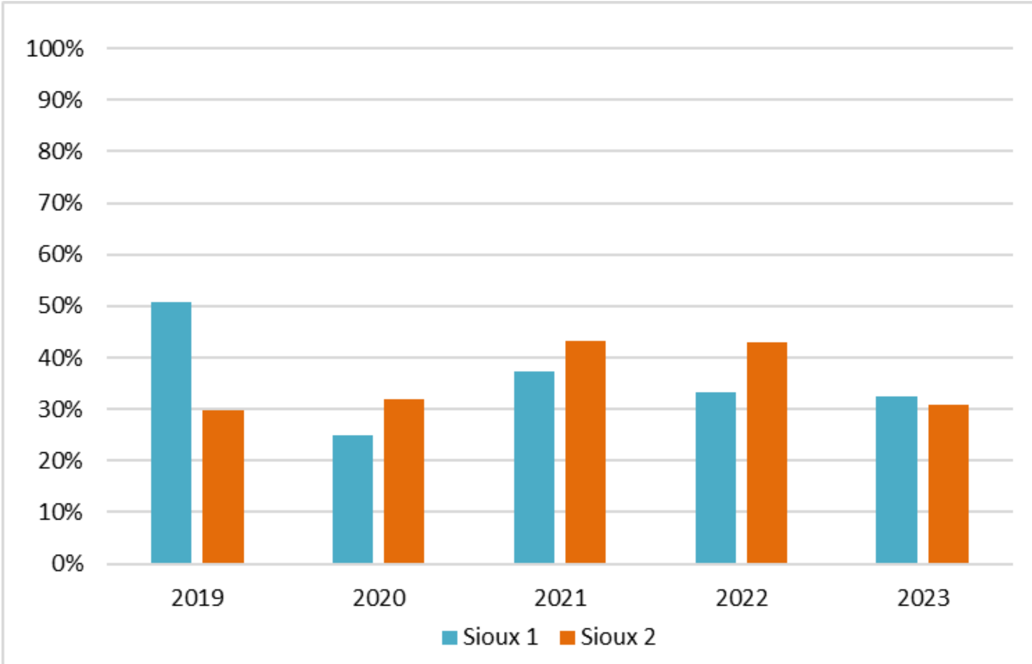
[7] Ameren 2023 IRP, Chapter 10, Appendix A, p.1.

[8] *Id.*

Figure 1: Sioux Capacity Factor[9]



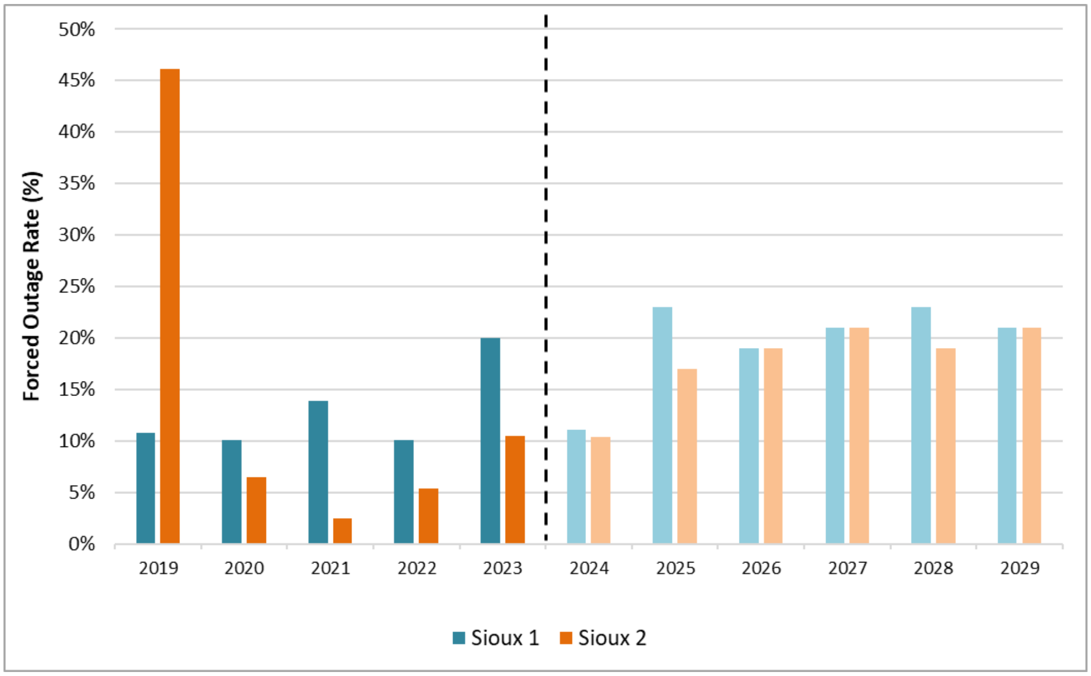
Q Are the units frequently unavailable?

A Yes. It is axiomatic that a unit cannot generate if it is unavailable; but it also means the unit is less reliable as a capacity resource. The two Sioux units have had high amounts of forced outages in the past; and, according to Ameren, the units are both expected to be unavailable for between 17 and 23 percent of the time between 2025 and 2029 (the latest data available), shown in Figure 2.[10] The availability of the units affects both the energy and capacity value of the units in several respects: 1) the energy value will decrease as availability decreases (i.e., outages increase) because the units cannot generate when unavailable; 2) the capacity value will decrease as availability decreases because the units are less dependable during peak hours.

[9] EIA. Form 860 and 923.

[10] Company response to Sierra Club Data Request 1-12, Attachment SIERRA_1-SC_001_12-Att-SC 1.12 - CONF.xlsx. Sierra Club confirmed with Ameren that the data this figure relies on is not confidential.

Figure 2: Forced Outage Rates for Sioux Units 1 and 2[11]

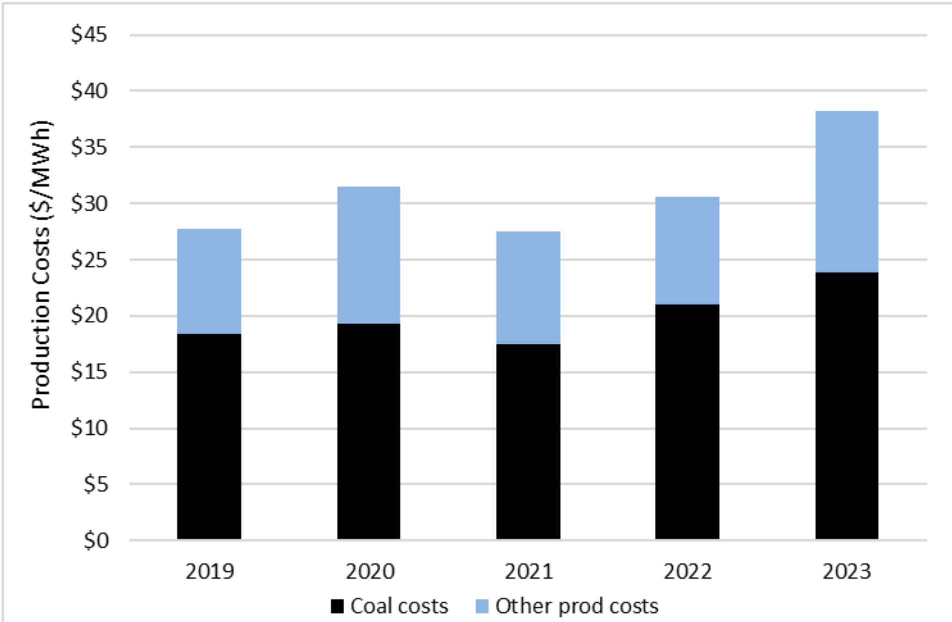


Q Have the production costs of the plant increased in recent years?

A Yes, the production costs, including fuel costs, have increased making it more expensive to operate the plant—as shown in Figure 3. Given these costs, even if the plant does not happen to be on a forced outage, it may not be dispatched or committed because it is too uncompetitive in the MISO market.

[11] Comings Workpaper – Company response to Sierra Club Data Request 1-11, Attachment SIERRA_1-SC_001_11-Att-SC 1.11; Company response to Sierra Club Data Request 1-12, Attachment SIERRA_1-SC_001_12-Att-SC 1.12 – CONF. Sierra Club confirmed with Ameren that the data this figure relies on is not confidential. The data for 2024 is a weighted average of reported data through July and projected data from August through December.

