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**MISSOURI PUBLIC SERVICE COMMISSION**  
**FINANCIAL AND BUSINESS ANALYSIS DIVISION**  
**FINANCIAL ANALYSIS DEPARTMENT**

**DIRECT TESTIMONY**  
**Revenue Requirement**

**OF**

**SEOUNG JOUN WON, PhD**

**UNION ELECTRIC COMPANY,**  
**d/b/a Ameren Missouri**

**CASE NO. ER-2022-0337**

*Jefferson City, Missouri*  
*January 2023*

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SEOUNG JOUN WON, PhD  
UNION ELECTRIC COMPANY,  
d/b/a Ameren Missouri  
CASE NO. ER-2022-0337**

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1 of my educational background and occupational experience appears in Appendix 1, attached to  
2 this Direct Testimony.

3 Q. Have you previously filed testimony before the Commission?

4 A. Yes, I have appeared previously before the Commission. I have testified on rate  
5 of return (“ROR”), cost of capital, capital structure, finance issuance, financial capability,  
6 feasibility study, and valuation analysis on mergers and acquisitions, etc. Please refer to  
7 Appendix 1, attached to this Direct Testimony, for a list of my testimony, recommendations, or  
8 memorandums previously filed with the Commission and the associated issues.

9 Q. On behalf of whom are you testifying in this proceeding?

10 A. I am testifying in this Direct Testimony before the Commission on behalf of the  
11 Missouri Public Service Commission Staff (“Staff”).

12 Q. What is the purpose of your direct testimony?

13 A. In this testimony, Staff presents evidence and provides a recommendation  
14 regarding the appropriate ROR to be used in establishing the electric service rates of Union  
15 Electric Company, d/b/a Ameren Missouri (“Ameren Missouri” or the “Company”), a  
16 subsidiary of Ameren Corporation (“Ameren Corp.” or the “Parent Company”).

17 Staff’s analyses and conclusions are supported by the data presented in  
18 Schedules SJW-d1 through SJW-d17 contained within Appendix 2. Staff’s workpapers will be  
19 provided to the parties at the time of the filing of this Direct Testimony. Staff will make any  
20 additional source documents of specific interest available upon the request of any party to this  
21 case or the Commission.

1 **I. EXECUTIVE SUMMARY**

2 Q. Please provide a summary of your methodology and findings concerning the  
3 ROR that should be utilized in setting rates for Ameren Missouri’s electric utility operations in  
4 this proceeding.

5 A. Staff estimated the market-based cost of common equity (“COE”) for Ameren  
6 Missouri using well-respected COE estimation methodologies such as the discounted cash flow  
7 (“DCF”) model, the capital asset pricing model (“CAPM”), and the risk premium model  
8 (“RPM”).<sup>1</sup> Staff’s analysis also takes into account changes in economic and capital market  
9 conditions over time. The comparative COE analysis method using the DCF model allowed  
10 Staff to calculate the change in authorized return on equity (“ROE”) based on the change in its  
11 COE estimate from period to period by using the Commission’s most recent decision as a  
12 starting point.<sup>2</sup> The Commission’s most recent, fully litigated electric rate case is the Empire  
13 District Electric Company’s rate case, Case No. ER-2019-0374, (“2019 Empire Case”).<sup>3</sup>  
14 By using the decision made by the Commission in the 2019 Empire Case as a benchmark,  
15 Staff calculated a reasonable range of authorized ROEs and recommended a just and reasonable  
16 ROE for Ameren Missouri.<sup>4</sup>

17 Staff also considered the current economic and financial market conditions when  
18 recommending an ROE. The current utility COE estimates are unusually high because of rising  
19 interest rates.<sup>5</sup> The series of events after the coronavirus pandemic (“COVID-19”) such as the

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<sup>1</sup> FERC ¶ 61,154 (2020), *order on reh’g*, Opinion No. 569-B, 173 FERC ¶ 61,159 (2020).

<sup>2</sup> The most recent Ameren Missouri general rate case was settled with no authorized ROE. *Report and Order* issued February 2, 2022, in Case No. ER-2021-0240.

<sup>3</sup> *Amended Report and Order* issued July 23, 2020, in Case No. ER-2019-0374.

<sup>4</sup> COE is the return required by investors; ROE is the return set by a regulatory utility commission. Although some experts contend that COE and ROE are synonymous, Staff’s position is that they need not be. Observed utility COEs have been generally significantly lower than ROEs in recent years.

<sup>5</sup> Schedule SJW-d14, Won’s Direct Testimony.

1 lockdown in China and Russia’s war against Ukraine have caused supply-chain bottlenecks and  
2 high inflation risk.<sup>6</sup> The Federal Reserve (“Fed”) anticipated ongoing increases in interest rates  
3 in a continuing battle to lower U.S. inflation, but noticed there had been an increase in the risk  
4 that the cumulative monetary policy restraint would exceed what was required to bring inflation  
5 back to 2%.<sup>7</sup>

6 Q. Please summarize the result of your comparative COE analysis and  
7 recommended ROR.

8 A. In the *Amended Report and Order* of the 2019 Empire Case issued on July 23,  
9 2020, the Commission found that a 9.25% ROE was fair and reasonable for calculating the  
10 revenue requirement for Empire District Electric Company (“EDE”).<sup>8</sup> For the current rate case,  
11 Staff recommends that the Commission set Ameren Missouri’s authorized ROE at 9.59%, the  
12 midpoint of a reasonable range of 9.34% and 9.84%.<sup>9</sup> Staff considered the current high inflation  
13 rate and the expected rise in interest rates in making these recommendations. Staff’s  
14 recommended authorized ROE is based upon the premise that electric utilities’ COE estimates  
15 rose by approximately 34 basis points since the period of the 2019 Empire Case.<sup>10</sup>  
16 Staff’s recommendation of a 9.59% authorized ROE will fairly compensate Ameren Missouri  
17 for its current market COE and balance the interests of all stakeholders, particularly considering  
18 that the current market COE estimates for Ameren Missouri are presently in the range of 7.30%  
19 to 8.79%.<sup>11</sup>

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<sup>6</sup> Federal Reserve issues Federal Open Market Committee (FOMC) statement, published April 6, 2022, and, retrieved April 23, 2022, <https://www.federalreserve.gov/monetarypolicy/fomcminutes20220316.htm>.

<sup>7</sup> Federal Reserve issues Minutes of the Federal Open Market Committee, released November 23, 2022, and, retrieved November 24, 2022, <https://www.federalreserve.gov/monetarypolicy/files/fomcminutes20221102.pdf>.

<sup>8</sup> Page 38, Amended Report and Order issued July 23, 2020, in Case No. ER-2019-0374.

<sup>9</sup> Schedule SJW-d16, Won’s Direct Testimony.

<sup>10</sup> Schedule SJW-d15, Won’s Direct Testimony.

<sup>11</sup> Schedule SJW-d13, Won’s Direct Testimony.

1 Staff also recommends that the Commission use Ameren Missouri's actual capital  
2 structure of 51.84% common equity, 0.66% preferred stock and 47.50% long-term debt as of  
3 September 30, 2022, for the purposes of setting Ameren Missouri's ROR in this proceeding.<sup>12</sup>  
4 Among other reasons, Ameren Missouri's standalone capital structure is the appropriate capital  
5 structure for use in this proceeding because Ameren Missouri has an independently determined  
6 capital structure in that its debt is secured by its own assets and not the assets of its parent  
7 company, Ameren Corp., or any of Ameren Corp.'s other subsidiaries.<sup>13</sup> Additionally, Ameren  
8 Missouri's stand-alone capital structure supports its own bond rating.<sup>14</sup> Consistent with Staff's  
9 capital structure recommendation, Staff also recommends at this time that the Commission use  
10 a cost of preferred stock of 4.18% and a cost of debt of 3.92%, resulting in the overall midpoint  
11 ROR of 6.86%, taken from the calculated range of 6.73% to 6.99%.<sup>15</sup>

12 Q. Please explain how your direct testimony is organized.

13 A. Staff's testimony is organized into five sections. First, Staff discusses the  
14 applicable regulatory principles concerning cost of capital and ROR analysis that support the  
15 just and reasonable rates for Ameren Missouri's electric utility service. Second, Staff reviews  
16 the current economic environment and capital market conditions. Third, Staff presents the  
17 corporate analysis of Ameren Missouri and its parent company's business profile and credit  
18 ratings. Fourth, Staff explains its cost of capital and ROR analysis using Ameren Missouri's  
19 capital structure. Fifth, Staff concludes with a presentation of Staff's recommended ROE, cost  
20 of debt, and ratemaking capital structure for calculating Ameren Missouri's allowed ROR for  
21 ratemaking purposes.

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<sup>12</sup> Schedule SJW-d6, Won's Direct Testimony.

<sup>13</sup> Staff's Data Request No. 0196.

<sup>14</sup> S&P Capital IQ Pro.

<sup>15</sup> Schedule SJW-d16, Won's Direct Testimony.

1 **II. REGULATORY PRINCIPLES**

2 Q. What are the guiding principles determining a just and reasonable ROR for a  
3 regulated utility?

4 A. The determination of a fair ROR is guided by principles of economic and  
5 financial theory as well as by certain minimum Constitutional standards. Investor-owned  
6 public utilities, such as Ameren Missouri, are private property that the state may not  
7 confiscate without appropriate compensation. The United States Supreme Court has described  
8 the minimum characteristics of a Constitutionally-acceptable ROR in two frequently-cited  
9 cases: *Bluefield Water Works & Improvement Co. v. Public Service Commission of West*  
10 *Virginia*, and *Federal Power Commission v. Hope Electric Co.*<sup>16</sup>

11 Q. What are the regulatory principles derived from the *Bluefield* and *Hope*  
12 decisions?

13 A. From these two decisions, Staff derives and applies the following principles to  
14 guide it in recommending a just and reasonable ROR:

- 15 1. A return commensurate with returns on investments of comparable risk;
- 16 2. A return that allows the utility to attract capital on reasonable terms; and
- 17 3. A return sufficient to assure confidence in the utility's financial integrity.

18 Embodied in these three principles is the economic theory of the opportunity cost  
19 of investment. The opportunity cost of investment is the return that investors forego in order  
20 to invest in similar-risk investment opportunities that vary depending on market and  
21 business conditions.

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<sup>16</sup> *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679, 43 S.Ct. 675, 67 L.Ed. 1176 (1923); *Federal Power Commission v. Hope Electric Co.*, 320 U.S. 591, 64 S.Ct. 281, 88 L.Ed. 333 (1943).



1 Q. How do the regulatory principles of the *Bluefield* and *Hope* decisions guide the  
2 current Ameren Missouri rate case?

3 A. Methodologies of financial analysis have advanced greatly since the *Bluefield*  
4 and *Hope* decisions.<sup>17</sup> Additionally, today's utilities compete for capital in a global market  
5 rather than a local market. Nonetheless, the parameters defined in those cases are readily met  
6 using current methods and theory. The principle of commensurate return is based on the  
7 concept of risk. Financial theory holds that the return an investor may expect is reflective of  
8 the degree of risk inherent in the investment; risk being a measure of the likelihood that an  
9 investment will not perform as expected by that investor. Any line of business carries with it  
10 its own risks, and it follows, therefore, that the return Ameren Missouri's shareholders may  
11 expect is equal to that required by shareholders of comparable-risk utility companies.

12 Q. How does Staff estimate a just and reasonable authorized ROE regarding  
13 commensurate return and comparable-risk?

14 A. Staff employed a comparative COE analysis to produce an authorized ROE  
15 estimation. COE is a market-determined, minimum return investors are willing to accept for  
16 their investment in a company compared to returns on other available investments. Using  
17 market data, COE can be directly estimated. An authorized ROE, on the other hand, is a  
18 Commission-determined return granted to monopoly industries, allowing them the  
19 opportunity to earn just and reasonable compensation for their investments in the rate base.  
20 Stock market data cannot directly determine an authorized ROE. However, Staff can estimate  
21 a just and reasonable authorized ROE anticipated by the financial market by using a previous

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<sup>17</sup> Neither the Discounted Cash Flow ("DCF") nor the Capital Asset Pricing Model ("CAPM") methods were in use when those decisions were issued.

1 Commission-determined ROE and changes in estimated COEs over different periods of time,  
2 that are measured for a comparable group of companies having similar risks.

3 Q. What are Staff’s conclusions regarding the regulatory principles that guide the  
4 determination of a just and reasonable ROE in this proceeding?

5 A. Staff relied primarily on the analysis of a comparable group of companies to  
6 estimate the COE for Ameren Missouri, applying this comparable-company approach using the  
7 DCF method and the CAPM and RPM analyses. Properly used and applied in appropriate  
8 circumstances, Staff’s methods can provide accurate estimates of utilities’ COE. It is a  
9 well-accepted economic theory that a company that earns its cost of capital will be able to attract  
10 capital and maintain its financial integrity. Therefore, Staff’s recommendation of an authorized  
11 ROE, based on a COE derived from the comparison of peer companies, is consistent with the  
12 principles set forth in *Bluefield* and *Hope*.

13 **III. MARKET CONDITIONS**

14 Q. Why is consideration of economic and capital market conditions important for  
15 ROE analysis?

16 A. Determining whether a cost of capital estimate is just and reasonable requires a  
17 good understanding of current economic and capital market conditions, with the former having  
18 a significant impact on the latter. In the comparative COE analysis, input values for  
19 COE estimate models change from the former time-period to the latter time-period to reflect  
20 the current economic and capital market conditions. With this in mind, Staff emphasizes that  
21 an estimate of a utility’s COE and authorized ROE recommendation should pass the “common  
22 sense” test when considering the broader current economic and capital market conditions.

1           **1.       Economic Conditions**

2           Q.       Please summarize the current economic conditions regarding COE.

3           A.       When COVID-19 hit in 2020, it caused massive volatility in the financial  
4 markets.<sup>18</sup> Gross domestic product (“GDP”) fell sharply, followed by an equally sharp recovery  
5 through 2021.<sup>19</sup> After recovering in 2021 from the COVID-19 pandemic recession, economic  
6 activity edged down during the first and second quarters but rebounded in the third quarter of  
7 2022.<sup>20</sup> Recent indicators of spending and production have pointed to modest growth despite  
8 robust job gains and the unemployment rate remaining low in recent months.<sup>21</sup>

9           The current high inflation rate is attributed to many different factors, many of which are  
10 a result of the COVID-19 pandemic.<sup>22</sup> The recovery from the COVID-19 pandemic spurred  
11 fears of higher inflation and, consequently, higher market risk.<sup>23</sup> Inflation fears increased  
12 market risk for utilities as investors believed that regulators would not adjust revenues fast  
13 enough to compensate for the rising input costs.<sup>24</sup> For example, in June 2022, the consumer  
14 price index soared at an annual rate of 9.1%, a new 40-year high driven by increases in the cost  
15 of energy, mainly due to a 98% increase in fuel oil prices.<sup>25</sup> COVID-19 related lockdowns in  
16 China are creating supply chain disruptions.<sup>26</sup> Continuing Russia's war against Ukraine is

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<sup>18</sup> Federal Reserve Economic Data, retrieved March 23, 2022, <https://fred.stlouisfed.org/series/VIXCLS>.

<sup>19</sup> Bureau of Economic Analysis, Gross Domestic Product, First Quarter 2022, retrieved May 25, 2022, <https://www.bea.gov/news/2022/gross-domestic-product-first-quarter-2022-advance-estimate>.

<sup>20</sup> Bureau of Economic Analysis, Gross Domestic Product, Third Quarter 2022, Retrieved November 4, 2022, <https://www.bea.gov/news/2022/gross-domestic-product-third-quarter-2022-advance-estimate>.

<sup>21</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published November 2, 2022 and retrieved November 4, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a.htm>.

<sup>22</sup> CNBC, Why is inflation so high? An economist explains why everyday essentials cost more, published July 29, 2022 and retrieved August 21, 2022, <https://www.cnbc.com/select/why-is-inflation-so-high/>.

<sup>23</sup> S&P Global, Markets in Motion, retrieved March 23, 2022, <https://www.spglobal.com/en/research-insights/featured/inflation>.

<sup>24</sup> Hartford Funds, Insight, Which Equity Sectors Can Combat Higher Inflation?, retrieved March 23, 2022, <https://www.hartfordfunds.com/dam/en/docs/pub/whitepapers/WP597.pdf>.

<sup>25</sup> Bureau of Labor Statistics, Consumer Price Index, <https://www.bls.gov/cpi/>

<sup>26</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published June 15, 2022 and retrieved June 17, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220615a.htm>.

1 creating additional upward pressure on inflation.<sup>27</sup> The impact of these issues for the U.S.  
2 economy are highly uncertain.<sup>28</sup>

3 On November 2, 2022, the Federal Open Market Committee (“FOMC” or “the Fed”)  
4 decided to raise the target range for the federal funds rate to between 3.75% and 4.00%.<sup>29</sup>  
5 During the FOMC meeting, the participants assessed appropriate monetary policy and  
6 determined the target level for the federal funds rate. The Fed anticipates that ongoing increases  
7 to the target range for the federal funds rate will be appropriate in the future, but a few  
8 participants of FOMC commented that slowing the pace of increase could reduce the risk of  
9 instability in the financial system.<sup>30</sup>

10 However, there is no financial theory or regulatory rule that the Commission must  
11 authorize an unusually high ROE because of the current unusually high levels of inflation rates  
12 and interest rates. The price investors are willing to pay for a share of stock includes the  
13 expectation of high inflation and potential increases to the federal funds rate, so these economic  
14 and financial market conditions have already been factored in the investors’ analysis since the  
15 beginning of 2021.<sup>31</sup> This means that lower real returns from investments are already reflected  
16 in the current financial market. Therefore, high inflation rates or high interest rates do not  
17 necessarily mean a higher cost of capital than what is presently reflected.

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<sup>27</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published November 2, 2022 and retrieved November 4, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a.htm>.

<sup>28</sup> Federal Reserve issues Minutes of the Federal Open Market Committee, released November 23, 2022 and retrieved November 24, 2022, <https://www.federalreserve.gov/monetarypolicy/files/fomcminutes20221102.pdf>.

<sup>29</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published November 2, 2022 and retrieved November 4, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a.htm>.

<sup>30</sup> Federal Reserve issues Minutes of the Federal Open Market Committee, released November 23, 2022 and retrieved November 24, 2022, <https://www.federalreserve.gov/monetarypolicy/files/fomcminutes20221102.pdf>.

<sup>31</sup> Forbes, Jonathan Ponciano, Here’s The Biggest Risk For The Stock Market This Year, According To Morgan Stanley Experts, Published January 4, 2021, retrieved November 22, 2021, <https://www.forbes.com/sites/jonathanponciano/2021/01/04/biggest-risk-for-stock-market-this-year/?sh=31bfed21f80e>.

1 Q. Please explain the current economic conditions after the COVID-19 pandemic  
2 using the macroeconomic indicator.

3 A Since 2020, the economy has experienced enormous volatility. Real GDP fell  
4 by 31.4% in the second quarter of 2020, after a 5% decline in the first quarter.<sup>32</sup> The third  
5 and fourth quarters of 2020 saw real GDP increase by 33.4% and 4.3%, respectively.<sup>33</sup>  
6 Subsequently, the first, second, third, and fourth quarters of 2021 had corresponding real  
7 GDP growth rates of 6.3%, 6.7%, 2.3%, and 6.9%. Real GDP decreased at an annual rate of  
8 1.6% and 0.6% in the first and second quarters of 2022, respectively, and increased at 2.6%  
9 in the third quarter of 2022.<sup>34</sup> In July 2022, the Congressional Budget Office (“CBO”)  
10 projected growth rates for real GDP (1.9%) and real potential GDP (1.8%) over the next  
11 decade.<sup>35</sup> The Fed projects a longer-run<sup>36</sup> real GDP growth rate of 1.6% to 2.2%.<sup>37</sup>  
12 The U.S. Energy Information Administration (“EIA”) projects a long-term real GDP growth  
13 rate of 2.2%.<sup>38</sup> The CBO projected a longer-term real potential GDP growth rate of 1.5%.<sup>39</sup>

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<sup>32</sup> Bureau of Economic Analysis, Gross Domestic Product, Second Quarter 2020, Retrieved December 7, 2022, <https://www.bea.gov/news/2020/gross-domestic-product-2nd-quarter-2020-advance-estimate-and-annual-update>.

<sup>33</sup> Bureau of Economic Analysis, Gross Domestic Product, Fourth Quarter 2020, Retrieved November 4, 2022, <https://www.bea.gov/news/2021/gross-domestic-product-4th-quarter-and-year-2020-advance-estimate>. Bureau of Economic Analysis, Gross Domestic Product, First Quarter 2021, Retrieved November 4, 2022, <https://www.bea.gov/news/2021/gross-domestic-product-first-quarter-2021-advance-estimate>.

<sup>34</sup> Bureau of Economic Analysis, Gross Domestic Product, Third Quarter 2022, Published October 27, 2022, <https://www.bea.gov/news/2022/gross-domestic-product-third-quarter-2022-advance-estimate#:~:text=Gross%20Domestic%20Product%2C%20Third%20Quarter%202022%20%28Advance%20Estimate%29,the%20second%20quarter%2C%20real%20GDP%20decreased%200.6%20percent>.

<sup>35</sup> Congressional Budget Office, The 2022 Long-Term Budget Outlook, Figure B-1, page 40, <https://www.cbo.gov/system/files/2022-07/57971-LTBO.pdf>.

<sup>36</sup> According to Fed, the longer-run projections are the rates of growth, inflation, unemployment, and federal funds rate to which a policymaker expects the economy to converge over time in the absence of further shocks and under appropriate monetary policy. <https://fred.stlouisfed.org/series/FEDTARMDLR#:~:text=The%20longer-run%20projections%20are%20the%20rates%20of%20growth%2C.of%20further%20shocks%20and%20under%20appropriate%20monetary%20policy>.

<sup>37</sup> FOMC, Summary of Economic Projections, released September 21, 2022, <https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20220921.pdf>.

<sup>38</sup> Energy Information Administration, retrieved in April 23, 2022. <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=18-AEO2022&sourcekey=0>.

<sup>39</sup> Congressional Budget Office, The 2022 Long-Term Budget Outlook, Figure 3-2, page 27, <https://www.cbo.gov/system/files/2022-07/57971-LTBO.pdf>.

1 In July 2022, the CBO projected a longer-term nominal GDP growth rate of 3.90%,<sup>40</sup> up from  
2 the 3.80% it previously projected in February 2021.<sup>41</sup>

3 Q. Please explain the current Fed monetary policy and the US economy after the  
4 COVID-19 pandemic.

5 A. With COVID-19 causing widespread economic shutdown and pushing interest  
6 rates higher, the Fed intervened in March 2020 to cut the federal discount rate to a range of 0%  
7 to 0.25%.<sup>42</sup> The Fed stated they would continue reducing its holdings of Treasury securities  
8 and agency debt and agency mortgage-backed securities.<sup>43</sup> The Fed also gave assurances that  
9 indicators of economic activity and employment continued to strengthen.<sup>44</sup> In June, July,  
10 September and November 2022, to fight inflation, the Fed increased the target for the federal  
11 funds rate by 75 basis points each time reaching a range of 3.75% to 4.00%.<sup>45</sup> At the time, the  
12 June increase was the largest single rate hike since 1994. The Fed also anticipated that ongoing  
13 increases in the target range would be appropriate.<sup>46</sup>

14 In November 2022, the Fed stated, “inflation remains elevated, reflecting supply and  
15 demand imbalances related to the pandemic, higher food and energy prices, and broader price  
16 pressures.”<sup>47</sup> All else being equal, high inflation expectations lead to higher interest rates. The

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<sup>40</sup> Congressional Budget Office, The 2022 Long-Term Budget Outlook, Figure B-1, page 40,  
<https://www.cbo.gov/system/files/2022-07/57971-LTBO.pdf>.

<sup>41</sup> Congressional Budget Office, An Update to the Budget and Economic Outlook: 2021 to 2031, page 12,  
<https://www.cbo.gov/system/files?file=2021-02/56970-Outlook.pdf>.

<sup>42</sup> Federal Reserve, Press Release, March 15, 2020,  
<https://www.federalreserve.gov/monetarypolicy/files/monetary20200315a1.pdf>.

<sup>43</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published November 2, 2022 and  
retrieved November 4, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a.htm>.

<sup>44</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published November 2, 2022 and  
retrieved November 4, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a.htm>.

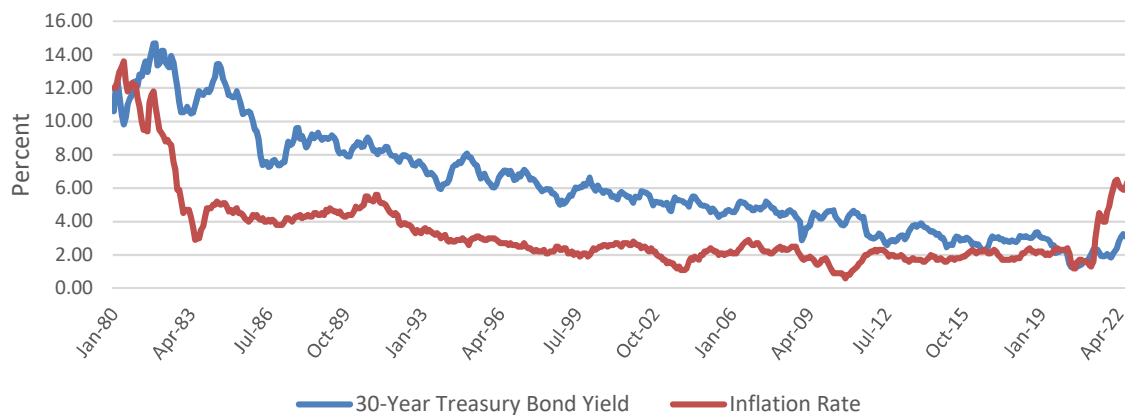
<sup>45</sup> Forbes Advisor, updated November 2, 2022, retrieved December 8, 2022,  
<https://www.forbes.com/advisor/investing/fed-funds-rate-history/>

<sup>46</sup> Federal Reserve Board - Federal Reserve issues FOMC statement, published June 15, 2022,  
<https://www.federalreserve.gov/newsevents/pressreleases/monetary20220615a.htm>.

<sup>47</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published November 2, 2022 and  
retrieved November 4, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a.htm>.

1 effects of COVID-19 and high inflation fears have increased market risk and, consequently,  
2 pushed utilities' COEs higher. Compounded by the current fears of continued rising inflation,  
3 the share prices of electric utility equities are currently still depressed.

4 **Figure 1. 30-year Treasury yield and Inflation Rate 1980-2022<sup>48</sup>**



5  
6 Figure 1 compares 30-year Treasury yields and the U.S. inflation rate from January 1980  
7 through November 2022. As the Fed signaled, it is expected that interest rates will continue to  
8 rise because of the current high inflation rate.<sup>49</sup> The aggregate effect of the Fed's actions was  
9 an incline in 30-year Treasury yields from 1.69% on December 3, 2021, to a high of 4.40% on  
10 October 24, 2022.<sup>50</sup> With interest rates expected to continue rising, it is reasonable to expect  
11 utilities' COEs to remain elevated in the near future. However, the expectation that COEs  
12 remain elevated in the near future may not actually occur and is dependent on other economic  
13 and financial conditions. As shown in Figure 1, there is no perfectly positive correlation

<sup>48</sup> Won's Direct Workpaper.

<sup>49</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published July 27, 2022, and retrieved August 1, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm>.

<sup>50</sup> Federal Reserve Economic Data, Market Yield on U.S. Treasury Securities at 30-Year Constant Maturity, <https://fred.stlouisfed.org/series/DGS30>.

1 between inflation rates and 30-year Treasury yields. Furthermore, the monthly average 30-year  
2 Treasury yields changed from a high of 4.04% in October 2022 to 4.00% in November 2022.  
3 Currently, the daily 30-year Treasury yields shows a decreasing trend since November 7, 2022,  
4 and is 3.48% as of December 15, 2022.<sup>51</sup>

5 Q. Please explain the result of the comparative COE analysis effected by Fed  
6 monetary policy for the current economic conditions.

7 A. The Fed has a dual mandate: maximum employment and stable prices.<sup>52</sup> The  
8 unemployment rate has been in a narrow range of 3.5% to 3.7% since March 2022, and in  
9 November 2022, the unemployment rate (3.7%) was higher than the pre-pandemic level (3.5%)  
10 from February 2020.<sup>53</sup> In the FOMC meeting held on September 20-21, 2022, the Fed's growth  
11 forecast indicated policy makers expected the U.S. economy to grow by 0.2% in 2022 and  
12 unemployment to rise to 3.8% by year-end 2022.<sup>54</sup> Currently, the overall global and U.S.  
13 economic conditions indicate a higher COE than the 2019 Empire Case because of rising  
14 interest rates that occurred in 2022 and expected increases in 2023.

## 15 2. Capital Market Conditions

16 Q. Why is consideration of capital market conditions important for COE analysis?

17 A. Capital market conditions are important in the estimation of COE because they  
18 have a direct impact on input values of COE models. A utility company's cost of capital reflects  
19 its mix of equity and debt financing, and is affected by the equity and debt markets. For

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<sup>51</sup> FRED Economic Data, ST Louis Fed, <https://fred.stlouisfed.org/series/DGS30#0>.

<sup>52</sup> Fed, What economic goals does the Federal Reserve seek to achieve through its monetary policy?  
<https://www.federalreserve.gov/faqs/what-economic-goals-does-federal-reserve-seek-to-achieve-through-monetary-policy.htm>.

<sup>53</sup> Bureau of Labor Statistics, News released December 2, 2022, retrieved December 6, 2022,  
<https://www.bls.gov/news.release/pdf/empsit.pdf>.

<sup>54</sup> Fed, Summary of Economic Projections, published September 21, 2022,  
<https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20220921.pdf>.