Figure 3: Sioux Production Costs ($/MWh)[12]



Q Is the Sioux plant vulnerable to energy market price risk?

A Yes. The plant requires market prices that are sufficient for it to operate in order to be economically viable. However, the addition of renewables and availability of low-cost gas-fired generation both suppress energy market prices. The amount of renewables on the system is only going to increase. Also, so far this year, gas prices have been down to $2 per MMBtu,[13] which is far below previous forecasts, including those being used by the Company. In its 2024 IRP update, the Company predicted a probability-weighted gas price

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[12] Company response to Sierra Club Data Request 1-11, Attachments SIERRA_1-SC_001_11-Att-SC 001.11 Attach AEEMO_GA19611 - C9 - 201912 CONF; SIERRA_1-SC_001_11-Att-SC 001.11 Attach AEEMO_GA19611 - C9 - 202012 CONF; SIERRA_1-SC_001_11-Att-SC 001.11 Attach AEEMO_GA19611 - C9 - 202112 CONF; SIERRA_1-SC_001_11-Att-SC 001.11 Attach AEEMO_GA19611 - C9 - 202212 CONF; SIERRA_1-SC_001_11-Att-SC 001.11 Attach AEEMO_GA19611 - C9 - 202312 CONF. Sierra Club confirmed with Ameren that the data this figure relies on is not confidential.

[13] *See* EIA, Henry Hub Natural Gas Spot Price, *available at:* https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm.

of more than double that for the year 2024.[14] Even the Company's low gas forecast for 2024 is well above actual prices this year. Therefore, Sioux is in a more precarious position than the Company anticipated in its IRP.

Q Are there additional pressures on Sioux that could lead to an earlier retirement?

A Yes. Another risk for Sioux is the need for SCR for compliance with ozone rules. In the next section, I discuss the regulatory pressures on both Sioux and Labadie.

Q Is the future of Sioux relevant to this rate case or future rate cases?

A Yes. Sioux's life should not be prolonged for reliability's sake, as it is expected to be frequently on forced outages and is subject to major environmental compliance risk. As I argued in the last rate case, the plans for its coal plants' futures are germane to rate cases because Ameren could avoid future capital spending and associated cost recovery at the units if there was potential for earlier retirement.

Q What do you recommend regarding the Sioux plant?

A The Commission order in the last rate case directed Ameren to "identify avoidable capital investments when considering any early retirement of its Sioux and Labadie plants."[15] In this current case, Sierra Club asked the Company to identify such avoidable costs; but despite modeling earlier retirement dates in its resources plans, Ameren could not provide such information. The Company stated that it evaluated "multiple retirement date scenarios" in its IRP but that it had not done a project-specific evaluation.[16] But the Company should conduct such analyses, per the Commission's order.

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[14] Ameren 2024 IRP Update, p. 43.

[15] Report and Order, File No. ER-2022-0337, June 14, 2023, p. 64.

[16] Company response to Sierra Club Data Request 1-4(c)(iii). Sierra Club confirmed with Ameren that this narrative response is not confidential.

III. The Sioux and Labadie Units Are At-Risk of Major Environmental Compliance Costs.

Q What amount of capital costs is the Company spending or planning to spend at the Labadie plant?

A The test year capital spending in this case is $14.9 million.[17] Going forward, the Company is planning another $748 million in capital spending from 2025 through 2029.[18]

Q What is the Company's current plan for the Labadie units?

A In the full 2020 triennial IRP, Ameren determined that Labadie units 1 and 2 would retire in 2042 and Labadie units 3 and 4 would retire in 2036; and this plan has not changed since then despite increasing regulatory pressures. As with the Sioux plant, Labadie's future is relevant to this case—and future rate cases—because the Company is assuming a protracted retirement when it invests in these units. If the Company were to take a fairer assessment of its units' viability, it could find that an earlier retirement is cost-effective and, therefore, take steps to avoid capital spending.

Q Are the Labadie units at-risk of needing substantial emission controls?

A Yes. Given its substantial emissions and the lack of state-of-the-art pollution controls, Labadie is seriously at-risk of requiring emission controls in the future to curb greenhouse gases and other pollutants. In 2023, the Labadie plant had the highest emissions of CO_2 (18.3 million tons) and SO_2 (39,220 tons) of any power plant in the U.S. Labadie was also

[17] Company response to Sierra Club Data Request 2-2, Attachment SIERRA_2-SC_002_2-Att-SC 002.2 Capital OM Project Over 1M- CONF. Sierra Club confirmed with Ameren that this spreadsheet is not confidential.

[18] Company response to Sierra Club Data Request 1-4, Attachment SIERRA_1-SC_001_4-Att-SC 001.4 Coal CapEx. Sierra Club confirmed with Ameren that this spreadsheet is not confidential.

the ninth-highest emitter of NOx (7,253 tons).[19] The Company has not taken a proactive stance to address these risks; instead, Ameren has historically taken a "wait and see" approach when it comes to regulatory compliance in its resource planning. That trend has continued in its most recent 2024 IRP Annual Update where the Company has not adequately addressed many of the key compliance costs that it may face. I walk through the various compliance risks below.

Q Please summarize the impact of EPA's greenhouse gas limits on Labadie.

A Under the final carbon rule, coal units that Ameren intends to operate beyond 2040, such as two Labadie units, must install CCS technology by 2032; coal units that Ameren commits to retire by 2040, such as the other two Labadie units, must rely on 40 percent co-firing with gas; and coal units that Ameren commits to retire by 2032 would not be subject to the 40 percent co-firing requirement.[20] Separately, any coal unit that fully converts to gas by 2030 would not be considered an existing coal unit for the purpose of these regulations. Thus, if the Company intends to run Labadie on coal after 2032, it would need to pursue one of the above options by 2030.

In its 2024 IRP Annual Update, the Company acknowledges these compliance pathways but has apparently not modeled the costs that any of them would entail; rather, it claims to monitor the legal challenges and "adjust its planning accordingly" when the time

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[19] EIA, Emissions by plant and by region, *available at:* https://www.eia.gov/electricity/data/emissions/.

[20] New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, Final Rule, 88 Fed. Reg. 39,798 (May 9, 2024). Table 1 in the Final Rule summarizes the compliance options for existing coal units. 89 Fed. Reg. at 39,841.

comes.[21] The Company also did not model these costs in its triennial 2023 IRP. If the Company plans to operate Labadie after 2039—as it plans currently for two Labadie units—it would require CCS, which the EPA estimates would be over $2,400 per kW (i.e., nearly $1.5 billion per unit at Labadie).[22] CCS operation also entails transportation and storage costs for captured carbon, and other additional operations and maintenance costs at the plant. Moreover, CCS results in significant heat rate and capacity penalties at the unit (i.e., the capacity of each unit could be reduced by as much as a third).[23] I understand that the greenhouse gas limits could change in future administrations; these rules have been relaxed and tightened in the past as administrations changed. Still, it is unlikely that Labadie will be able to continue to emit unrestricted levels of greenhouse gases into the 2040s.

Q Could Labadie and Sioux require selective catalytic reduction?

A Yes. Neither plant currently has SCR, which is the most effective control for NOx emissions. The Good Neighbor Plan, National Ambient Air Quality Standards ("NAAQS") for ozone, or Regional Haze could require these costly controls at the units to curb NOx emissions as a precursor to ozone. Under EPA's finalized Good Neighbor Rule, which is designed to protect against harmful ground-level smog pollution, each of the Labadie and Sioux units could be required to install SCR pollution controls. Indeed, the EPA's analysis

[21] Ameren 2024 IRP Update, p. 12.

[22] Docket No. EPA-HQ-OAR-2023-0072, TSD – GHG Mitigation Measures for Steam EGUs (Document No. EPA-HQ-OAR-2023-0072-0061_attachment_3), (May 29, 2023), *available at:* https://www.regulations.gov/document/EPA-HQ-OAR-2023-0072-0061.