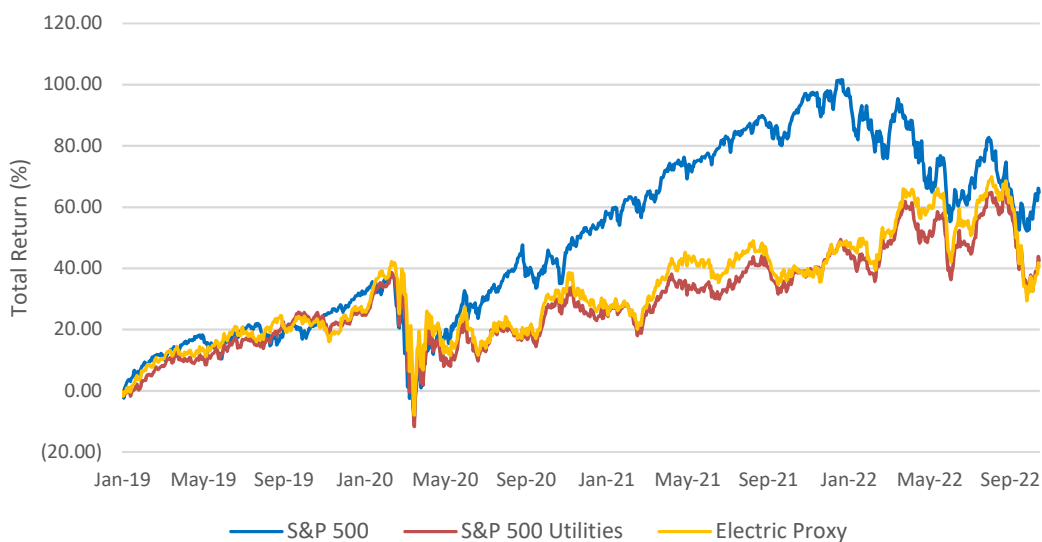
1 example, equity market conditions have a direct impact on input values such as dividend yields  
2 in the DCF model, and debt market conditions directly affect the input values such as the  
3 risk-free rate of 30-year Treasury bond yields in the CAPM method.

## 4 2.1 Utility Equity Market

5 Q. Please explain the current utility equity market conditions.

6 A. After the 2020 stock market crash caused by the COVID-19 pandemic, the  
7 utilities sector underperformed the broader market. At the onset of the economic shutdown in  
8 March 2020, the index-value of the S&P 500 and the Dow Jones Industrial Average fell  
9 approximately 12.5% and 13.74%, respectively.<sup>55</sup> Figure 2 shows the volatility experienced by  
10 the stock market since January 2020.

11 **Figure 2. Total Return 2020-2022<sup>56</sup>**



12 <sup>55</sup> S&P Capital IQ Pro.

<sup>56</sup> Won's Direct Workpaper.

1           The total return of the S&P 500 Utilities decreased from the point of reference on  
2 the first day of 2020 to an approximate loss of thirty-six percent (-36%) in March 2020, only to  
3 rebound to a gain of approximately twenty-three percent (23%) from the original point of  
4 reference by January 2022. Subsequently, the total return realized an approximate loss of eight  
5 percent (8%) by September 2022. A detailed analysis of the performance of the equity market  
6 since January 2020 reveals tremendous volatility. As shown in Figure 2, the S&P 500 had total  
7 returns of 69.04% compared to only 23.39% for the S&P 500 Utilities sector on the first day of  
8 2022 from the point of reference on the first day of 2020. Staff's electric proxy group of  
9 companies also under-performed, returning 21.80% in the same period. During economic  
10 recovery from COVID-19 pandemic, utilities tended to underperform the broader market,  
11 which, consequently, pushed the COE for utilities higher.<sup>57</sup>

12           Q.     Please explain how utility equity market conditions affect the COE estimation.

13           A.     The average stock price of Staff's electric utility proxy group is currently higher  
14 than when Staff presented testimony for the 2019 Empire Case.<sup>58</sup> Average stock prices for  
15 Staff's proxy group of companies is \$78.30 in Q3 2022 compared to \$76.11 in Q4 2019.<sup>59</sup>  
16 Inclining stock prices, all else remaining the same, mean a decreasing COE.<sup>60</sup>

17           Staff also analyzed other variables that affect change in COE: projected dividend yields  
18 and expected growth rates. The average dividend yield of Staff's electric utility proxy group  
19 was 3.02% during the measurement period of Q4 2019 in the 2019 Empire Case compared to  
20 3.44% in the current measurement period of Q3 2022, an increase of 42 basis points.<sup>61</sup>

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<sup>57</sup> Figure 2, Won's Direct Testimony.

<sup>58</sup> Wall Street Journal; Average Monthly Highest and Lowest.

<sup>59</sup> Schedule SJW-d12, Won's Direct Testimony.

<sup>60</sup> In the DCF COE model, inclining stock prices, all else being equal, leads to lower dividend yields. Dividend yields are a component of COE.

<sup>61</sup> The Value Line Investment Survey: Ratings & Reports. Schedule SJW-d13, Won's Direct Testimony.

1 Projected earnings per share (“EPS”) growth rates for Staff’s proxy group increased  
2 from 4.65% to 4.77% during the period of Q4 2019 and Q3 2022, respectively.<sup>62</sup> Higher  
3 estimated growth rates, all else being equal, signal a higher required return to investors.  
4 Consequently, the current stock market climate justifies increasing COE estimates compared to  
5 the 2019 Empire Case.

6 The net effect of the changes in stock prices, dividend yields, and growth rates indicates  
7 the DCF COE estimate increased by approximately 34 basis points since Staff conducted its  
8 analysis for the 2019 Empire Case.<sup>63</sup> However, only considering the equity market and using  
9 only the DCF model is not sufficient to estimate a proper COE. To recommend a just and  
10 reasonable authorized ROE for the purpose of ratemaking for Ameren Missouri in this  
11 proceeding under a rising interest rate environment, Staff also considered other factors like the  
12 utility debt market and utilized CAPM COE estimates.

## 13 2.2 Utility Debt Market

14 Q. Please explain the current utility debt market conditions.

15 A. The utility debt market has not been stable in terms of bond yield changes.  
16 Average public utility bond yields fell from 4.48% in January 2019, to 2.76% in August 2020.<sup>64</sup>  
17 This downward trend in public utility bond yields reversed after the Fed started its  
18 Treasury bond-buying activity.<sup>65</sup> In November 2022, the Fed decided to raise the target range  
19 for the federal funds rate to between 3.75% and 4.00%.<sup>66</sup> Compared to the yield of 2.76% in

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<sup>62</sup> Schedule SJW-d11, Won’s Direct Testimony.

<sup>63</sup> Schedule SJW-d13, Won’s Direct Testimony.

<sup>64</sup> Schedule SJW-d4-1, Won’s Direct Testimony.

<sup>65</sup> Brookings, What if the Federal Reserve books losses because of its quantitative easing?,  
<https://www.brookings.edu/blog/up-front/2022/06/01/what-if-the-federal-reserve-books-losses-because-of-its-quantitative-easing/>.

<sup>66</sup> Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published November 2, 2022 and retrieved November 4, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20221102a.htm>.

1 August 2020, public utility bond yields rose by 315 basis points to 5.91% in October 2022.<sup>67</sup>  
2 The changes in public utility bond yields mirrored the changes in the 30-Year Treasury bond  
3 yields. With a few exceptions, 30-Year Treasury bond yields have historically been positively  
4 correlated with public utility bond yields.<sup>68</sup> The biggest factor currently driving interest rates  
5 is the fear of continued higher inflation.

6 Q. Have the utility debt market conditions changed since the Commission last  
7 ordered an authorized ROE in the 2019 Empire Case?

8 A. Yes. Since the Commission last ordered an authorized ROE of 9.25% in the  
9 2019 Empire Case,<sup>69</sup> the 30-Year Treasury bond yield increased 100 basis points from 2.26%  
10 in Q4 2019 to 3.26% in Q3 2022.<sup>70</sup> Average public utility bond yields increased 153 basis  
11 points from 3.46% in Q4 2019 to 4.99% in Q3 2022.<sup>71</sup> The average A and Baa public utility  
12 bond yields increased from 3.41% and 3.74% in Q4 2019 to 4.94% and 5.28% in Q3 2022,  
13 respectively.<sup>72</sup>

14 Q. Please explain how the current debt market conditions affect COE estimation.

15 A. In the past, interest rates were typically the main driver of COE change.  
16 Higher interest rates would normally mean higher COEs, all other things being equal.  
17 Currently, we see higher COEs based upon higher interest rates. Staff compared interest rates  
18 during the 2019 Empire Case measurement period (Q4 2019) to the current Ameren Missouri  
19 rate case measurement period (Q3 2022) and noticed that prime interest rates increased by about

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<sup>67</sup> Schedule SJW-d4-1, Won's Direct Testimony.

<sup>68</sup> Schedule SJW-d4-3, Won's Direct Testimony.

<sup>69</sup> Page 38, Amended Report and Order issued July 23, 2020, in Case No. ER-2019-0374.

<sup>70</sup> Schedule SJW-d4-2, Won's Direct Testimony.

<sup>71</sup> Schedule SJW-d4-1, Won's Direct Testimony.

<sup>72</sup> Schedule SJW-d4-5, Won's Direct Testimony.

1 53 basis points.<sup>73</sup> The combined net result of the increase in interest rates and the changes in  
2 overall market conditions resulted in an increase in Staff's COE estimates of the electric proxy  
3 group since the 2019 Empire Case.

4 **IV. CORPORATE ANALYSIS**

5 Q. Please provide the corporate profile of Union Electric Company.

6 A. According to Standard & Poor's ("S&P"), Union Electric Company was founded  
7 in 1881, and was incorporated in Missouri in 1922. Union Electric Company, doing business  
8 as Ameren Missouri, operates a rate-regulated electric generation, transmission, and  
9 distribution business. Ameren Missouri, owned by a subsidiary of Ameren Corporation,  
10 supplies electric to a 24,000-square-mile area in central and eastern Missouri, including the  
11 Greater St. Louis area and electric service to 1.2 million customers.

12 Ameren Missouri is a transmission-owning member of the Midcontinent Independent  
13 System Operator, Inc. ("MISO"), a regional transmission organization. Ameren Missouri is  
14 authorized by the Commission to participate in the MISO through May 2024. Ameren Missouri  
15 is periodically required to make a filing with the Commission regarding its continued  
16 participation in the MISO.

17 Ameren Missouri files a long-term nonbinding integrated resource plan (the "IRP") with  
18 the Commission every three years. In August 2021, the Commission issued an order affirming  
19 the IRP's compliance with Missouri law. The IRP targets cleaner and more diverse sources of  
20 energy generation, including solar, wind, hydro, and nuclear power; and supports increased

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<sup>73</sup> Fed, <http://research.stlouisfed.org/fred2/data/MPRIME.txt>. Average prime interest rates for Q4 2019 and Q3 2022. The average of prime interest rate for Q1 2021 was 4.83%. The average of prime interest rate for Q3 2022 was 5.36%. (5.36% - 4.83% = 0.53%).

1 investment in new energy technologies. The IRP also includes expanding renewable sources  
2 by adding 3,100 megawatts (MWs) of renewable generation by the end of 2030 and 5,400 MWs  
3 of renewable generation by 2040, inclusive of the High Prairie Renewable and Atchison  
4 Renewable energy centers. Ameren Missouri will seek the Nuclear Regulatory Commission  
5 (“NRC”) approval for an extension of the operating license for the Callaway Energy Center.  
6 The IRP also includes expanding customer energy-efficiency programs, adding demand  
7 response programs, accelerating the retirement dates of the Sioux and Rush Island coal-fired  
8 energy centers to 2028 and 2039,<sup>74</sup> respectively, and retiring the remaining coal-fired energy  
9 centers as they reach the end of their useful lives, including the Meramec Energy Center by the  
10 end of 2022.

11 Ameren Missouri owns energy centers that rely on a diverse fuel portfolio, including  
12 coal, nuclear, and natural gas, as well as renewable sources of generation, which include  
13 hydroelectric, wind, methane gas, and solar. The Callaway nuclear energy center began  
14 operation in 1984, and it is licensed to operate until 2044. Ameren Missouri has entered into  
15 uranium, uranium conversion, uranium enrichment, and fabrication contracts to procure the fuel  
16 supply for its Callaway Energy Center. Ameren Missouri has inventories and supply contracts  
17 sufficient to meet all of its uranium, conversion, and enrichment requirements at least through  
18 the 2026 refueling.

19 Ameren Missouri has an ongoing need for coal as fuel for generation, and pursues a  
20 price-hedging strategy consistent with this requirement. Ameren Missouri has agreements in  
21 place to purchase and transport coal to its energy centers. As of December 31, 2021, Ameren  
22 Missouri had price-hedged 99% of its expected coal supply and 100% of its coal transportation

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<sup>74</sup> S&P Capital IQ Pro., Union Electric Company, Long Business Description, Retrieved December 22, 2022.

1 requirements for generation in 2022. Ameren Missouri has additional coal supply under  
2 contract through 2025. The Powder River Basin coal transport agreements that Ameren  
3 Missouri has with Union Pacific Railroad and Burlington Northern Santa Fe Railway are set to  
4 expire at the end of 2024. Ameren Missouri burned approximately 16.5 million tons of coal in  
5 2021. About 98% of Ameren Missouri's coal is purchased from the Powder River Basin in  
6 Wyoming, which has a limited number of suppliers. The remaining coal is typically purchased  
7 from the Illinois Basin. According to its latest regulated infrastructure investment plan, Ameren  
8 Missouri plans to spend \$9 billion through 2025 on grid modernization, transmission system  
9 build-out, and renewable generation capacity.<sup>75</sup>

10 Q. Please provide the corporate profile of Ameren Corp.

11 A. The following summary based on Ameren Corp.'s Form 10-K filing with the  
12 Securities and Exchange Commission ("SEC") in February 23, 2022 provides a good  
13 description of Ameren Corp.'s current business operations and current organizational structure.

14 Ameren Corp. formed in 1997 and headquartered in St. Louis, Missouri,  
15 is a public utility holding company whose primary assets are its equity  
16 interests in its subsidiaries. Ameren's subsidiaries are separate,  
17 independent legal entities with separate businesses, assets, and liabilities.  
18 Dividends on Ameren's common stock and the payment of expenses by  
19 Ameren depend on distributions made to it by its subsidiaries... Ameren  
20 Corp. has four segments: Ameren Missouri, Ameren Illinois Electric  
21 Distribution, Ameren Illinois Natural Gas, and Ameren Transmission.  
22 The Ameren Missouri segment includes all of the operations of Ameren  
23 Missouri. Ameren Illinois Electric Distribution consists of the electric  
24 distribution business of Ameren Illinois. Ameren Illinois Natural Gas  
25 consists of the natural gas business of Ameren Illinois. Ameren  
26 Transmission primarily consists of the aggregated electric transmission  
27 businesses of Ameren Illinois and ATXI... Ameren Missouri operates a  
28 rate-regulated electric generation, transmission, and distribution  
29 business and a rate-regulated natural gas distribution business in  
30 Missouri. Ameren Illinois operates rate-regulated electric transmission,

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<sup>75</sup>Union Electric Company, d/b/a Ameren Missouri, RatingDirect, S&P Global Ratings.

1 electric distribution, and natural gas distribution businesses in Illinois.  
2 ATXI operates a FERC rate-regulated electric transmission business.<sup>76</sup>

3 Q. What are the credit ratings for Ameren Missouri and Ameren Corp.?

4 A. Ameren Missouri and Ameren Corp. each receive individual credit ratings as  
5 stand-alone entities. Both Ameren Missouri and Ameren Corp. are currently rated by Moody's  
6 and S&P and are both assigned corresponding ratings of 'Baa1' and 'BBB+' by each agency,  
7 respectively.<sup>77</sup> Since the electric utilities have average bond ratings of 'Baa1' and 'BBB+'  
8 provided by Moody's and S&P, respectively,<sup>78</sup> Ameren Missouri's authorized ROE should be  
9 set within a reasonable range compared to the average authorized ROE of electric utility  
10 companies in the U.S.