[23] *Id.*

of the Good Neighbor Rule assumed that SCRs would be installed at all of the Labadie and Sioux units.[24]

In addition, EPA reclassified the St. Louis region's non-attainment area from "marginal" to "moderate" nonattainment due to a persistent failure to attain the 2015 ground-level ozone NAAQS.[25] This could require SCR for compliance as well. Moreover, as scientific understanding of the health harms caused by ground-level ozone have advanced, the ozone NAAQS limit has decreased multiple times: it was 80 ppb in 1997, 75 ppb in 2008, then 70 ppb in 2015—which is the latest limit in place. It is likely that future ozone limits will decrease in the medium- to long-term.

Finally, another potential driver of SCR would be Regional Haze Rule, which requires large sources of visibility-impairing pollution, like Ameren's Labadie and Sioux power plants, to reduce NOx and SO_2 emissions to ensure "reasonable progress" towards natural visibility in national parks and wilderness areas by 2064.[26]

Q Should the Company install SCR if they are required?

A Not necessarily. The substantial costs of SCR should lead to a re-evaluation of the units' futures. Retirement and replacement may be more cost-effective than continued investment in these units. Using assumptions from the U.S. Energy Information Administration

[24] EPA*, Good Neighbor Plan for 2015 Ozone NAAQS*, *available at:* https://www.epa.gov/Cross-State-Air-Pollution/good-neighbor-plan-2015-ozone-naaqs (see the following technical support documents: "Appendix A Final Rule State Emission Budget Calculations and Engineering Analytics" and "appendix-a-of-the-ozone-transport-policy-analysis-final-rule-tsd-for-the-federal-good-neighbor-plan").

[25] Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of Areas Classified as Marginal for the 2015 Ozone National Ambient Air Quality Standards, Final Rule, 87 Fed. Reg. 60,897 (Oct. 7, 2022). *See also* EPA, 8-Hour Ozone (2015) Designated Area/State Information, *available at:* https://www3.epa.gov/airquality/greenbook/jbtc.html.

[26] 42 U.S.C. § 7491(b)(2); *See generally* 40 C.F.R. § 51.308(d).

("EIA"), the capital costs of SCRs would be approximately $143 million per unit at Sioux or $286 million for the plant and $155 million per unit at Labadie or $621 million for the plant ($2022).[27] Despite these high costs and risks, Ameren is not addressing them adequately in its planning. In its 2024 IRP Annual Update, Ameren mentions that it will follow the legal challenges to the Good Neighbor Plan, admitting that "additional control technologies and/or reduced dispatch could be necessary as it was modeled and discussed in the 2023 IRP."[28] But the Company barely addressed the issue in that 2023 triennial IRP: only one of the 23 plans modeled in that IRP included any SCR costs, namely for two of the four units at Labadie.[29] The plan with SCR on two units cost roughly $700 million more than the preferred plan.[30] The Company has left the preferred plan in that 2023 triennial IRP unchanged, and has done no updated modeling in its 2024 IRP Annual Update.

Q Could Labadie require flue gas desulfurization ("FGD")?

A Yes. The plant currently lacks FGD, which is the most effective control for SO_2 emissions. EPA's Regional Haze Rule or an updated SO_2 NAAQS could drive the need for FGD controls at the plant.[31] Ameren's own analysis indicates that FGD technology at the Labadie units could cost between $409 and $446 million per unit ($2020).[32] But Ameren

[27] EIA, *Assumptions to the Annual Energy Outlook 2023: Electricity Market Module,* Table 8, p. 22, *available at:* https://www.eia.gov/outlooks/aeo/assumptions/pdf/EMM_Assumptions.pdf.

[28] Ameren 2024 IRP Update, p. 13.

[29] Ameren 2023 IRP, Chapter 9, p. 30.

[30] *Id.*, Chapter 9, Appendix A, Table 9A.8.

[31] *See* 42 U.S.C. § 7491(b)(2); 40 C.F.R. § 51.308.

[32] Ameren, *Response to Missouri Department of Natural Resources, Regional Haze Four-Factor Analysis*—Information Collection Request Dated July 29, 2020 for the Labadie Energy Center, at pdf p. 105, *available at:* https://dnr.mo.gov/document/missouri-regional-haze-plan-second-planning-period-appendix-c-1-c-7.

did not incorporate these costs into its recent IRPs. In its 2024 IRP Annual Update, the Company acknowledges the EPA's recent disapproval of Missouri's state implementation plan ("SIP") for Regional Haze;[33] however, it chooses again to not model the substantial investment that could be required. Given the magnitude of these costs, it is unlikely that the Company would continue to operate Labadie units if FGD were required.

Q Could Labadie require controls for particulate matter?

A Yes. There are two main drivers of future PM reduction at Labadie. First, in February 2024, the EPA lowered the NAAQS for PM2.5 from 12 to 9 micrograms per cubic meter.[34] Compliance with the limit is expected in 2032. Per the EPA's analysis, recent emissions data show that some of the St. Louis metro area (St. Clair and Madison Counties in Illinois) does not meet the standard; and projected 2032 PM emissions for Madison County, Illinois would still exceed this limit.[35] If the units required fabric filters to comply with this rule, the costs would be roughly $112 million per unit or $447 million plant-wide ($2022).[36] Second, as part of the Mercury and Air Toxics Standards (MATS), the EPA has finalized a more stringent limit of 0.01 lbs of filterable PM (fPM) per MMBtu—one third of the previous emission limit of 0.03 lbs per MMBtu. According to the EPA, Labadie will need

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[33] Ameren 2024 IRP Update, p.15.

[34] *See*, EPA, National Ambient Air Quality Standards (NAAQS) for PM, *available at* https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm.

[35] *See*, EPA, Fine Particle Concentrations for Counties with Monitors Based on Air Quality Data from 2020 – 2022, *available at:* https://www.epa.gov/system/files/documents/2024-02/table_annual-pm25-county-design-values-2020-2022-for-web.pdf; EPA, EPA Projects 52 Counties would not Meet the Strengthened Standard in 2032, *available at:* https://www.epa.gov/system/files/documents/2024-02/projected-county-list-2032-for-web.pdf.

[36] EIA, *Assumptions to the Annual Energy Outlook 2023: Electricity Market Module,* Table 8, p. 22, *available at:* https://www.eia.gov/outlooks/aeo/assumptions/pdf/EMM_Assumptions.pdf.

rebuilt ESPs to comply with the new standard.[37] Using EPA's cost assumptions, a new ESP rebuild would be $190 million in capital costs ($80 per kW) for the plant in order to comply with the proposed limit.[38]

In its 2024 IRP Annual Update, Ameren mentions the non-attainment of PM NAAQS in the St. Louis area that would lead to required reductions in PM and "precursors (NO_x/SO_2)" by 2027 but, again, apparently has not included any of these costs in its IRP modeling. The Company also shows that there is a 2028 MATS compliance date but does not discuss the costs associated with the rule. These PM compliance costs represent another large risk of keeping Labadie on-line that Ameren is not fully addressing in its resource planning.

In this current rate case, however, the Company provided a projection of capital spending for $322 million for MATS between 2025 and 2029.[39] It is unclear what these costs entail because when asked if the Company had evaluated future environmental compliance costs (including MATS), it answered the following:

> No; Ameren Missouri is aware of and has been reviewing the many new environmental rules recently promulgated by the federal Environmental Protection Agency (EPA). Because these rules are extremely lengthy, complex, and numerous, it is taking quite some time to review the rules and relate the requirements or potential requirements to Ameren Missouri's operations. It is also important to note that most, if not all, of

[37] 2024 Update to the 2023 Proposed Technology Review for the Coal- and Oil-Fired EGU Source Category Memorandum (2024 Technical Memo), Attachment 1 to the 2024 Technical Memo, EPA-HQ-OAR-2018-0794-6919_attachment_1, *available at:* https://www.regulations.gov/document/EPA-HQ-OAR-2018-0794-6919.

[38] *Id.*, Table 1.

[39] Company response to Sierra Club Data Request 1-4, Attachment SIERRA_1-SC_001_4-Att-SC 001.4 Coal CapEx. Sierra Club confirmed with Ameren that this spreadsheet is not confidential.

> these rules have been challenged judicially and Ameren Missouri continues to watch these cases for the final outcomes.[40]

When asked in the 2023 IRP case about MATS compliance and PM control costs, the Company answered that it was "determining if additional compliance measures will be necessary" and could not provide any estimates of PM emission controls.[41] Thus if, as it appears, the Company is assuming that it will spend major MATS compliance costs that will go into future rate cases but not in its IRP planning, this represents a clear inconsistency. Ameren needs to evaluate whether these MATS costs (and other compliance costs) are cost-effective as part of its resource planning before planning spending that will make it into rates.

Q Please summarize your assessment of the Sioux plant's future.

A The Sioux plant has fared poorly on the energy market because it is increasingly expensive and often on a forced outage, and these outages are expected to increase. Due to its high production costs, the plant is particularly vulnerable to low gas prices, which have been lower than previous expectations so far this year. The Company's continual delay of the plant's retirement—from 2028 to 2030 to 2032—have also left it more vulnerable to environmental compliance costs, namely the possibility that an SCR will be required to reduce NOx emissions. The Company should consider retiring the plant sooner given these myriad risks.

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[40] Company response to Sierra Club Data Request 1-9.

[41] Ameren IRP, Chapter 5, p.12; Sierra Club Comments in Ameren 2023 IRP, p. 10 (footnote 18).

Q Please summarize your assessment of the Labadie plant's future.

A The Company's plan to operate Labadie for the better part of two more decades carries substantial risk to ratepayers. The Company is taking the approach of waiting until compliance is undoubtedly required before it fully incorporates them in its resource planning. This approach is not adequate because it foregoes the potential savings of retirement and replacement in anticipation of these costs and risks. This matters for future rate cases because planned capital spending should change with the units' retirement year(s). Even the consideration of earlier retirement should lead to a re-evaluation of capital spending. That is because some planned spending may either be no longer necessary or no longer cost-effective with a shorter resource life. Moreover, it is critical if the Company is planning on including major spending in rates despite lack of an economic evaluation in its resource planning. The plant could require CCS, SCR, FGD, fabric filters, and/or electrostatic precipitator rebuild. Each of these projects would be in the hundreds of millions—CCS would be in the billions. The Company simply cannot continue to be overly optimistic about the plant's future in the face of these significant costs.

Q Should Ameren's capital investment decisions consider the potential for earlier retirement?

A Yes. In the last rate case, I proposed a framework for the Company to identify "avoidable" costs at the units if it was considering an earlier retirement. The Commission agreed with this framework, directing Ameren to: "identify avoidable capital investments when considering any early retirement of its Sioux and Labadie plants."[42] Since the last rate case, the Company has not changed the official retirement dates for Labadie and prolonged

[42] Report and Order, File No. ER-2022-0337, June 14, 2023, p. 64.

Sioux's retirement by another two years. However, the last IRP modeling Ameren conducted *did consider* portfolios with Sioux retiring in 2028 and 2030, as well as Labadie retiring in 2031, 2036, or 2039.[43] But, as I discussed previously, the Company did not evaluate if any capital costs would be avoidable with earlier retirement, despite the Commission order.[44]

I have outlined the many risks and costs that these units face. If the Company considered the full breadth of risks and costs, then it is likely that earlier retirement of some of the units would be cost-effective. If Ameren models earlier retirement of any Labadie units in the future, then it should identify avoidable capital spending in subsequent rate cases. This in turn should compel Ameren to consider whether some capital spending could be avoided, and the Commission could disallow those costs, unless the Company shows that early retirement is not advantageous—assuming all reasonable, future compliance costs are incorporated. My concern for ratepayers is if avoidable costs are incurred and allowed in rates, but the Company subsequently decides to retire the units earlier than currently planned, then ratepayers will not realize savings from avoiding that spending in the first place.

[43] Ameren 2023 IRP, Chapter 9, Appendix A, p. 59.

[44] Company response to Sierra Club Data Request 1-4(c)(iii).

IV. The Company's Return on Equity Request is Too High

Q Please explain the importance of the allowable return on equity and its relationship to the cost of equity.

A The "cost of capital" for a firm is an estimate of the cost of obtaining the capital required to fund that firm's operations and maintain financial strength. Firms that require substantial, upfront capital acquire it through the issuance of debt (in the form of bonds) or equity (in the form of shares). Bondholders and shareholders provide an infusion of capital to the firm, but they require returns on their bonds and shares that are commensurate with the underlying risks, respectively. The firm's "cost of capital" is the fair and reasonable level of return at which investors would provide sufficient capital—thus it is composed of the "cost of debt" and the "cost of equity." There is historical precedent for regulated firms to recover these costs in rates.

Two seminal cases on the inclusion of cost of capital in what regulated firms charge customers include Bluefield Water Works and Hope Natural Gas Company. In *Bluefield Water Works Imp. Co. v. Public Service Commission*, the U.S. Supreme Court ruled that Bluefield Water Works was allowed to earn a "return on the value of property it employs for the convenience of the public"[45] and that such a return:

> …should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain its credit and enable it to raise the money necessary for the proper discharge of its public duties.[46]

In *Federal Power Commission v. Hope Gas and Electric*, the U.S. Supreme Court ruled

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[45] *Bluefield Water Works v. Public Service Comm'n*, 262 U.S. 679, 693 (1923). *Available at:* https://supreme.justia.com/cases/federal/us/262/679/.

[46] *Id.*

that rates should be set to allow the company to "operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed."[47]

The allowable ROE is an attempt to capture the cost of equity, which is the return that a firm needs to offer its shareholders to attract sufficient equity capital. The allowable ROE is set so that the Company does not over-earn—thus balancing the interest of ratepayers—but importantly it is not necessarily equal to the cost of equity capital because the latter is unknown. The unknowability of the cost of equity necessitates using multiple methods, historical and projected data, and judgment in developing an estimate with which to set an allowable ROE. (Both measures are different than the <u>actual</u> ROE that a Company earns and which is reported to investors after the fact and easily measurable.)

Q Please summarize the Company's rationale for increasing the allowable ROE in this case.

A The Company is proposing an allowable ROE of 10.25 percent in this case. Company Witness Ann Bulkley cites many factors leading to the requested increase, including the changes in capital markets such as trends in inflation and interest rates since the last rate case. She also conducts several models to estimate the cost of equity capital, presenting a range between 10.25 and 11.25 percent and ultimately concluding with the 10.25 percent recommendation that the Company has incorporated in its rate request.

[47] *FPC v. Hope Nat. Gas Co.*, 320 U.S. 591, 605 (1944). *Available at:* https://supreme.justia.com/cases/federal/us/320/591/.

Q Do you agree with the proposed increase of the allowable ROE?

A No. The Company's requested ROE is too high, as I discuss in detail in this section. First, the outlook for the U.S. economy has changed since the Company prepared its testimony. The Company painted a picture of continued high inflation and high interest rates, but both have since decreased and expectations for long-term inflation remain low. I also find many flaws with the methodology used to develop the cost of equity estimate which led to an overestimate. I discuss how the Company's discounted cash flow ("DCF") growth rate is upwardly biased and that the Company overstates the "equity risk premium" used in the capital asset pricing model ("CAPM"). While I do not take issue with the usage of the DCF or CAPM models themselves—only how they were carried out in practice by Ameren—I disagree with the risk premium model as it is an invalid method.

Q Do you recommend a different ROE for Ameren?

A Yes, I developed my own recommended cost of equity of between 9.25 and 9.50 percent. This recommendation is based on employing several estimation methods including the DCF, CAPM, and ECAPM used by the Company. Using these methods, however, is not sufficient to develop a robust and reasonable cost of equity—and by extension allowable ROE. There are many decisions about how to carry out these methods, including what data to incorporate, that influence the outcome. I used more reasonable data assumptions than the Company, which led to a more reasonable ROE recommendation—as I will show in detail below.

A. The U.S. Economic Outlook Has Changed Since Ameren Filed its Testimony

Q Does the Company point to the U.S. economic outlook as a reason to increase the ROE?

A Yes. Witness Bulkley claims that the cost of equity is "directionally higher" than what was set in the last rate case because of current and expected monetary policy, as managed by the Federal Reserve ("the Fed")—namely through high interest rates set by the Fed to address high inflation.[48] Witness Bulkley further asserts that high inflation rates are likely to persist and that the Federal Open Market Committee was likely to keep federal funds rates higher to reduce inflation.[49] This leads her to conclude that an interest rate cut is not expected in the near term.