11 **V. CAPITAL STRUCTURE**

12 Q. What issues did Staff consider to determine its ratemaking capital structure for  
13 Ameren Missouri?

14 A. Ameren Missouri's ratemaking capital structure should be representative of its  
15 risk profile considering its financing components such as common equity, preferred stock,  
16 long-term debt, and short-term debt. Staff considered two major issues to determine its capital  
17 structure for Ameren Missouri. First, which capital structure should be used for the purpose of  
18 ratemaking in this proceeding: the parent company Ameren Corp.'s consolidated capital  
19 structure or the operation company Ameren Missouri's standalone capital structure? Second,  
20 what amount of short-term debt, if any, should be included in the ratemaking capital structure?  
21 For proper recommendation on these issues, Staff reviewed what the financial relationship

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<sup>76</sup> SEC Form 10-K.

<sup>77</sup> S&P Capital IQ Pro, retrieved June 24, 2022 (<https://www.capitaliq.spglobal.com>).

<sup>78</sup> S&P Capital IQ Pro.



1 between Ameren Missouri and Ameren Corp. is, and how Ameren Missouri's short-term debt  
2 was used. For regulatory consistency, Staff reviewed the Commission's previous decisions on  
3 these issues in Ameren Missouri rate cases.

4 Q. Please explain the Commission's past decisions regarding capital structures used  
5 for the purpose of ratemaking.

6 A. Over the past five years, there are four fully-litigated rate cases: three (3) Spire  
7 Missouri rate cases and the 2019 Empire Case. In Spire Missouri's general rate cases, Case  
8 Nos. GR-2017-0215, GR-2017-0216 and GR-2021-0108, the Commission ordered that Spire  
9 Missouri's standalone capital structure be used for the purpose of ratemaking. Regarding the  
10 issue of short-term debt in its capital structure, the Commission's decision in the 2021 Spire  
11 Case was that the average short-term debt in excess of short-term assets over the 13-month  
12 period, excluding both short-term assets and short-term debt related to Winter Storm Uri, should  
13 be included in the rate making capital structure.<sup>79</sup> In the 2019 Empire Case, the Commission  
14 found that it is appropriate to utilize Empire's consolidated capital structure, including its parent  
15 company's off balance sheet debt.<sup>80</sup>

16 Q. Please explain the financial relationship between Ameren Corp. and Ameren  
17 Missouri regarding capital structure for the purpose of ratemaking in this proceeding.

18 A. Ameren Missouri operates as an independent entity when considering Ameren  
19 Missouri's procurement of financing and the cost of that financing. Ameren Corp. is not the  
20 primary source of long-term financing for Ameren Missouri and this appears to continue to be

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<sup>79</sup> On page 96, *Amended Report and Order* issued November 12, 2021, in Case No. GR-2021-0108.

<sup>80</sup> On page 38-39, *Amended Report and Order* issued July 23, 2020, in Case No. ER-2019-0374.

1 the case.<sup>81</sup> Since January 2020, Ameren Missouri has not received long-term financing from  
2 Ameren Corp. or other Ameren Corp. subsidiaries.<sup>82</sup>

3 Ameren Missouri is an operating subsidiary of Ameren Corp. and has separate credit  
4 ratings issued by Moody's and S&P.<sup>83</sup> Ameren Missouri's stand-alone capital structure  
5 supports its own credit rating.<sup>84</sup> The debt is rated by credit rating agencies based on the  
6 stand-alone credit quality of Ameren Missouri.<sup>85</sup> Therefore, the cost of any debt that Ameren  
7 Missouri has will be based on Ameren Missouri's creditworthiness. The corporate credit ratings  
8 assigned by Moody's and S&P to both Ameren Missouri and Ameren Corp. are 'Baa1' and  
9 'BBB+', respectively.<sup>86</sup>

10 Ameren Corp. provides all equity and no debt financing to Ameren Missouri.<sup>87</sup> Ameren  
11 Corp. assets do not secure Ameren Missouri debt and Ameren Missouri assets do not secure  
12 Ameren Corp. debts.<sup>88</sup> Ameren Missouri receives or provides short-term advances from or to  
13 Ameren Corp. through its regulated money-pool.<sup>89</sup> The management members of Ameren  
14 Corp. are included as part of the ultimate financial decision makers for Ameren Missouri.<sup>90</sup>  
15 These financial relationships between Ameren Corp. and Ameren Missouri are normal in the  
16 utilities sector.

17 Ameren Corp. has not raised debt in order to contribute equity to Ameren Missouri.  
18 Ameren Missouri's common equity balance consists of common equity contributions from

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<sup>81</sup> Staff's Data Request No. 0187.

<sup>82</sup> No.1, Staff's Data Request No. 0196.

<sup>83</sup> S&P Capital IQ Pro.

<sup>84</sup> No.4, Staff's Data Request No. 0196.

<sup>85</sup> Rating Direct, S&P Capital IQ.

<sup>86</sup> S&P Capital IQ Pro.

<sup>87</sup> No.1, Staff's Data Request No. 0196.

<sup>88</sup> No.6, Staff's Data Request No. 0196.

<sup>89</sup> No.3, Staff's Data Request No. 0196.

<sup>90</sup> No.7, Staff's Data Request No. 0196.

1 Ameren Corp. and retained Ameren Missouri earnings.<sup>91</sup> Therefore, Staff does not find  
2 evidence that Ameren Corp. has used “double leverage” for investing in Ameren Missouri.<sup>92</sup>

3 In addition, Ameren Corp.’s non-utility assets are around 1.2% of its total assets.<sup>93</sup>  
4 Hence, there are no significant concerns about the financial relationship between Ameren  
5 Missouri’s regulated utility service and Ameren Corp.’s non-regulated business.

6 Q. What are the components of capital structure commonly considered for the  
7 purpose of ratemaking in general rate proceedings?

8 A. In general, a ratemaking capital structure could be a mixture of debt and  
9 equity including some or all of the following components: common stock, preferred stock,  
10 long-term debt, and short-term debt. For short-term debt, the portion of short-term debt that  
11 supports long-term capital may be included in the capital structure. In other words, the amount  
12 of short-term debt exceeding the amount to support short-term assets and construction work in  
13 progress (“CWIP”), may be considered a capital structure component.

14 Q. What was the Commission’s decision on short-term debt for the ratemaking  
15 capital structure in previous rate cases?

16 A. In Spire East and Spire West’s rate cases, Case Nos. GR-2017-0215 and  
17 GR-2017-0216, the Commission determined that short-term debt should not be included in  
18 Spire’s ratemaking capital structures when the average level of CWIP and other short-term  
19 assets exceeds the amount of short-term debt.<sup>94</sup> In Spire Missouri’s general rate case, Case No.

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<sup>91</sup> Staff’s Data Request No. 0196.1.

<sup>92</sup> Double leverage occurs when a holding company conducts a debt offering to acquire a large equity stake in a subsidiary. Financial authorities have frequently raised concerns about the issue of double leverage because of this type of intra-firm financing.

<sup>93</sup> No. 8, Staff’s Data Request No. 0196.

<sup>94</sup> On pages 44-45, *Amended Report and Order* issued March 17, 2018, in Case Nos. GR-2017-0215 and GR-2017-0216.

1 GR-2021-0108, the Commission determined that an appropriate amount of short-term debt  
2 should be included in Spire Missouri's ratemaking capital structure because Spire Missouri was  
3 using some short-term debt to finance long-term assets.<sup>95</sup>

4 Q. What is the average amount of Ameren Missouri short-term debt used to finance  
5 its long-term assets for a reasonable time-period?

6 A. Ending December 31, 2022, the 12-month average amount of Ameren  
7 Missouri's projected short-term debt and construction work in progress ("CWIP") are  
8 approximately \$183 million and \$879 million, respectively.<sup>96</sup> The short-term debt in the  
9 Ameren Missouri ratemaking capital structure is 0%. Staff will continue monitoring  
10 Ameren Missouri's short-term debt levels through the remainder of this proceeding and, if  
11 appropriate, will state any change in position on this capital structure issue no later than Staff's  
12 true-up direct testimony.

13 Q. Has Ameren Missouri and Ameren Corp. indicated to Staff that they would  
14 target specific capital structures in the future for Ameren Missouri and Ameren Corp.?

15 A. Ameren Missouri's response to Staff's Data Request No. 0192 says Ameren  
16 Missouri has neither internally identified nor externally communicated a targeted capital  
17 structure. As part of the expected 2022-2026 funding plan, Ameren Corp. targets a consolidated  
18 equity capitalization target of approximately 45%.<sup>97</sup>

19 Q. What is the actual capital structure of Ameren Missouri and Ameren Corp.?

20 A. The capital structure as of September 30, 2022 for Ameren Missouri is  
21 approximately 51.84% common equity, 0.66% preferred stock, and 47.50% long-term debt.<sup>98</sup>

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<sup>95</sup> On page 97, *Amended Report and Order* issued November 12, 2021, in Case No. GR-2021-0108.

<sup>96</sup> Schedule DTS-D3, Sagel's Direct Testimony.

<sup>97</sup> Staff's Data Request No. 0192.

<sup>98</sup> Schedule SJW-d6, Won's Direct Testimony.

1 Table 1 below shows the average capital structures of Ameren Corp. and Ameren Missouri  
2 for Q1 2020 through Q2 2022.<sup>99</sup> As seen in Table 1, the average equity ratios for Q1 2020  
3 through Q2 2022 were approximately 51.23% and 43.85% for Ameren Missouri and Ameren  
4 Corp., respectively.<sup>100</sup>

5 **Table 1. Comparison Average Capital Structure Q1 2020 – Q2 2022**

	<u>Ameren Missouri</u>	<u>Ameren Corp.</u>
Common Equity	51.20%	43.93%
Preferred Stock	0.79%	0.66%
Long-Term Debt	48.01%	55.41%
	100.00%	100.00%

6  
7 Q. What is Staff's recommended ratemaking capital structure in this proceeding?

8 A. Considering Ameren Missouri's financial relationship with Ameren Corp., also  
9 to be consistent with the Commission's previous ratemaking decisions, Staff recommends the  
10 Commission set Ameren Missouri's ROR based on Ameren Missouri's standalone capital  
11 structure. The capital structure Staff used for its analysis in this case is Ameren Missouri's  
12 stand-alone capital structure composed of 51.84% common equity, 0.66% preferred stock,  
13 and 47.50%, long-term debt, based on Ameren Missouri's actual capital structure as of  
14 September 30, 2022. Schedules SJW-5-1 and SJW-5-2 to this testimony, and incorporated by  
15 reference herein, presents Ameren Corp. and Ameren Missouri's historical capital structures  
16 and the associated capital ratios. Staff will keep monitoring Ameren Corp. and Ameren  
17 Missouri's updated capital structures through the end of the true-up period, through  
18 December 31, 2022, and will update its final recommendation to actual values at that time.

<sup>99</sup> *Amended Report and Order* issued November 12, 2021, in Case No. GR-2021-0108.

<sup>100</sup> Schedule SJW-d5-2, Won's Direct Testimony.

1 **VI. RATE OF RETURN**

2 Q. Please summarize the procedure that Staff used in its ROR analysis.

3 A. In order to arrive at Staff's recommended ROR, Staff employed the comparative  
4 COE analysis. Staff specifically examined and evaluated: (1) the estimated COEs in the current  
5 Ameren Missouri rate case and those from the 2019 Empire Case time-period; (2) the authorized  
6 ROE approved by the Commission in the 2019 Empire Case; (3) the current embedded cost of  
7 debt and cost of preferred stock; and (4) the allowed ROR for ratemaking in this proceeding.  
8 For this procedure, Staff started with the selection of an electric proxy group.

9 **1. Proxy Group**

10 Q. How did you select the electric proxy group for the comparative COE analysis?

11 A. Staff used a proxy group consisting of U.S. utilities that the Edison Electric  
12 Institute classifies as Electric Utilities. Staff screened thirty-eight (38) companies (see Schedule  
13 SJW-d9) for the following criteria:

- 14 • Stock publicly traded;
- 15 • 80% of assets U.S. regulated;
- 16 • At least investment grade credit rating;
- 17 • Long-term growth rates from at least two sources;
- 18 • Positive dividend payout since 2018;
- 19 • At least 60% of regulated income from electric utility operations;
- 20 • At least 50% of plant from electric utility; and
- 21 • No pending merger or acquisitions.

22 Q. What is Staff's electric proxy group for the comparative COE analysis?

23 A. The thirteen (13) electric utilities that met these criteria are in Table 2 below:

1

**Table 2. Electric Utility Proxy Group**

Electric Utility Companies	Ticker
Alliant Energy Corporation	LNT
Ameren Corporation	AEE
American Electric Power Company, Inc.	AEP
Avista Corporation	AVA
CMS Energy Corporation	CMS
Duke Energy Corporation	DUK
Entergy Corporation	ETR
IDACORP, Inc.	IDA
Northwestern Corporation	N W E
Pinnacle West Capital Corporation	PNW
Portland General Electric Company	POR
The Southern Company	SO
Xcel Energy Inc.	XEL

2

3           **2. Cost of Common Equity - DCF**

4           Q. Please explain how Staff conducted its comparative COE analysis.

5           A. Staff conducted its COE analysis for Ameren Missouri by comparing the change  
6 in the COE analysis between the fourth quarter of 2019 (the reference time period of the 2019  
7 Empire Case) and the third quarter of 2022 using the same proxy group of electric utility  
8 companies as shown in Table 2. The analysis Staff used to determine Ameren Missouri's COE  
9 consisted of Staff's DCF COE analysis, CAPM COE analysis, and RPM COE analysis. These  
10 three analyses are widely accepted in the financial industry as a means to determine a fair and  
11 reasonable rate of return for regulated utility companies.<sup>101</sup>

12           Staff determined that the DCF COE comparative analysis is the most proper analysis to  
13 use in this case to recommend a just and reasonable ROE to the Commission for Ameren  
14 Missouri. Staff estimated the COE for each time-period and the COE change over time using

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<sup>101</sup> FERC ¶ 61,154, *order on reh'g*, Opinion No. 569-B, 173 FERC ¶ 61,159 (2020).

1 its DCF COE comparative analysis. Staff then compared the result of its DCF COE analysis to  
2 the result of its CAPM COE analysis and RPM COE analysis to test for reasonableness. Staff  
3 then compared the result of its current DCF COE estimate to the 2019 Empire Case’s DCF COE  
4 estimate. Comparing these DCF COE estimates allowed Staff to recommend a range of  
5 authorized ROE.

6 Q. Please explain the DCF model used for Staff’s COE comparative analysis.

7 A. The DCF model used for Staff’s COE comparative analysis is a widely used  
8 model by investors to evaluate stable-growth investment opportunities, such as regulated utility  
9 companies. The premise of the DCF model is that an investment in common stock is worth the  
10 present value of the infinite stream of dividends discounted at a market rate commensurate with  
11 the investment’s risk. Using the following formula for the DCF model, investors determine a  
12 common stock price:

$$P = D/(k - g),$$

14 where  $P$  is the common stock price,  
15  $D$  is the current dividend,  
16  $k$  is investors’ required return from the stock, and  
17  $g$  is the expected growth rate in dividends.

18 Staff uses an adjusted dividend yield  $(1 + .5g)D$  to account for the fact that the  
19 dividends are paid on a quarterly basis.<sup>102</sup> For the growth rate, Staff used the average of  
20 analysts’ projected earnings per share (“EPS”), dividends per share (“DPS”), and book value  
21 per share (“BVPS”) and the projected nominal GDP growth rate (see Schedule SJW-d11).<sup>103</sup>

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<sup>102</sup> *Ass’n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.*, Opinion No. 569, 169 FERC ¶ 61,129 (2019).