Q Is the Company's economic outlook now outdated due to recent market changes?

A Yes. The Company is not justified in asking for a ROE increase due to changing economic conditions. Ms. Bulkley's assessment was based on economic data and forecasts available at the time of her analysis, but that data has undergone changes in recent months leading to a more favorable economic outlook. Most notably, year-on-year inflation has slightly decreased in recent months: Between June and October 2024 one measure of annual inflation—the Consumer Price Index ("CPI")—decreased from 3.0 percent to 2.6 percent;[50] another measure, the Personal Consumption Expenditures ("PCE") index

[48] Bulkley Direct at p. 28:2.

[49] Bulkley Direct at p. 17:8-9.

[50] *See* U.S. Department of Labor, Bureau of Labor Statistics News Release, *Consumer Price Index – October 2024, available at:* https://www.bls.gov/news.release/pdf/cpi.pdf.

decreased from 2.4 percent to 2.3 percent between June and October.[51] The latter is the Fed's preferred inflation measurement where it seeks a 2 percent target value.[52]

The Fed has a dual mandate to address inflation and attempt to achieve "full employment." This presents a constant trade-off in that the Fed wants to promote economic growth to lower unemployment, but high growth can lead to inflation which is generally detrimental to consumers and businesses. Interest rates that are too low can spur high inflation, while rates that are too high will temper inflation but stifle economic growth. The recent downward trend and stabilization of inflation, coupled with slight increases in unemployment rate, led the Fed to lean more towards promoting economic growth by cutting interest rates in the last two meetings—September 18, 2024 and November 7, 2024.[53] The Fed rate has decreased by 0.75 percent since early September, which is contrary to Ms. Bulkley's claim that a "near term rate cut" was not likely at the time of her testimony filing.[54]

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[51] *See* U.S. Department of Commerce, Bureau of Economic Analysis News Release, *Personal Income and Outlays, October 2024, available at*: https://www.bea.gov/news/2024/personal-income-and-outlays-october-2024. Latest data available as of November 26, 2024.

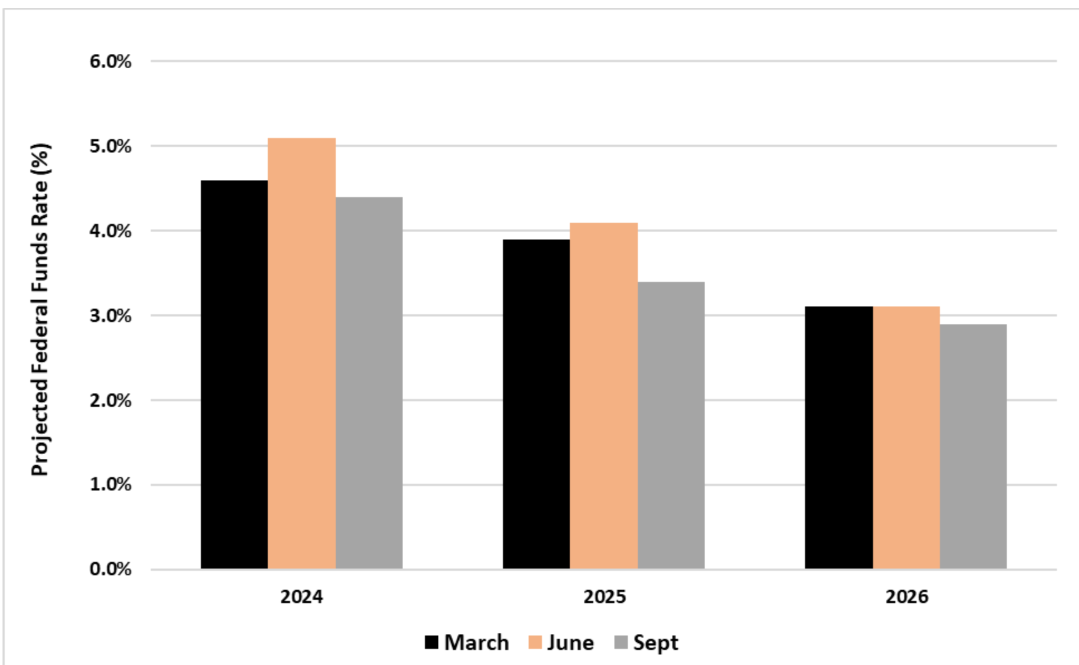
[52] *See* Board of Governors of the Federal Reserve System, Economy at a Glance – Inflation (PCE), *Personal Consumption Expenditures Price Index: Percent Change from year Earlier*, *available at:* https://www.federalreserve.gov/economy-at-a-glance-inflation-pce.htm#:~:text=The%20Federal%20Reserve%20seeks%20to,personal%20consumption%20expenditures%20(PCE).

[53] Board of Governors of the Federal Reserve System, "Federal Reserve issues FOMC statement," (Sept. 18, 2024) *available at:* https://www.federalreserve.gov/newsevents/pressreleases/monetary20240918a.htm; https://www.federalreserve.gov/monetarypolicy/files/monetary20241107a1.pdf.

[54] Bulkley Direct at p. 27:12.

The Fed's own outlook changed as inflation decreased and new monthly jobs added were low in the summer of 2024.[55] In the September Federal Open Market Committee (FOMC) meeting, inflation in 2025 was projected to be very slightly lower than what was projected for 2025 in the June meeting; with 2026 inflation expected to hit the Fed's target of 2 percent in both meetings. But given the changing economic conditions, including annual inflation decreasing since June, the Fed predicted that it could afford to decrease rates more quickly and still achieve lower inflation—as shown below in Figure 4.

Figure 4: Federal Reserve Projected Annual Federal Funds Rate (by month of projection in 2024)[56]



[55] *See* Board of Governors of the Federal Reserve System, "Federal Reserve issues FOMC statement," (Sept. 18, 2024), *available at:* https://www.federalreserve.gov/newsevents/pressreleases/monetary20240918a.htm.

[56] Federal Reserve, Federal Reserve Summary of Economic Projections, March 2024, *available at:* https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20240320.pdf; Federal Reserve Summary of Economic Projections, June 2024, *available at:* https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20240612.htm; Federal Reserve Summary of Economic Projections, September 2024, *available at:* https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20240918.pdf.

I do not possess a crystal ball, and I do not expect Ms. Bulkley to predict the future either. I am simply pointing out that the economic outlook presented in her testimony is now outdated and has shifted significantly since then. Not only did the Fed funds rate decrease twice in recent months, but expectations are that the Fed will continue to decrease rates in the coming months. The prevailing wisdom in early 2024 was that the Fed was going to need to maintain high interest rates in order to tame inflation; but that view has since shifted with the Fed ramping down interest rates and expected to gradually decrease rates in upcoming meetings. For instance, the CME's Fed Watch estimates the probability of future Fed funds rates: As of November 27, 2024, this service was projecting three more rate cuts in the next year—with the most likely rate being 3.75 to 4 percent at the end of 2025—another 0.75 percent lower than today's Fed rate.[57]

Q Does the market expect high inflation in the long-term?

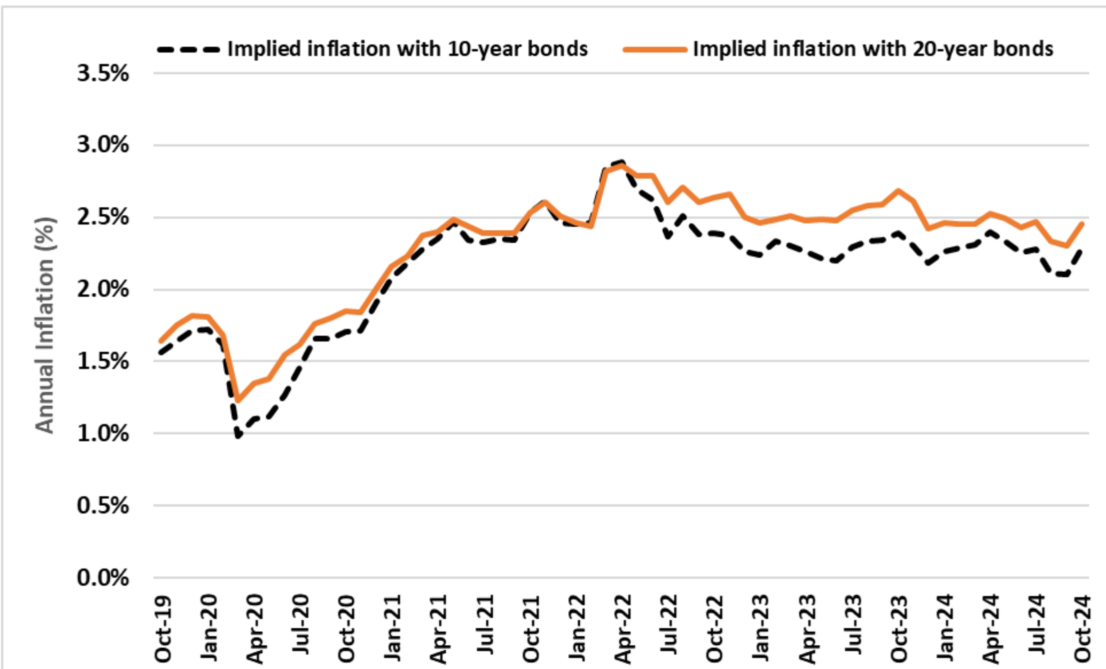
A No. Witness Bulkley claimed that high inflation levels were likely to persist.[58] However, as I have discussed, the inflation rates have come down recently. In addition, the *expectations* for inflation are also low. One valuable measure of inflation expectations is to look at the yields on Treasury bonds that include "inflation protection" (these are called TIPS) versus those that do not offer protection. The difference between these two rates is the implied inflation expectation over the term of the bond, for example, 10 years or 20 years.

[57] *See* CME Group, FedWatch Tool, *available at:* https://www.cmegroup.com/markets/interest-rates/cme-fedwatch-tool.html.

[58] Bulkley Direct at p. 18:9-10.

Figure 5 shows the implied inflation rate based on 10- and 20- year treasury bonds. As of October 2024, the implied inflation rate for the 10-year treasury bond is roughly 2.3 percent with the 20-year bond at 2.5 percent. While the implied inflation rates for the 10- and 20-year treasury bonds remain above 2.0 percent, they have been mostly trending downward since early 2022.

Figure 5: Implied Inflation from TIPS vs Non-TIPS Bond Rates



Q Did the Company also claim that utility stocks would "underperform"?

A Yes. Ms. Bulkley stated that as a result of higher interest rates, that utility stocks should be expected to underperform.[59] This would indicate that investors were cooling on purchasing utility stock. But more up-to-date information contradicts this claim. In fact, the stock prices of utilities in Ms. Bulkley's proxy group have increased by an average of 13 percent

[59] Bulkley Direct at p. 9.

since her testimony was written.[60] The utility industry has fared better than the overall market so far in 2024: The total return of the S&P utility index through November 22nd was 32 percent compared to 27 percent for the S&P 500 as a whole.[61] In October 2024, Morningstar said that "investors still can't get enough of utilities," showing that stocks in utilities have rallied since March of this year.[62] It also said that utility stocks will remain attractive because of accelerating demand growth.[63]

In short, utility stocks have performed well and are not struggling to attract investment. The Company claimed that "stock price underperformance for the utility sector indicates that the cost of equity has increased since the Company's last rate proceeding."[64] But the converse of this is now true: stock prices have increased recently, meaning that the cost of equity has decreased. Thus, the Company's depiction of struggling utility stocks that necessitate a higher ROE to attract investors is moot, as of this filing.

Q How should the Commission consider the economic outlook discussion presented in this case?

A I am writing this using recently available information. I recognize that my conclusions could change in the coming months as more data becomes available. But my assessment is

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60 30-day average stocks prices from October 1 to November 11, 2024 (from Yahoo Finance) compared to the 30-day average presented in Schedule AEB-D2, Attachment 3, p. 3.

61 *See* S&P 500 Utilities Overview, *available at:* https://www.spglobal.com/spdji/en/indices/equity/sp-500-utilities-sector/?currency=USD&returntype=T-#overview and https://www.spglobal.com/spdji/en/indices/equity/sp-500/?currency=USD&returntype=T-#overview. Data was pulled on November 25, 2024, return is through November 22, 2024 (year-to-date, total return).

62 Andrew Bischof and Travis Miller, Morningstar, "Utilities: Falling Interest Rates, Growth Outlook Boosting Stocks," *available at:* https://www.morningstar.com/stocks/utilities-falling-interest-rates-growth-outlook-boosting-stocks.

63 *Id.*

64 Bulkley Direct at p. 23:29-24:2.

more up-to-date than Ameren's filing, and points out significant changes that have occurred in the economy in recent months. Therefore, it should be given more weight than what the Company has presented. I do not fault Ameren for not identifying how the U.S. economic outlook would change after its testimony was filed; that would involve perfect foresight which is unreasonable to expect. But the Company's outdated outlook is still being used to justify an increase in the allowable ROE at this current time. I am, therefore, compelled to point out where that outlook has (so far) gone wrong and how expectations have markedly changed since Ameren's filing.

B. The Company's Discounted Cash Flow Estimate is Overstated by Relying too Heavily on Earnings Projections.

Q Please describe the discounted cash flow model.

A The DCF model is a widely used methodology in estimating the cost of equity. The DCF relies on the concept that the price an investor is willing to pay for a share of equity *today* is equal to the *discounted future* dividends that the shareholder expects to receive over the long term. The discount rate at which those future earnings equal the initial stock price is the cost of equity capital**.** This concept is shown in the formula below:

$$\mathrm{P} = D_0 + \frac{D_0(1+g)}{(1+k)} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^3}{(1+k)^3} + \cdots \frac{D_0(1+g)^n}{(1+k)^n}$$

Where $n = \infty$, P = stock price in year 0; D_0 = dividend paid in year 0; g = annual dividend growth rate; and k = discount rate or cost of equity

As the number of years of the equity investment approach infinity, this formula reduces down to the following:[65]

[65] This is referred to as the "Gordon Growth Model."

$$k = \frac{D_1}{P} + g$$

Thus, per the DCF method, the cost of equity ("k") is equal to dividend yield (equal to the next year's dividend divided by the current stock price) plus a growth rate ("g"). This derivation requires the assumption that the dividend payout rate (equal to the percentage of earnings that are paid in dividends—as opposed to retained), growth rate ("g") and cost of capital ("k") are all constant. The estimate of the growth rate term ("g") is where DCF estimates often diverge because it's left to the analyst's judgment as to what data to employ and over what timeframe. The goal of the analysis is to mimic the use of data that a typical investor would evaluate. This requires many data metrics, the selection of a proxy group of similar companies, and the usage of both historical and projected information.

Q Please summarize the Company's DCF estimate.

A As is common practice with this method, Witness Bulkley chose a proxy group of utilities using several criteria, including that the utilities owned generation in rate base, were mostly regulated operations, and had investment grade credit ratings (among other criteria).[66] To estimate the dividend yield component of the DCF ("D_1/P" shown above) she pulled data on the projected dividend (from Bloomberg) and divided it by the average stock price for each company going back 30, 90, and 180 days.[67] To estimate the DCF growth term ("g" shown above), she took the average of three forecasts of earnings per share ("EPS") from Value Line, Yahoo Finance, and Zacks for each company. The summation of the dividend

[66] Bulkley Direct at pp. 29-30.

[67] Schedule AEB-D2, Attachment 3, p.1-3.

yield and this growth term is calculated for each company, then took the median value from the group. She ultimately estimates a DCF range of 10.07 percent to 11.41 percent.[68]

Q Do you agree that only projected data be used in determining the DCF growth rate?

A No. Forecasts are helpful information but are almost always wrong. On the contrary, historical performance is known data and germane for evaluating future, long-term performance. This is why services that forecast earnings often provide historical earnings growth side-by-side—which is the case for all three earnings forecast sources used by Ms. Bulkley. Importantly, the forecasts themselves are also limited to the near term, they only project between three and five years in the future. Thus, these short-term forecasts should not be confused with the long-term growth expectation, which is what the DCF's "g" term represents. For all these reasons, a prospective investor is likely to review both historical and projected data, and I recommend the use of both in estimating the cost of equity.