<sup>103</sup> *Entergy Arkansas, Inc.*, Opinion No. 575, 175 FERC ¶ 61,136 (2021).



1 It is important that the perpetual growth rate used in Staff’s constant-growth DCF model  
2 reflects the long-term investment horizon assumption implied in the constant-growth DCF  
3 model. The Federal Energy Regulatory Commission (“FERC”) also agreed as much when it  
4 ruled, in Opinion 569, that exclusive use of short-term analysts’ growth rates in the  
5 constant-growth DCF was inappropriate.<sup>104</sup> The formulation of the COE using the  
6 constant-growth DCF formula is:

$$k = (1 + .5g)D / P + g.$$

8 Q. What is the result of the comparative COE analysis using the DCF model?

9 A. For the current rate case, the DCF COE for the proxy group is in the range of  
10 7.30% to 8.79%, with a proxy group average of 8.04% (see Schedule SJW-d13). For the 2019  
11 Empire Case, Staff recalculated COE using the DCF model and using the same proxy group of  
12 electric utility companies in Table 2. The 2019 recalculation resulted in a DCF COE in the  
13 range of 7.00% to 8.42%, with a proxy group average of 7.71% (see Schedule SJW-d13). Based  
14 on a comparative DCF analysis, the COE estimate has increased by approximately 34 basis  
15 points from the last 2019 Empire Case.<sup>105</sup>

16 **3. Cost of Common Equity - CAPM**

17 Q. Please explain the CAPM used for Staff’s COE comparative analysis.

18 A. The CAPM is built on the premise that the variance in returns over time is the  
19 appropriate measure of risk, but only the non-diversifiable variance (systematic risk) is  
20 rewarded. Systematic risks, also called market risks, are unanticipated events that affect almost

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<sup>104</sup> *Ass’n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.*, Opinion No. 569, 169 FERC ¶ 61,129 (2019).

<sup>105</sup> Considering the decimal number rounding, it is 34 basis points, not 33 basis points.

1 all assets to some degree because the effects are economy wide. Systematic risk in an asset,  
2 relative to the average, is measured by the beta of that asset.<sup>106</sup> Unsystematic risks, also called  
3 asset-specific risks, are unanticipated events that affect single assets or small groups of assets.  
4 Because unsystematic risks can be freely eliminated by diversification, the appropriate reward  
5 for bearing risk depends on the level of systematic risk.

6 The CAPM shows that the expected return for a particular asset depends on the pure  
7 time value of money (measured by the risk free rate), the amount of the reward for bearing  
8 systematic risk (measured by the market risk premium (“MRP”)), and the amount of systematic  
9 risk incurred by the asset (measured by beta). Specifically, the CAPM methodology estimates  
10 the cost of equity by taking the risk-free rate and adding the MRP multiplied by beta.<sup>107</sup>  
11 The MRP is calculated by subtracting the risk-free rate from the expected market return.  
12 The general form of the CAPM is as follows:

$$k = R_f + \beta(R_m - R_f)$$

13  
14 where,  $k$  is the expected return on equity for a security,  
15  $R_f$  is the risk-free rate,  
16  $R_m$  is the expected market return,  
17  $\beta$  is beta, and  
18  $R_m - R_f$  is the MRP.

19 For the risk-free rate, Staff used the average yield on 30-year U.S. Treasury bonds for  
20 the three-month period ending September 30, 2022, which was 3.26%.<sup>108</sup> For Staff’s CAPM  
21 analysis, it relied on betas provided by Value Line.<sup>109</sup> For the MRP estimate, Staff relied on

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<sup>106</sup> Beta is a measure of the volatility—or systematic risk—of a security or portfolio compared to the market as a whole. (Investopedia, retrieved November 5, 2020), <https://www.investopedia.com/terms/b/beta.asp>.

<sup>107</sup> Roger A. Morin, New Regulatory Finance (Public Utilities Reports, Inc. 2006).

<sup>108</sup> Schedule SJW-d4-2, Won’s Direct Testimony.

<sup>109</sup> Value Line, <https://valueline.com/?msclkid=4ed36370d16911eca58154b129389016>.

1 four sets of data. The first data set is the long-term geometric mean of historical return  
2 differences between large company stocks and long-term government bonds from 1926-2021,  
3 resulting in an MRP estimate of 4.61%.<sup>110</sup> The second data set is the long-term arithmetic mean  
4 of historical return differences between large company stocks and long-term government bonds  
5 from 1926-2021, resulting in an MRP estimate of 6.03%.<sup>111</sup> The third data set is the long-term  
6 geometric mean of historical return differences between S&P 500 and long-term government  
7 bonds from 1928-2021, resulting in an MRP estimate of 5.13%.<sup>112</sup> The fourth data set is the  
8 long-term arithmetic mean of historical return differences between S&P 500 and long-term  
9 government bonds from 1928-2021, resulting in an MRP estimate of 6.71%.<sup>113</sup>

10 Q. What is the result of the comparative COE analysis using the CAPM method?

11 A. The proxy group CAPM analysis resulted in a CAPM COE within the range of  
12 7.23% to 9.04% for the current rate case (see Schedule SJW-d14) that supports Staff's DCF  
13 COE estimate of 8.04% in the range of 7.30% to 8.79% for the current rate case.

14 **4. Cost of Common Equity - RPM**

15 Q. Did Staff test the reasonableness of its COE estimates using any other methods?

16 A. Yes. Staff used the RPM to test the reasonableness of its COE estimates.  
17 The RPM or bond yield plus risk premium method, called the "rule of thumb" test of  
18 reasonableness in the CFA study guide, estimates the COE by simply adding an equity risk  
19 premium ("ERP") to the yield-to-maturity ("YTM") of the subject company's long-term

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<sup>110</sup> CFA Institute, Stocks, Bonds, Bills, and Inflation (SBBI) Data,  
<https://www.cfainstitute.org/en/research/foundation/sbbi>.

<sup>111</sup> Ibid.

<sup>112</sup> Risk Premium, Damodaran Online, Stern School of Business, NYU.  
<https://pages.stern.nyu.edu/adamodar/>.

<sup>113</sup> Ibid.

1 debt.<sup>114</sup> Considering unusually high interest rates that are inversely related inversely to ERP,<sup>115</sup>  
2 the current electric proxy group ERP is approximately in the range of 3% to 4%.<sup>116</sup> For the  
3 three months ended through September 30, 2022, “A” rated and “Baa” rated long-term utility  
4 bonds had average yields of 4.94% and 5.28%, respectively.<sup>117</sup> Adding the 3% to 4% risk  
5 premium, the “rule of thumb” indicates a COE between 7.94% and 9.28%. To the extent that  
6 the RPM COE estimate’s range overlaps Staff’s DCF COE estimate range of 7.30% to 8.79%,  
7 the RPM COE estimate’s range of 7.94% to 9.28% supports the reasonableness of Staff’s COE  
8 estimate of 8.04%.

## 9 5. Return on Equity

10 Q. Please explain the methodology used by Staff to determine its recommended  
11 authorized ROE in this proceeding.

12 A. In the 2019 Empire Case, the Commission authorized an ROE of 9.25%.<sup>118</sup>  
13 Based on the result of Staff’s DCF analysis for the 2019 Empire Case, the COE was 7.71%  
14 within a range of 7.00% to 8.42%. With the same proxy group, Staff’s DCF analysis in the  
15 current Ameren Missouri rate cases result in a COE of 8.04% with a range of 7.30% to 8.79%.<sup>119</sup>  
16 The difference between the two COEs is an increase of approximately 34 basis points since the  
17 2019 Empire Case. If there is no significant change in the Commission’s perspectives on the  
18 relationship between the COE estimate and the authorized ROE, it is reasonable to conclude

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<sup>114</sup> Stowe, J. D., Robinson, T. R., Pinto, J. E., & McLeavey, D. W. (2002) Analysis of Equity Investment: Valuation. Association for Investment Management and Research.

<sup>115</sup> Brigham, E. F., Shome, D. K., & Vinson, S. R. (1985). The risk premium approach to measuring a utility's cost of equity. Financial Management, 33-45.

<sup>116</sup> Roger A. Morin, New Regulatory Finance (Public Utilities Reports, Inc. 2006), and Baa Default Spread on 1/1/22 Median value of (ERP/ Default Spread), Equity Risk Premiums (ERP): Determinants, Estimation, and Implications – The 2022 Edition, Updated: March 23, 2022, Aswath Damodaran, Stern School of Business, <https://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERP2022Formatted.pdf>.

<sup>117</sup> Mergent Bond Record.

<sup>118</sup> On page 38, *Amended Report and Order* issued July 23, 2020, in Case No. ER-2019-0374.

<sup>119</sup> Schedule SJW-d15, Won’s Direct Testimony.

1 that the current electric utility ROE should be approximately 34 basis points higher than the  
2 authorized ROE of 9.25% in the 2019 Empire Case. This results in a recommended ROE of  
3 9.59% for this proceeding.

4 To recommend a just and reasonable ROE, Staff considered Ameren Missouri's unique  
5 risk profiles and the current financial and economic market conditions. The current U.S.  
6 inflation rate is at its highest level in 40 years.<sup>120</sup> The Fed previously forecasted that a higher  
7 inflation rate reflected "transitory" factors but not anymore.<sup>121</sup> To combat inflation, the Fed  
8 started to increase interest rates as Fed Chair Powell announced interest rate increases in  
9 2022.<sup>122</sup> The most recent meeting of the FOMC anticipates that ongoing increases in the target  
10 range for the federal funds rate will be appropriate.<sup>123</sup> Considering all of the above information  
11 that Staff has reviewed, Staff recommends the Commission authorize an ROE of 9.59% for  
12 Ameren Missouri in this proceeding.

13 Q. Does Staff have any supporting evidence that the Commission can consider to  
14 determine the reasonableness of Staff's ROE recommendation?

15 A. Yes. Staff recognizes that the Commission may be interested in recent  
16 authorized ROEs for other electric utility companies in the U.S. as a test of reasonableness of  
17 Staff's recommendation of authorized ROE. Table 3 presents information compiled and  
18 published by the Regulatory Research Associates ("RRA") which details the average fully

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<sup>120</sup> BBC News, US inflation hits highest level for nearly 40 years, published December 10, 2021,  
<https://www.bbc.co.uk/news/business-59573145>.

<sup>121</sup> Federal Reserve, Press Release, March 16, 2022,  
<https://www.federalreserve.gov/monetarypolicy/files/monetary20220316a1.pdf>.

<sup>122</sup> Transcript of Chair Powell's Press Conference, December 15, 2021.

<sup>123</sup> Federal Reserve issues Minutes of the Federal Open Market Committee, released November 23, 2022, and,  
retrieved November 24, 2022, <https://www.federalreserve.gov/monetarypolicy/files/fomcminutes20221102.pdf>.

litigated and settled authorized ROE's from Commissions around the U.S. in the years 2010 - 2022 along with the number of cases considered:

**Table 3: Authorized ROE's from Commissions in the U.S. (2010-2022)<sup>124</sup>**

Year	<u>Fully Litigated</u>		<u>Electric Utility Settled</u>		<u>Electric Total</u>	
	ROE (%)	Case (No.)	ROE (%)	Case (No.)	ROE (%)	Case (No.)
2010	10.35	27	10.39	34	10.37	61
2011	10.39	26	10.12	16	10.29	42
2012	10.28	29	10.06	29	10.17	58
2013	9.85	17	10.12	32	10.03	49
2014	10.05	21	9.73	17	9.91	38
2015	9.66	16	10.04	15	9.84	31
2016	9.74	25	9.80	17	9.77	42
2017	9.73	24	9.75	29	9.74	53
2018	9.63	22	9.57	26	9.60	48
2019	9.58	27	9.76	20	9.66	47
2020	9.43	32	9.46	23	9.44	55
2021	9.22	30	9.57	25	9.38	55
2022	9.49	34	9.64	20	9.55	54

In 2022 to date, the average authorized ROE of electric utilities for fully-litigated and settled cases is 9.49% and 9.64%, respectively, for an overall average of 9.55%. Considering the current trend of inclining interest rates, Staff's recommended authorized ROE of 9.59% is generally consistent with ROEs recently authorized for other utilities around the country. It is Staff's position that, in order for Ameren Missouri to be competitive on the capital market, it needs to have the opportunity to earn an ROE that is reasonably consistent with ROEs awarded to other utilities around the country.

<sup>124</sup> S&P Capital IQ Pro: Regulatory Research Association, retrieved December 2, 2022.

1           **6.       Costs of Preferred Stock**

2           Q.       What cost of preferred stock should the Commission authorize for Ameren  
3 Missouri in this proceeding?

4           A.       The cost of preferred stock the Commission should authorize for Ameren  
5 Missouri in this proceeding is Ameren Missouri's cost of preferred stock, as of September 30,  
6 2021, of 4.18%.<sup>125</sup> Staff will update its cost of preferred stock throughout this proceeding  
7 through the true-up period, as actual information becomes available.

8           **7.       Costs of Debt**

9           Q.       What cost of debt should the Commission authorize for Ameren Missouri in this  
10 proceeding?

11          A.       The cost of debt the Commission should authorize for Ameren Missouri in this  
12 proceeding is Ameren Missouri's embedded cost of debt, as of September 30, 2021, of  
13 3.92%.<sup>126</sup> Staff will update its embedded cost of debt throughout this proceeding through the  
14 true-up period, as actual information becomes available.

15       **VII. CONCLUSION**

16          Q.       What is the conclusion of your direct testimony?

17          A.       Considering the current economic and financial market conditions, particularly  
18 including the surge in the inflation rate and interest rates, and Ameren Missouri's risk profile,  
19 Staff's comparative COE analysis supports a just and reasonable ROE of 9.59%, the mid-point  
20 in a range of 9.34% to 9.84% for Ameren Missouri. Because of the rapidly changing economic

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<sup>125</sup> Staff's Data Request No. 0187.

<sup>126</sup> Ibid.

1 outlook, Staff will update its ROE if there are significant changes in the economic outlook that  
2 necessitate an update.

3 Staff's recommended ROE of 9.59% for Ameren Missouri and cost of preferred stock  
4 of 4.18% and cost of debt of 3.92% applied to a capital structure of 51.84% common equity,  
5 0.66% preferred stock and 47.50% long-term debt, results in an allowed ROR of 6.86%.<sup>127</sup>  
6 Staff will continue to monitor Ameren Corp. and Ameren Missouri's capital structure and cost  
7 of debt through the true-up period and will make its final recommendation at that time.

8 Q. Does this conclude your direct testimony?

9 A. Yes, it does.

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<sup>127</sup> Schedule SJW-d16, Won's Direct Testimony.



**BEFORE THE PUBLIC SERVICE COMMISSION**  
**OF THE STATE OF MISSOURI**

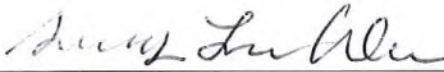
In the Matter of Union Electric Company            )  
d/b/a Ameren Missouri's Tariffs to Adjust        )  
Its Revenues for Electric Service                )            Case No. ER-2022-0337

**AFFIDAVIT OF SEOUNG JOUN WON, PhD**

STATE OF MISSOURI        )  
                                      )        ss.  
COUNTY OF COLE         )

**COMES NOW SEOUNG JOUN WON, PhD** and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Direct Testimony of Seoung Joun Won, PhD*; and that the same is true and correct according to his best knowledge and belief.