Q Do you agree with only earnings to represent the DCF growth term?

A No. I use earnings growth in my own estimates, but as one metric among a suite of others—not as the primary driver of the DCF estimate. The DCF formula is a discounted value of future dividend payments—which are one component of earnings that are also forecast in the short-term by some investor services, like Value Line which is used by me and Ms. Bulkley. Book value growth is another important measure because it represents the value of shareholder equity on the company's balance sheet. All three measures—earnings, dividends, and book value—should be used in determining a growth rate; and the analyst should view both historical and forecasts of these measures.

[68] Schedule AEB-D2, Attachment 1.

Q Does the Value Line investor service used by you and Ms. Bulkley provide historical and forecasted data for all three measures?

A Yes. Value Line makes both backward- and forward-looking data on earnings, dividends, and book value readily available for each company that it covers. Each company-specific page includes a box that contains key measures including revenues, cash flow, earnings, dividends, and book value, and provides those growth rates for these measures over the past 10 years, past 5 years, and a near-term forecast.

Q Do you agree with Ms. Bulkley's usage of 90 and 180-day average stock prices?

A No. Recent stock prices are the best information available as they incorporate all recent data and have more updated expectations for the future. That is why the 30-day average stock price is a reasonable value to use, and what I rely upon in my own DCF estimate. Ms. Bulkley uses the 30-day, 90-day, and 180-day average and weighs them all equally in her estimate. Notably, when showing her calculations for each of those three stock price periods, the average DCF value is the lowest using the 30-day stock price and highest under the 180-day stock prices. The usage of stock prices going further back in time creates an inconsistency because it is being paired with more recent forecasts of the dividend (D_1) and future earnings per share, which is used for the "g" term. Thus, there is a mismatch regarding the timing of the data used in the Company's DCF calculation.

Q Please describe your DCF proxy group.

A I use a roughly similar process to Ms. Bulkley but end up with a slightly different proxy group of utilities. I started with the list of 37 electric utility holding companies that are covered by Value Line, which as I mentioned is a key investor source of historical and projected data. I screened out companies that had a recent or announced merger; those that did not have more than 60 percent of their revenue from regulated electric utility operations; and those that did not have significant rate-based generation. These characteristics are similar to criteria used by Ms. Bulkley. I also screened out companies that did not have increasing dividends in the past five years—as this establishes a stable pattern of growth. After these criteria, I concluded with 19 companies in the proxy group, as depicted below in Table 1. Fifteen of the 19 companies in my proxy group are also in the Company's proxy group.

Table 1: DCF Proxy Group

Company	**Ticker**
Ameren	AEE
American Electric Power	AEP
Avista Corp	AVA
CMS Energy Corp	CMS
Duke Energy	DUK
Edison International	EIX
Entergy Corp	ETR
Evergy, Inc.	EVRG
Idacorp, Inc.	IDA
Alliant Energy	LNT
MGE Energy	MGEE
Nextera Energy	NEE
Northwestern Energy	NWE
OGE Energy Corp	OGE
TXNM Energy, Inc.	TXNM
Pinnacle West	PNW
Portland General	POR
Southern Company	SO
Xcel Energy	XEL

Q What did you use for the dividend yield term?

A I used Value Line's projection of the dividend in the next 12 months from its Summary and Index survey from November 15, 2024. I also used the 30-day average stock price of each company in my proxy group from October 1 through November 11, 2024.

Q What did you use for the growth rate or "g" term?

A I performed two versions of DCF growth calculations—both an internal and external version. The internal growth method (sometimes called "sustainable growth") uses the retained earnings as well as expected growth in number of equity shares. This growth rate is calculated, shown below, as the percentage of earnings that are retained by the company ("b") multiplied by the return on equity ("r" or ROE) plus a share growth term (sv) where I use the current stock price, book value and historical and projected share growth:[69]

$$g = br + sv$$

This growth rate, along with the dividend yield, resulted in a DCF estimate of 8.35 percent (which is referred to as "DCF 1" elsewhere in my testimony). The values used in this DCF 1 estimate are shown in Exhibit TC-4

I also estimated an external growth DCF growth rate, whereby I took the average of historical and projected growth rates for dividends, earnings, and book value for my proxy group—as opposed to just the projected earnings used by Ms. Bulkley. For projected earnings, I used all of the same sources as Ms. Bulkley and took the average of three earnings growth sources (Value Line, Yahoo Finance, and Zacks). I weighed both the historical and projected rates equally, and the dividends, earnings, and book value metrics

[69] The "sv" term is calculated by taking percentage of share growth—based on the historical and projected common shares from Value Line—and multiplying that percentage by the market-to-book ratio minus one: (M/B)-1.

equally. The resulting DCF using this method was 8.87 percent, after removing outliers (referred to as "DCF 2").[70] The values used in this DCF 2 estimate are shown in Exhibit TC-4.

Q Please summarize your DCF estimates.

A I developed two estimates using many data sources to get robust estimates of the cost of capital under the DCF model. My final DCF estimates were 8.35 percent (DCF 1) and 8.87 percent (DCF 2). These are substantially lower than Witness Bulkley's range of DCF estimates which is 10.07 percent to 11.41 percent. The key difference in our estimates is that Ms. Bulkley relied on earnings growth forecasts for the long-term growth rate whereas I used historical and projected earnings, dividends, and book value.

Q You mentioned that your proxy group differed somewhat from Ms. Bulkley's—does that explain why your estimates are lower?

A No. I replicated my DCF calculations using Ms. Bulkley's proxy group and I arrived at even lower estimates of 8.0 percent (DCF 1) and 8.56 percent (DCF 2). Therefore, all else equal, my choice of proxy group actually <u>increases</u> the DCF relative to the Company's proxy group.

Q Does your usage of historical data, along with forecasts, lead to a lower DCF?

A Only slightly, I ran the DCF calculations using only projected data, as another illustrative exercise, and it resulted in estimates of 8.59 percent for DCF 1 and 9.0 percent for DCF 2—an average increase of 0.19 percent to my DCF estimates. Later in my testimony, when I discuss the CAPM model, I did a similar exercise and found that only using projected

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[70] I removed growth rates that were negative or above 20 percent which, if I had left in, would have decreased my DCF estimate to 8.77 percent.

data actually decreased my CAPM estimates. Across all models I used, relying only on projected data decreased the average cost of capital by 0.06 percent.

C. The Company's Capital Asset Pricing Model Overstates the Equity Risk Premium.

Q Please describe the capital asset pricing model.

A Witness Bulkley also uses the CAPM and ECAPM models. These models address two important concepts: 1) that investments in equity are not "risk-free" investments, therefore equity investors expect a higher return; and 2) that equity investors expect varying return for equity investments of varying risk. The additional return for equity investments, compared to risk-free investments, is what defines the "market risk premium" (sometimes referred to as the "equity risk premium"). The future premium is unknown but needs to be estimated for this model. The relative risk of different types of equity investments is measured in a company's "beta," which is measured by the variance in that company's stock price relative to the equity market at-large (e.g., the S&P 500). A beta of less than one indicates that investment in that company is relatively less risky than the equity market at-large, and that investors in that company should expect a lower return commensurate with lower risk. Conversely, a beta greater than one indicates a riskier venture for which investors should expect a higher return commensurate with that higher risk.

The formula for the CAPM employs a risk-free rate (R_{rf}), market risk premium ($R_m - R_{rf}$) and beta (β) term:

$$\mathrm{k} = R_{rf} + \beta * (R_m - R_{rf})$$

The empirical CAPM ("ECAPM") formula is a variation of the CAPM that produces a higher value if the beta of the industry or company is less than one:

$$k = R_{rf} + .75 * \beta * (R_m - R_{rf}) + .25 * (R_m - R_{rf})$$

The risk-free rate used in the CAPM and ECAPM is typically a current Treasury bond yield as this is seen by investors as having little-to-no risk. The market risk premium can be estimated using historical returns on stocks compared to Treasury yields, using consistent Treasury maturities for both historical and current yields. For instance, if one uses a 20-year Treasury rate for the current risk-free rate (R_{rf}) then the market risk premium should be estimated as the difference between return on stocks and 20-year Treasuries.