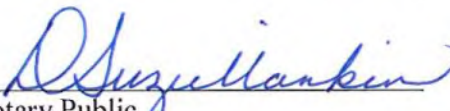
Further the Affiant sayeth not.

  
\_\_\_\_\_  
**SEOUNG JOUN WON, PhD**

**JURAT**

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 5<sup>th</sup> day of January 2023.

D. SUZIE MANKIN Notary Public - Notary Seal State of Missouri Commissioned for Cole County My Commission Expires: April 04, 2025 Commission Number: 12412070
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\_\_\_\_\_  
Notary Public

## **Credentials and Background of**

### **Seoung Joun Won, PhD**

I am currently employed as a Regulatory Compliance Manager in the Financial Analysis Department of the Financial and Business Analysis Division of the Missouri Public Service Commission. I have been employed at the Missouri Public Service Commission since May 2010.

I received my Bachelor of Arts, Master of Arts, and Doctor of Philosophy in Mathematics from Yonsei University and my Bachelor of Business Administration in Financial Accounting from Seoul Digital University in Seoul, South Korea, and earned my Doctor of Philosophy in Economics from the University of Missouri - Columbia. Also, I passed several certificate examinations for Finance Specialist in South Korea such as Accounting Management, Financial Risk Manager, Enterprise Resource Planning Accounting Consultant, Derivatives Investment Advisor, Securities Investment Advisor, and Financial Planner.

Prior to joining the Commission, I taught both undergraduate and graduate level mathematics at the Korean Air Force Academy and Yonsei University for 13 years. I served as the director of the Education and Technology Research Center in NeoEdu for 5 years. Before starting my current position at the Missouri Public Service Commission, I had served as a regulatory economist in Tariff/Rate Design Department.

My current duties at the Commission include financial analysis of rate of return and cost of equity, valuation analysis on merger and acquisition, due diligence review and supporting economic and statistical analysis.

## List of Previous Testimony Filed

### Seoung Joun Won, PhD

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
EA-2022-0245	Union Electric Co., d/b/a Ameren Missouri	Financial Capability
EA-2022-0244	Union Electric Co., d/b/a Ameren Missouri	Financial Capability
EA-2022-0234	NextEra Energy Transmission Southwest, LLC	Financial Capability
ER-2022-0129	Evergy Missouri Metro	Rate of Return, Capital Structure
GR-2021-0320	Empire District Gas Company	Rate of Return, Capital Structure
GF-2022- 0169	Spire Missouri, Inc.	Financing Authority
EF-2022-0164	Union Electric Co., d/b/a Ameren Missouri	Financing Authority
WF-2022-0161	Missouri-American Water Company	Financing Authority
EF-2022- 0103	Evergy Missouri West, Inc.	Financing Authority
WF-2021-0427	Raytown Water Company	Financing Authority
ER-2021-0312	Empire District Electric Company	Rate of Return, Capital Structure
WF-2022-0066	Missouri American Water Company	Financing Authority
GR-2021-0241	Union Electric Co., d/b/a Ameren Missouri	Rate of Return, Capital Structure
ER-2021-0240	Union Electric Co., d/b/a Ameren Missouri	Rate of Return, Capital Structure
GR-2021-0108	Spire Missouri, Inc.	Rate of Return, Capital Structure
EA-2021-0087	Ameren Transmission Company of Illinois	Financial Capability

cont'd List of Previous Testimony Filed

**Seoung Joun Won, PhD**

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
EA-2020-0371	Union Electric Co., d/b/a Ameren Missouri	Financial Capability
SR-2020-0345	Missouri American Water Company	Rate of Return, Capital Structure
WR-2020-0344	Missouri American Water Company	Rate of Return, Capital Structure
EF-2020-0301	Evergy Missouri Metro	Financing Authority
WR-2020-0264	Raytown Water Company	Rate of Return, Capital Structure
WR-2020-0053	Confluence Rivers Utility Operating Company, Inc.	Rate of Return, Capital Structure
HM-2020-0039	Veolia Energy Kansas City, Inc. AIP Project Franklin Bidco	Merger and Acquisition
EO-2019-0133	KCP&L Greater Missouri Operations Company, Evergy Metro	Business Process Efficiency
EO-2019-0132	Kansas City Power & Light Company, Evergy Metro	Business Process Efficiency
GO-2019-0059	Spire West, Spire Missouri, Inc.	Weather Variables
GO-2019-0058	Spire East., Spire Missouri, Inc.	Weather Variables
ER-2018-0146	KCP&L Greater Missouri Operations Co.	Weather & Normalization, Net System Input
ER-2018-0145	Kansas City Power & Light Co.	Weather & Normalization, Net System Input
GR-2018-0013	Liberty Utilities (Midstates Natural Gas) Corp.	Weather Variables
GR-2017-0216	Missouri Gas Energy (Laclede), Spire Missouri, Inc.	Weather Variables
GR-2017-0215	Laclede Gas Co., Spire Missouri, Inc.	Weather Variables
ER-2016-0285	Kansas City Power & Light Co.	Weather & Normalization, Net System Input

cont'd List of Previous Testimony Filed

**Seoung Joun Won, PhD**

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
ER-2016-0179	Union Electric Co., d/b/a Ameren Missouri	Weather & Normalization, Net System Input
ER-2016-0156	KCP&L Greater Missouri Operations Co.	Weather & Normalization, Net System Input
ER-2016-0023	Empire District Electric Company	Weather & Normalization, Net System Input
ER-2014-0370	Kansas City Power & Light Co	Weather & Normalization, Net System Input
ER-2014-0351	Empire District Electric Company	Weather & Normalization, Net System Input
ER-2014-0258	Union Electric Co., d/b/a Ameren Missouri	Weather & Normalization, Net System Input
EC-2014-0223	Noranda Aluminum, Inc., et al, Complaint v. Union Electric Co., d/b/a Ameren Missouri	Weather Variables
GR-2014-0152	Liberty Utilities (Midstates Natural Gas) Corp.	Weather Variables
GR-2014-0086	Summit Natural Gas of Missouri, Inc.	Weather Variables
HR-2014-0066	Veolia Energy Kansas City, Inc.	Weather Variables, Revenue
GR-2013-0171	Laclede Gas Co.	Weather Variables
ER-2012-0345	Empire District Electric Company	Weather Variables, Revenue
ER-2012-0175	KCP&L Greater Missouri Operations Co.	Weather Variables
ER-2012-0174	Kansas City Power & Light Co.	Weather Variables
ER-2012-0166	Union Electric Co., d/b/a Ameren Missouri	Weather Variables, Revenue
HR-2011-0241	Veolia Energy Kansas City, Inc.	Weather Variables
ER-2011-0028	Union Electric Co., d/b/a Ameren Missouri	Weather Variables, Revenue

cont'd List of Previous Testimony Filed

**Seoung Joun Won, PhD**

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
ER-2011-0004	Empire District Electric Company	Weather Variables, Revenue
GR-2010-0363	Union Electric Co., d/b/a Ameren Missouri	Weather Variables
ER-2010-0356	KCP&L Greater Missouri Operations Co.	Weather Variables
ER-2010-0355	Kansas City Power & Light Co.	Weather Variables, Revenue

**Work Related Publication**

Won, Seoung Joun, X. Henry Wang, and Henry E. Warren. "Climate normals and weather normalization for utility regulation." *Energy Economics* (2016).

**DIRECT TESTIMONY**

**FOR**

**UNION ELECTRIC COMPANY,**

**d/b/a**

**AMEREN MISSOURI**

**CASE NO. ER-2022-0337**

**APPENDIX 2**

**SCHEDULES**

**BY**

**Seoung Joun Won, PhD**

**Financial Analysis**

**MISSOURI PUBLIC SERVICE COMMISSION**

**January 10, 2023**

**Ameren Missouri**  
**Case No. ER-2022-0337**

**List of Schedules**

<b>Schedules</b>	<b>Description of Schedules</b>
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**Federal Reserve Discount Rate and Federal Reserve Funds Rate**

<b>Date</b>	<b>Federal Reserve Discount Rate</b>	<b>Federal Reserve Funds Rate</b>	<b>Date</b>	<b>Federal Reserve Discount Rate</b>	<b>Federal Reserve Funds Rate</b>	<b>Date</b>	<b>Federal Reserve Discount Rate</b>	<b>Federal Reserve Funds Rate</b>
1-Jan	5.52	5.50	6-Jan	5.50	4.50	11-Jan	0.75	0.13
1-Feb	5.00	5.50	6-Feb	5.50	4.50	11-Feb	0.75	0.13
1-Mar	4.81	5.00	6-Mar	5.75	4.75	11-Mar	0.75	0.13
1-Apr	4.28	4.50	6-Apr	5.75	4.75	11-Apr	0.75	0.13
1-May	3.73	4.00	6-May	6.00	5.00	11-May	0.75	0.13
1-Jun	3.47	3.75	6-Jun	6.25	5.25	11-Jun	0.75	0.13
1-Jul	3.25	3.75	6-Jul	6.25	5.25	11-Jul	0.75	0.13
1-Aug	3.16	3.50	6-Aug	6.25	5.25	11-Aug	0.75	0.13
1-Sep	2.77	3.00	6-Sep	6.25	5.25	11-Sep	0.75	0.13
1-Oct	2.02	2.50	6-Oct	6.25	5.25	11-Oct	0.75	0.13
1-Nov	1.58	2.00	6-Nov	6.25	5.25	11-Nov	0.75	0.13
1-Dec	1.33	1.75	6-Dec	6.25	5.25	11-Dec	0.75	0.13
2-Jan	1.25	1.75	7-Jan	6.25	5.25	12-Jan	0.75	0.13
2-Feb	1.25	1.75	7-Feb	6.25	5.25	12-Feb	0.75	0.13
2-Mar	1.25	1.75	7-Mar	6.25	5.25	12-Mar	0.75	0.13
2-Apr	1.25	1.75	7-Apr	6.25	5.25	12-Apr	0.75	0.13
2-May	1.25	1.75	7-May	6.25	5.25	12-May	0.75	0.13
2-Jun	1.25	1.75	7-Jun	6.25	5.25	12-Jun	0.75	0.13
2-Jul	1.25	1.75	7-Jul	6.25	5.25	12-Jul	0.75	0.13
2-Aug	1.25	1.75	7-Aug	5.75	5.25	12-Aug	0.75	0.13
2-Sep	1.25	1.75	7-Sep	5.25	4.75	12-Sep	0.75	0.13
2-Oct	1.25	1.75	7-Oct	5.00	4.75	12-Oct	0.75	0.13
2-Nov	0.83	1.25	7-Nov	5.00	4.50	12-Nov	0.75	0.13
2-Dec	0.75	1.25	7-Dec	4.75	4.25	12-Dec	0.75	0.13
3-Jan	2.25	1.25	8-Jan	3.50	3.50	13-Jan	0.75	0.13
3-Feb	2.25	1.25	8-Feb	3.50	3.00	13-Feb	0.75	0.13
3-Mar	2.25	1.25	8-Mar	2.50	2.25	13-Mar	0.75	0.13
3-Apr	2.25	1.25	8-Apr	2.25	2.25	13-Apr	0.75	0.13
3-May	2.25	1.25	8-May	2.25	2.00	13-May	0.75	0.13
3-Jun	2.00	1.25	8-Jun	2.25	2.00	13-Jun	0.75	0.13
3-Jul	2.00	1.00	8-Jul	2.25	2.00	13-Jul	0.75	0.13
3-Aug	2.00	1.00	8-Aug	2.25	2.00	13-Aug	0.75	0.13
3-Sep	2.00	1.00	8-Sep	2.25	2.00	13-Sep	0.75	0.13
3-Oct	2.00	1.00	8-Oct	1.25	1.25	13-Oct	0.75	0.13
3-Nov	2.00	1.00	8-Nov	1.25	1.25	13-Nov	0.75	0.13
3-Dec	2.00	1.00	8-Dec	0.50	0.13	13-Dec	0.75	0.13
4-Jan	2.00	1.00	9-Jan	0.50	0.13	14-Jan	0.75	0.13
4-Feb	2.00	1.00	9-Feb	0.50	0.13	14-Feb	0.75	0.13
4-Mar	2.00	1.00	9-Mar	0.50	0.13	14-Mar	0.75	0.13
4-Apr	2.00	1.00	9-Apr	0.50	0.13	14-Apr	0.75	0.13
4-May	2.00	1.00	9-May	0.50	0.13	14-May	0.75	0.13
4-Jun	2.25	1.00	9-Jun	0.50	0.13	14-Jun	0.75	0.13
4-Jul	2.25	1.25	9-Jul	0.50	0.13	14-Jul	0.75	0.13
4-Aug	2.50	1.50	9-Aug	0.50	0.13	14-Aug	0.75	0.13
4-Sep	2.75	1.50	9-Sep	0.50	0.13	14-Sep	0.75	0.13
4-Oct	2.75	1.75	9-Oct	0.50	0.13	14-Oct	0.75	0.13
4-Nov	3.00	2.00	9-Nov	0.50	0.13	14-Nov	0.75	0.13
4-Dec	3.25	2.25	9-Dec	0.50	0.13	14-Dec	0.75	0.13
5-Jan	3.25	2.25	10-Jan	0.50	0.13	15-Jan	0.75	0.13
5-Feb	3.50	2.50	10-Feb	0.75	0.13	15-Feb	0.75	0.13
5-Mar	3.75	2.50	10-Mar	0.75	0.13	15-Mar	0.75	0.13
5-Apr	3.75	2.75	10-Apr	0.75	0.13	15-Apr	0.75	0.13
5-May	4.00	3.00	10-May	0.75	0.13	15-May	0.75	0.13
5-Jun	4.25	3.00	10-Jun	0.75	0.13	15-Jun	0.75	0.13
5-Jul	4.25	3.25	10-Jul	0.75	0.13	15-Jul	0.75	0.13
5-Aug	4.50	3.50	10-Aug	0.75	0.13	15-Aug	0.75	0.13
5-Sep	4.75	3.75	10-Sep	0.75	0.13	15-Sep	0.75	0.13
5-Oct	4.75	3.75	10-Oct	0.75	0.13	15-Oct	0.75	0.13
5-Nov	5.00	4.00	10-Nov	0.75	0.13	15-Nov	0.75	0.13
5-Dec	5.25	4.25	10-Dec	0.75	0.13	15-Dec	1.00	0.38

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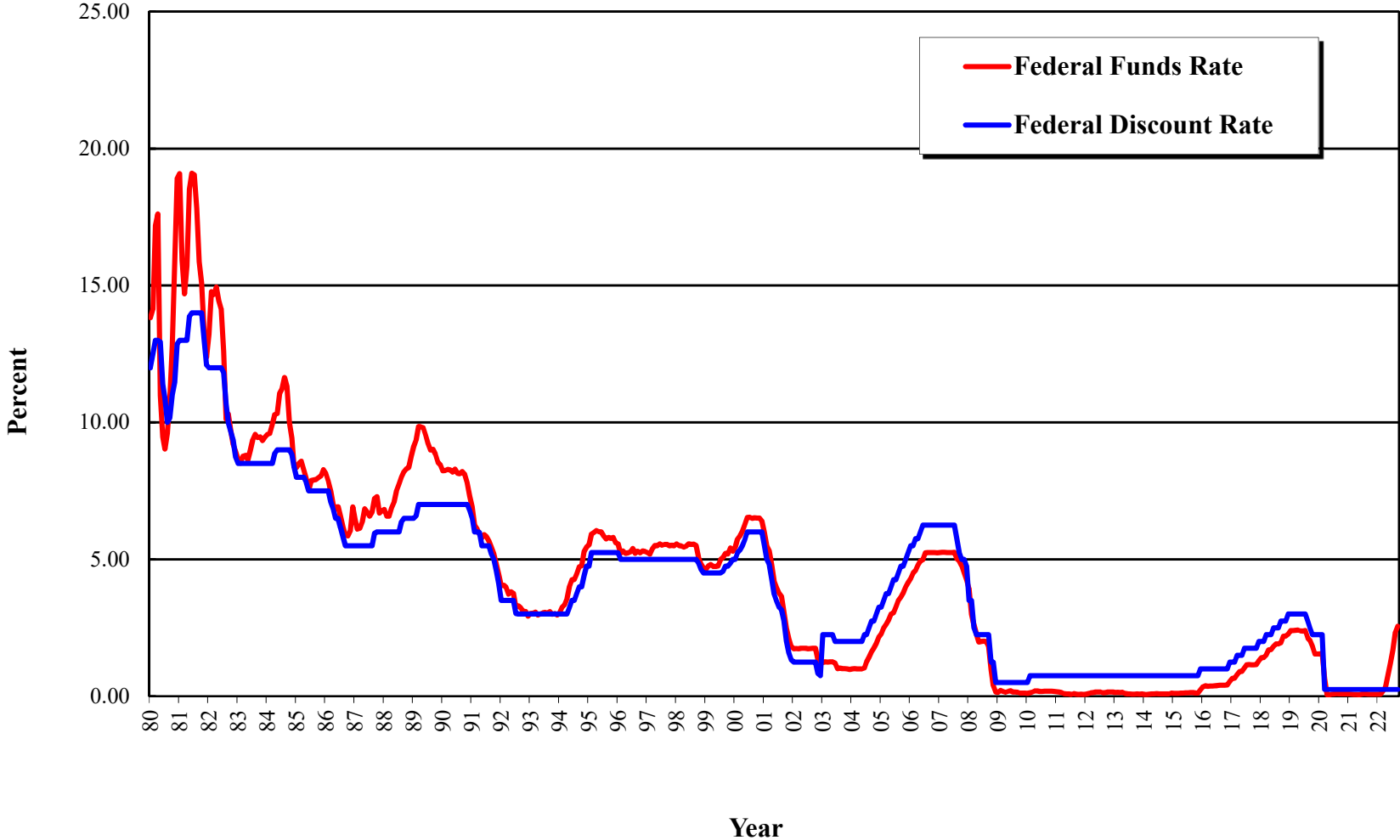
**Federal Reserve Discount Rate and Federal Reserve Funds Rate**

<b>Date</b>	<b>Federal Reserve Discount Rate</b>	<b>Federal Reserve Funds Rate</b>	<b>Date</b>	<b>Federal Reserve Discount Rate</b>	<b>Federal Reserve Funds Rate</b>
16-Jan	1.00	0.38	20-Jan	2.25	1.55
16-Feb	1.00	0.38	20-Feb	2.25	1.58
16-Mar	1.00	0.38	20-Mar	0.25	0.65
16-Apr	1.00	0.38	20-Apr	0.25	0.05
16-May	1.00	0.38	20-May	0.25	0.05
16-Jun	1.00	0.38	20-Jun	0.25	0.08
16-Jul	1.00	0.39	20-Jul	0.25	0.09
16-Aug	1.00	0.40	20-Aug	0.25	0.10
16-Sep	1.00	0.40	20-Sep	0.25	0.09
16-Oct	1.00	0.40	20-Oct	0.25	0.09
16-Nov	1.00	0.41	20-Nov	0.25	0.09
16-Dec	1.25	0.54	20-Dec	0.25	0.09
17-Jan	1.25	0.65	21-Jan	0.25	0.09
17-Feb	1.25	0.66	21-Feb	0.25	0.08
17-Mar	1.50	0.79	21-Mar	0.25	0.07
17-Apr	1.50	0.90	21-Apr	0.25	0.07
17-May	1.50	0.91	21-May	0.25	0.06
17-Jun	1.75	1.04	21-Jun	0.25	0.08
17-Jul	1.75	1.15	21-Jul	0.25	0.10
17-Aug	1.75	1.16	21-Aug	0.25	0.09
17-Sep	1.75	1.15	21-Sep	0.25	0.08
17-Oct	1.75	1.15	21-Oct	0.25	0.08
17-Nov	1.75	1.16	21-Nov	0.25	0.08
17-Dec	2.00	1.30	21-Dec	0.25	0.08
18-Jan	2.00	1.41	22-Jan	0.25	0.08
18-Feb	2.00	1.42	22-Feb	0.25	0.08
18-Mar	2.25	1.51	22-Mar	0.25	0.20
18-Apr	2.25	1.69	22-Apr	0.25	0.33
18-May	2.25	1.70	22-May	0.25	0.77
18-Jun	2.50	1.82	22-Jun	0.25	1.21
18-Jul	2.50	1.91	22-Jul	0.25	1.68
18-Aug	2.50	1.91	22-Aug	0.25	2.33
18-Sep	2.75	1.95	22-Sep	0.25	2.56
18-Oct	2.75	2.19	22-Oct	0.25	3.08
18-Nov	2.75	2.20	22-Nov		
18-Dec	3.00	2.27	22-Dec		
19-Jan	3.00	2.40			
19-Feb	3.00	2.40			
19-Mar	3.00	2.41			
19-Apr	3.00	2.42			
19-May	3.00	2.39			
19-Jun	3.00	2.38			
19-Jul	3.00	2.40			
19-Aug	2.75	2.13			
19-Sep	2.50	2.04			
19-Oct	2.25	1.83			
19-Nov	2.25	1.55			
19-Dec	2.25	1.55			

Source:  
Federal Reserve Discount rate <https://fred.stlouisfed.org/series/INTDSRUSM193N>  
Federal Reserve Funds rate <https://fred.stlouisfed.org/series/DFE>

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Federal Reserve Discount Rates and Federal Funds Rates  
1980 - 2022



**Ameren Missouri**  
**Case No. ER-2022-0337**

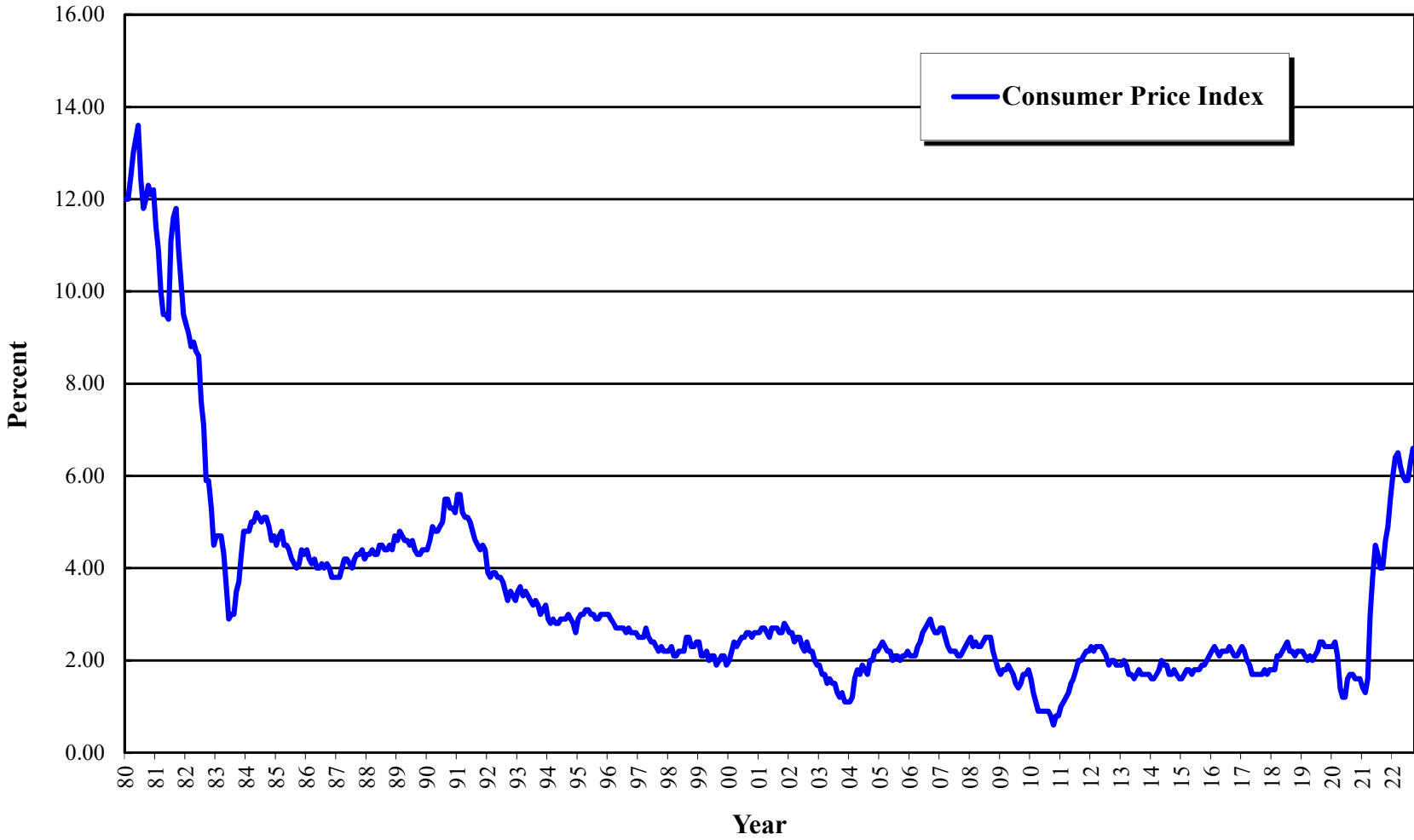
**Rate of Inflation**

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	12.00	Jan 1987	3.80	Jan 1994	2.90	Jan 2001	2.60	Jan 2008	2.50	Jan 2015	1.60	Jan 2022	6.00
Feb	12.00	Feb	3.80	Feb	2.80	Feb	2.70	Feb	2.30	Feb	1.70	Feb	6.40
Mar	12.50	Mar	4.00	Mar	2.90	Mar	2.70	Mar	2.40	Mar	1.80	Mar	6.50
Apr	13.00	Apr	4.20	Apr	2.80	Apr	2.60	Apr	2.30	Apr	1.80	Apr	6.20
May	13.30	May	4.20	May	2.80	May	2.50	May	2.30	May	1.70	May	6.00
Jun	13.60	Jun	4.10	Jun	2.90	Jun	2.70	Jun	2.40	Jun	1.80	Jun	5.90
Jul	12.40	Jul	4.00	Jul	2.90	Jul	2.70	Jul	2.50	Jul	1.80	Jul	5.90
Aug	11.80	Aug	4.20	Aug	2.90	Aug	2.70	Aug	2.50	Aug	1.80	Aug	6.30
Sep	12.00	Sep	4.30	Sep	3.00	Sep	2.60	Sep	2.50	Sep	1.90	Sep	6.60
Oct	12.30	Oct	4.30	Oct	2.90	Oct	2.60	Oct	2.20	Oct	1.90	Oct	6.30
Nov	12.10	Nov	4.40	Nov	2.80	Nov	2.80	Nov	2.00	Nov	2.00	Nov	
Dec	12.20	Dec	4.20	Dec	2.60	Dec	2.70	Dec	1.80	Dec	2.10	Dec	
Jan 1981	11.40	Jan 1988	4.30	Jan 1995	2.90	Jan 2002	2.60	Jan 2009	1.70	Jan 2016	2.20		
Feb	10.90	Feb	4.30	Feb	3.00	Feb	2.60	Feb	1.80	Feb	2.30		
Mar	10.00	Mar	4.40	Mar	3.00	Mar	2.40	Mar	1.80	Mar	2.20		
Apr	9.50	Apr	4.30	Apr	3.10	Apr	2.50	Apr	1.90	Apr	2.10		
May	9.50	May	4.30	May	3.10	May	2.50	May	1.80	May	2.20		
Jun	9.40	Jun	4.50	Jun	3.00	Jun	2.30	Jun	1.70	Jun	2.20		
Jul	11.10	Jul	4.50	Jul	3.00	Jul	2.20	Jul	1.50	Jul	2.20		
Aug	11.60	Aug	4.40	Aug	2.90	Aug	2.40	Aug	1.40	Aug	2.30		
Sep	11.80	Sep	4.40	Sep	2.90	Sep	2.20	Sep	1.50	Sep	2.20		
Oct	10.90	Oct	4.50	Oct	3.00	Oct	2.20	Oct	1.70	Oct	2.10		
Nov	10.20	Nov	4.40	Nov	3.00	Nov	2.00	Nov	1.70	Nov	2.10		
Dec	9.50	Dec	4.70	Dec	3.00	Dec	1.90	Dec	1.80	Dec	2.20		
Jan 1982	9.30	Jan 1989	4.60	Jan 1996	3.00	Jan 2003	1.90	Jan 2010	1.60	Jan 2017	2.30		
Feb	9.10	Feb	4.80	Feb	2.90	Feb	1.70	Feb	1.30	Feb	2.20		
Mar	8.80	Mar	4.70	Mar	2.80	Mar	1.70	Mar	1.10	Mar	2.00		
Apr	8.90	Apr	4.60	Apr	2.70	Apr	1.50	Apr	0.90	Apr	1.90		
May	8.70	May	4.60	May	2.70	May	1.60	May	0.90	May	1.70		
Jun	8.60	Jun	4.50	Jun	2.70	Jun	1.50	Jun	0.90	Jun	1.70		
Jul	7.80	Jul	4.60	Jul	2.70	Jul	1.50	Jul	0.90	Jul	1.70		
Aug	7.10	Aug	4.40	Aug	2.60	Aug	1.30	Aug	0.90	Aug	1.70		
Sep	5.90	Sep	4.30	Sep	2.70	Sep	1.20	Sep	0.80	Sep	1.70		
Oct	5.90	Oct	4.30	Oct	2.60	Oct	1.30	Oct	0.60	Oct	1.80		
Nov	5.30	Nov	4.40	Nov	2.60	Nov	1.10	Nov	0.80	Nov	1.70		
Dec	4.50	Dec	4.40	Dec	2.60	Dec	1.10	Dec	0.80	Dec	1.80		
Jan 1983	4.70	Jan 1990	4.40	Jan 1997	2.50	Jan 2004	1.10	Jan 2011	1.00	Jan 2018	1.80		
Feb	4.70	Feb	4.60	Feb	2.50	Feb	1.20	Feb	1.10	Feb	1.80		
Mar	4.70	Mar	4.90	Mar	2.50	Mar	1.60	Mar	1.20	Mar	2.10		
Apr	4.30	Apr	4.80	Apr	2.70	Apr	1.80	Apr	1.30	Apr	2.10		
May	3.60	May	4.80	May	2.50	May	1.70	May	1.50	May	2.20		
Jun	2.90	Jun	4.90	Jun	2.40	Jun	1.90	Jun	1.60	Jun	2.30		
Jul	3.00	Jul	5.00	Jul	2.40	Jul	1.80	Jul	1.80	Jul	2.40		
Aug	3.00	Aug	5.50	Aug	2.30	Aug	1.70	Aug	2.00	Aug	2.20		
Sep	3.50	Sep	5.50	Sep	2.20	Sep	2.00	Sep	2.00	Sep	2.20		
Oct	3.70	Oct	5.30	Oct	2.30	Oct	2.00	Oct	2.10	Oct	2.10		
Nov	4.30	Nov	5.30	Nov	2.20	Nov	2.20	Nov	2.20	Nov	2.20		
Dec	4.80	Dec	5.20	Dec	2.20	Dec	2.20	Dec	2.20	Dec	2.20		
Jan 1984	4.80	Jan 1991	5.60	Jan 1998	2.20	Jan 2005	2.30	Jan 2012	2.30	Jan 2019	2.20		
Feb	4.80	Feb	5.60	Feb	2.30	Feb	2.40	Feb	2.20	Feb	2.10		
Mar	5.00	Mar	5.20	Mar	2.10	Mar	2.30	Mar	2.30	Mar	2.00		
Apr	5.00	Apr	5.10	Apr	2.10	Apr	2.20	Apr	2.30	Apr	2.10		
May	5.20	May	5.10	May	2.20	May	2.20	May	2.30	May	2.00		
Jun	5.10	Jun	5.00	Jun	2.20	Jun	2.00	Jun	2.20	Jun	2.10		
Jul	5.00	Jul	4.80	Jul	2.20	Jul	2.10	Jul	2.10	Jul	2.20		
Aug	5.10	Aug	4.60	Aug	2.50	Aug	2.10	Aug	1.90	Aug	2.40		
Sep	5.10	Sep	4.50	Sep	2.50	Sep	2.00	Sep	2.00	Sep	2.40		
Oct	4.90	Oct	4.40	Oct	2.30	Oct	2.10	Oct	2.00	Oct	2.30		
Nov	4.60	Nov	4.50	Nov	2.30	Nov	2.10	Nov	1.90	Nov	2.30		
Dec	4.70	Dec	4.40	Dec	2.40	Dec	2.20	Dec	1.90	Dec	2.30		
Jan 1985	4.50	Jan 1992	3.90	Jan 1999	2.40	Jan 2006	2.10	Jan 2013	1.90	Jan 2020	2.30		
Feb	4.70	Feb	3.80	Feb	2.10	Feb	2.10	Feb	2.00	Feb	2.40		
Mar	4.80	Mar	3.90	Mar	2.10	Mar	2.10	Mar	1.90	Mar	2.10		
Apr	4.50	Apr	3.90	Apr	2.20	Apr	2.30	Apr	1.70	Apr	1.40		
May	4.50	May	3.80	May	2.00	May	2.40	May	1.70	May	1.20		
Jun	4.40	Jun	3.80	Jun	2.10	Jun	2.60	Jun	1.60	Jun	1.20		
Jul	4.20	Jul	3.70	Jul	2.10	Jul	2.70	Jul	1.70	Jul	1.60		
Aug	4.10	Aug	3.50	Aug	1.90	Aug	2.80	Aug	1.80	Aug	1.70		
Sep	4.00	Sep	3.30	Sep	2.00	Sep	2.90	Sept	1.70	Sep	1.70		
Oct	4.10	Oct	3.50	Oct	2.10	Oct	2.70	Oct	1.70	Oct	1.60		
Nov	4.40	Nov	3.40	Nov	2.10	Nov	2.60	Nov	1.70	Nov	1.60		
Dec	4.30	Dec	3.30	Dec	1.90	Dec	2.60	Dec	1.70	Dec	1.60		
Jan 1986	4.40	Jan 1993	3.50	Jan 2000	2.00	Jan 2007	2.70	Jan 2014	1.60	Jan 2021	1.40		
Feb	4.20	Feb	3.60	Feb	2.20	Feb	2.70	Feb	1.60	Feb	1.30		
Mar	4.10	Mar	3.40	Mar	2.40	Mar	2.50	Mar	1.70	Mar	1.60		
Apr	4.20	Apr	3.50	Apr	2.30	Apr	2.30	Apr	1.80	Apr	3.00		
May	4.00	May	3.40	May	2.40	May	2.20	May	2.00	May	3.80		
Jun	4.00	Jun	3.30	Jun	2.50	Jun	2.20	Jun	1.90	Jun	4.50		
Jul	4.10	Jul	3.20	Jul	2.50	Jul	2.20	Jul	1.90	Jul	4.30		
Aug	4.00	Aug	3.30	Aug	2.60	Aug	2.10	Aug	1.70	Aug	4.00		
Sep	4.10	Sep	3.20	Sep	2.60	Sep	2.10	Sep	1.70	Sep	4.00		
Oct	4.00	Oct	3.00	Oct	2.50	Oct	2.20	Oct	1.80	Oct	4.60		
Nov	3.80	Nov	3.10	Nov	2.60	Nov	2.30	Nov	1.70	Nov	4.90		
Dec	3.80	Dec	3.20	Dec	2.60	Dec	2.40	Dec	1.60	Dec	5.50		