Q Does Witness Bulkley overestimate the equity risk premium and by extension the CAPM and ECAPM values?

A Yes. Witness Bulkley's CAPM values range from 10.59 to 12.05 percent, and her ECAPM estimates range from 11.07 to 12.17 percent.[71] These high estimates are driven by her estimated equity risk premium of between 7.86 and 8.21 percent, which is higher than the historical premium and forward-looking estimates (which, as discussed below, typically range between 5 and 6 percent). Ms. Bulkley again relies on short-term projected earnings by essentially calculating a DCF of a large group of companies using the Value Line forecast to estimate the equity risk premium. I have already discussed why reliance on earnings projections alone is ill-advised. Once again, the historical data should be considered rather than ignored—and dividend and book value growth should also be considered. A savvy investor is unlikely to rely on short-term projections of earnings alone when trying to determine a long-term growth rate.

There are publicly available measures that one can review to evaluate the equity risk premium—and currently the values of these measures are close to one another. First,

[71] Bulkley Direct at p. 45.

the long-term historical returns of the equity market compared to that of 10-year Treasury bonds is 5.23 percent or 6.80 percent (depending on use of the geometric or arithmetic average, respectively).[72] Second, Kroll (formerly Duff and Phelps), an investor data and forecast service, periodically issues an equity risk premium recommendation to investors.[73] Its most recent equity risk premium recommendation was 5.0 percent on 20-year Treasury bonds. Going back to 2008, this recommendation has always been between 5 and 6 percent (inclusive).[74]

Q Did you calculate CAPM and ECAPM values?

A Yes. When calculating the CAPM or ECAPM value the risk-free rate and the equity premium must be based on internally-consistent bond maturity. I used two different methods: 1) the average historical premium on 10-year bonds, along with the current 10-year risk-free rate; and 2) the Kroll recommendation of the 5.0 percent risk premium on 20-year bonds, along with the current 20-year risk-free rate.[75] The Treasury bond rates were based on the 30-day average from October 1 through November 13, 2024: 4.16

[72] *See* Damodaran Online Data, *available at:* https://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html.

[73] *See* Kroll Cost of Capital Resource Center, Kroll Recommended U.S. Equity Risk Premium and Corresponding Risk-Free Rates to be Used in Computing Cost of Capital: January 2008 – Present, (June 5, 2024), *available at:* https://www.kroll.com/en/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates.

[74] *See* Kroll, Kroll Recommended U.S. Equity Risk Premium (ERP) and Corresponding Risk-free Rates (Rf); January 2008—Present *available at:* https://media-cdn.kroll.com/jssmedia/cost-of-capital/kroll-us-erp-rf-table-2024.pdf.

[75] *See* Kroll, Kroll Cost of Capital Resource Center, Kroll Recommended U.S. Equity Risk Premium and Corresponding Risk-Free Rates to be Used in Computing Cost of Capital: January 2008 – Present, (June 5, 2024), *available at:* https://www.kroll.com/en/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates.

percent for 10-year bonds and 4.50 percent for 20-year bonds.[76] I also used the average beta of 0.93 from my proxy group. Finally, I took the average of the two methods—one historical and the other projected—resulting in a CAPM of 9.46 percent and an ECAPM of 9.55 percent.

Q Did you use arithmetic or geometric average for the historical risk premium?

A I used both arithmetic and geometric averages; the latter defined as the compound annual growth rate ("CAGR") for the same period. I generally favor the use of geometric average because it is a more meaningful indicator by looking at growth in total returns from the beginning of the period to the end rather than average of each individual year's growth. Investment returns are often reported using geometric average. Moreover, it is more consistent with other cost of equity methods to use the geometric average, which mimics how assets grow in reality. For instance, the historical and projected Value Line growth rates data used by me and Ms. Bulkley in our DCF estimates employ geometric, not arithmetic growth rates. I recognize that some favor the use of arithmetic average over geometric average. Therefore, because some investors would also review the arithmetic average, I use an average of the two methods in the CAPM.

Q Did you test your calculations using Ameren's proxy group?

A Yes. As with the DCF, I conducted the illustrative exercise of seeing how my CAPM and ECAPM values would change when using Ameren's proxy group. The result was a slight increase of 0.13 percent in my CAPM (9.59 percent up from 9.46 percent) and a 0.10 percent increase from my ECAPM (9.66 percent up from 9.55 percent). Thus, the selection

[76] U.S. Department of the Treasury, Daily Treasury Par Yield Curve Rates, *available at:* https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily_treasury_yield_curve&field_tdr_date_value=2024.

of my proxy group led to slightly lower CAPM and ECAPM estimates, but as I described earlier, higher DCF estimates.

Q Did you test your calculations using only projected data?

A Yes. As with the DCF, I tested the impact of ignoring historical data. This led to a decrease of 0.31 percent in both my CAPM and ECAPM, which were 9.15 and 9.24 percent, respectively, using only projected data.

Q Is the CAPM or ECAPM more valuable of an estimate?

A The CAPM is a better estimate because the ECAPM upwardly adjusts the CAPM value if the beta is under 1. Thus, I see the ECAPM will be higher for utilities in general; but should not be construed as a definitive cost of equity measure, rather as a high bound. Witness Bulkley claims that the ECAPM is helpful because it addresses the "tendency of the 'traditional' CAPM to underestimate the cost of equity" when the beta is below 1.[77] However, this does not appear to be the case in her own analysis: Her CAPM estimate is higher than her DCF or risk premium results and indeed, her final cost of equity recommendation of 10.25 percent is below the lowest range of her CAPM estimates.[78] The ECAPM merely adjusts this already high CAPM values even higher, and thus further away from the ultimate ROE recommendation. Therefore, the need for the ECAPM method appears dubious here. I have presented it in my results as well, but I see it as an extreme value that I do not put on equal footing with the DCF or CAPM results.

[77] Bulkley Direct at p. 44:7-9.

[78] *Id.* at p. 8.

D. The Risk Premium Method Should be Ignored.

Q Do you agree that the utility risk premium method should be also used in addition to the DCF and CAPM?

A No. Witness Bulkley also employs the risk premium model, which tracks the relationship between historical allowable ROEs and utility bond rates. I do not agree that this model is a reasonable estimate of the cost of equity. There are two key problems with this model: 1) it relies solely on historical data; and 2) the historical data includes awarded ROEs from utility commissions that tend to overstate the cost of equity. First, both historical and projected data should be used—as I have explained above. The sole reliance on historical data implicitly assumes that history will just keep repeating. Second, actual ROEs awarded have been mostly decreasing since the 1980's yet there is still an upward bias in these values. This is partly shown by looking at the market value of utility holding companies compared to their book value. In both my and Witness Bulkley's proxy groups, the average market to book ratio is around two—meaning that the stock price is roughly double the equity value on the books for these utilities. If investors are willing to pay much more on the market than the book value, that is an indicator that the ROE is higher than the cost of equity—as I discussed before. Regardless, the use of previously allowed ROEs should not drive future ROE estimates because it introduces circular logic and perpetuates any bias in the allowable ROEs.

Q Please summarize your DCF and CAPM estimates.

A My cost of equity results range between 8.4 and 9.6 percent, as shown below. As I stated, I do not see the ECAPM as on equal footing with the other results but as an extreme value. The average of all four results is 9.1 percent; taking the average of the higher of the two

DCF estimates (8.9 percent) and my CAPM (9.5 percent) produces an average of 9.2 percent.

Table 2: Comings Cost of Equity Estimates

DCF 1	8.4%
DCF 2	8.9%
CAPM	9.5%
ECAPM	9.6%

Q What do you recommend for the allowable ROE?

A Based on my review of the Company's analysis and my own cost of equity estimates, I recommend a ROE between 9.25 and 9.5 percent.

V. Conclusion and Recommendations

Q What do you recommend to the Commission?

A For the reasons explained above I recommend the following:

1. The Commission direct Ameren to comply with its previous rate case order and identify avoidable capital spending for any retirement dates being considered for the Sioux and Labadie units—in all future rate cases.
2. The Commission set an allowable return on equity (ROE) of between 9.25 and 9.5 percent.

Q Does this conclude your testimony?

A Yes.