Source: U.S. Dept. of Labor, Bureau of Labor Statistics, Consumer Price Index - All Urban Consumers less food and energy, Change for 12-Month Period, Bureau of Labor Statistics, <https://www.bls.gov/cpi/data.htm>

Ameren Missouri  
Case No. ER-2022-0337

Rate of Inflation  
1980 - 2022



**Ameren Missouri**  
**Case No. ER-2022-0337**

**Average Yields on Moody's Public Utility Bonds**

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	12.12	Jan 1987	8.77	Jan 1994	7.31	Jan 2001	7.76	Jan 2008	6.08	Jan 2015	3.83	Jan 2022	3.25
Feb	13.48	Feb	8.81	Feb	7.44	Feb	7.69	Feb	6.28	Feb	3.91	Feb	3.48
Mar	14.33	Mar	8.75	Mar	7.83	Mar	7.59	Mar	6.29	Mar	3.97	Mar	4.02
Apr	13.50	Apr	9.30	Apr	8.20	Apr	7.81	Apr	6.36	Apr	3.96	Apr	4.34
May	12.17	May	9.82	May	8.32	May	7.88	May	6.38	May	4.38	May	4.79
Jun	11.87	Jun	9.87	Jun	8.31	Jun	7.75	Jun	6.50	Jun	4.60	Jun	4.91
Jul	12.12	Jul	10.01	Jul	8.47	Jul	7.71	Jul	6.50	Jul	4.63	Jul	4.84
Aug	12.82	Aug	10.33	Aug	8.41	Aug	7.57	Aug	6.48	Aug	4.54	Aug	4.80
Sep	13.29	Sep	11.00	Sep	8.65	Sep	7.73	Sep	6.59	Sep	4.68	Sep	5.33
Oct	13.53	Oct	11.32	Oct	8.88	Oct	7.64	Oct	7.70	Oct	4.63	Oct	5.91
Nov	14.07	Nov	10.82	Nov	9.00	Nov	7.61	Nov	7.80	Nov	4.73	Nov	
Dec	14.48	Dec	10.99	Dec	8.79	Dec	7.86	Dec	6.87	Dec	4.69	Dec	
Jan 1981	14.22	Jan 1988	10.75	Jan 1995	8.77	Jan 2002	7.69	Jan 2009	6.77	Jan 2016	4.62		
Feb	14.84	Feb	10.11	Feb	8.56	Feb	7.62	Feb	6.72	Feb	4.44		
Mar	14.86	Mar	10.11	Mar	8.41	Mar	7.83	Mar	6.85	Mar	4.40		
Apr	15.32	Apr	10.53	Apr	8.30	Apr	7.74	Apr	6.90	Apr	4.16		
May	15.84	May	10.75	May	7.93	May	7.76	May	6.83	May	4.06		
Jun	15.27	Jun	10.71	Jun	7.62	Jun	7.67	Jun	6.54	Jun	3.93		
Jul	15.87	Jul	10.96	Jul	7.73	Jul	7.54	Jul	6.15	Jul	3.70		
Aug	16.33	Aug	11.09	Aug	7.86	Aug	7.34	Aug	5.80	Aug	3.73		
Sep	16.89	Sep	10.56	Sep	7.62	Sep	7.23	Sep	5.60	Sep	3.80		
Oct	16.76	Oct	9.92	Oct	7.46	Oct	7.43	Oct	5.64	Oct	3.90		
Nov	15.50	Nov	9.89	Nov	7.40	Nov	7.31	Nov	5.71	Nov	4.21		
Dec	15.77	Dec	10.02	Dec	7.21	Dec	7.20	Dec	5.86	Dec	4.39		
Jan 1982	16.73	Jan 1989	10.02	Jan 1996	7.20	Jan 2003	7.13	Jan 2010	5.83	Jan 2017	4.24		
Feb	16.72	Feb	10.02	Feb	7.37	Feb	6.92	Feb	5.94	Feb	4.25		
Mar	16.07	Mar	10.16	Mar	7.72	Mar	6.80	Mar	5.90	Mar	4.30		
Apr	15.82	Apr	10.14	Apr	7.88	Apr	6.68	April	5.87	Apr	4.19		
May	15.60	May	9.92	May	7.99	May	6.35	May	5.59	May	4.19		
Jun	16.18	Jun	9.49	Jun	8.07	Jun	6.21	Jun	5.62	Jun	4.01		
Jul	16.04	Jul	9.34	Jul	8.02	Jul	6.54	Jul	5.41	July	4.06		
Aug	15.22	Aug	9.37	Aug	7.84	Aug	6.78	Aug	5.10	Aug	3.92		
Sep	14.56	Sep	9.43	Sep	8.01	Sep	6.58	Sep	5.10	Sep	3.93		
Oct	13.88	Oct	9.37	Oct	7.76	Oct	6.50	Oct	5.20	Oct	3.97		
Nov	13.58	Nov	9.33	Nov	7.48	Nov	6.44	Nov	5.45	Nov	3.88		
Dec	13.55	Dec	9.31	Dec	7.58	Dec	6.35	Dec	5.64	Dec	3.85		
Jan 1983	13.46	Jan 1990	9.44	Jan 1997	7.79	Jan 2004	6.23	Jan 2011	5.64	Jan 2018	3.91		
Feb	13.60	Feb	9.66	Feb	7.68	Feb	6.17	Feb	5.73	Feb	4.15		
Mar	13.28	Mar	9.75	Mar	7.92	Mar	6.01	Mar	5.62	Mar	4.21		
Apr	13.03	Apr	9.87	Apr	8.08	Apr	6.38	Apr	5.62	Apr	4.24		
May	13.00	May	9.89	May	7.94	May	6.68	May	5.38	May	4.36		
Jun	13.17	Jun	9.69	Jun	7.77	Jun	6.53	Jun	5.32	Jun	4.37		
Jul	13.28	Jul	9.66	Jul	7.52	Jul	6.34	Jul	5.34	Jul	4.35		
Aug	13.50	Aug	9.84	Aug	7.57	Aug	6.18	Aug	4.78	Aug	4.33		
Sep	13.35	Sep	10.01	Sep	7.50	Sep	6.01	Sep	4.61	Sep	4.41		
Oct	13.19	Oct	9.94	Oct	7.37	Oct	5.95	Oct	4.66	Oct	4.56		
Nov	13.33	Nov	9.76	Nov	7.24	Nov	5.97	Nov	4.37	Nov	4.65		
Dec	13.48	Dec	9.57	Dec	7.16	Dec	5.93	Dec	4.47	Dec	4.51		
Jan 1984	13.40	Jan 1991	9.56	Jan 1998	7.03	Jan 2005	5.80	Jan 2012	4.48	Jan 2019	4.48		
Feb	13.50	Feb	9.31	Feb	7.09	Feb	5.64	Feb	4.47	Feb	4.35		
Mar	14.03	Mar	9.39	Mar	7.13	Mar	5.86	Mar	4.59	Mar	4.26		
Apr	14.30	Apr	9.30	Apr	7.12	Apr	5.72	Apr	4.54	Apr	4.18		
May	14.95	May	9.29	May	7.11	May	5.60	May	4.36	May	4.10		
Jun	15.16	Jun	9.44	Jun	6.99	Jun	5.39	Jun	4.26	Jun	3.93		
Jul	14.92	Jul	9.40	Jul	6.99	Jul	5.50	Jul	4.12	Jul	3.79		
Aug	14.29	Aug	9.16	Aug	6.96	Aug	5.51	Aug	4.18	Aug	3.36		
Sep	14.04	Sep	9.03	Sep	6.88	Sep	5.54	Sep	4.17	Sept	3.44		
Oct	13.68	Oct	8.99	Oct	6.88	Oct	5.79	Oct	4.04	Oct	3.45		
Nov	13.15	Nov	8.93	Nov	6.96	Nov	5.88	Nov	3.95	Nov	3.48		
Dec	12.96	Dec	8.76	Dec	6.84	Dec	5.83	Dec	4.10	Dec	3.45		
Jan 1985	12.88	Jan 1992	8.67	Jan 1999	6.87	Jan 2006	5.77	Jan 2013	4.24	Jan 2020	3.34		
Feb	13.00	Feb	8.77	Feb	7.00	Feb	5.83	Feb	4.29	Feb	3.16		
Mar	13.66	Mar	8.84	Mar	7.18	Mar	5.98	Mar	4.29	Mar	3.59		
Apr	13.42	Apr	8.79	Apr	7.16	Apr	6.28	Apr	4.08	Apr	3.31		
May	12.89	May	8.72	May	7.42	May	6.39	May	4.24	May	3.22		
Jun	11.91	Jun	8.64	Jun	7.70	June	6.39	Jun	4.63	Jun	3.10		
Jul	11.88	Jul	8.46	Jul	7.66	July	6.37	Jul	4.78	Jul	2.77		
Aug	11.93	Aug	8.34	Aug	7.86	Aug	6.20	Aug	4.85	Aug	2.76		
Sep	11.95	Sep	8.32	Sep	7.87	Sep	6.03	Sept	4.90	Sep	2.88		
Oct	11.84	Oct	8.44	Oct	8.02	Oct	6.01	Oct	4.78	Oct	2.98		
Nov	11.33	Nov	8.53	Nov	7.86	Nov	5.82	Nov	4.86	Nov	2.89		
Dec	10.82	Dec	8.36	Dec	8.04	Dec	5.83	Dec	4.88	Dec	2.80		
Jan 1986	10.66	Jan 1993	8.23	Jan 2000	8.22	Jan 2007	5.96	Jan 2014	4.72	Jan 2021	2.94		
Feb	10.16	Feb	8.00	Feb	8.10	Feb	5.91	Feb	4.64	Feb	3.13		
Mar	9.33	Mar	7.85	Mar	8.14	Mar	5.87	Mar	4.64	Mar	3.48		
Apr	9.02	Apr	7.76	Apr	8.14	Apr	6.01	Apr	4.52	Apr	3.33		
May	9.52	May	7.78	May	8.56	May	6.03	May	4.37	May	3.36		
Jun	9.51	Jun	7.68	Jun	8.22	Jun	6.34	Jun	4.42	Jun	3.19		
Jul	9.19	Jul	7.53	Jul	8.17	Jul	6.28	Jul	4.35	Jul	2.99		
Aug	9.15	Aug	7.21	Aug	8.06	Aug	6.28	Aug	4.28	Aug	2.99		
Sep	9.42	Sep	7.01	Sep	8.15	Sep	6.24	Sep	4.40	Sep	3.00		
Oct	9.39	Oct	6.99	Oct	8.08	Oct	6.17	Oct	4.24	Oct	3.13		
Nov	9.15	Nov	7.30	Nov	8.03	Nov	6.04	Nov	4.29	Nov	3.06		
Dec	8.96	Dec	7.33	Dec	7.79	Dec	6.23	Dec	4.18	Dec	3.17		

Source: [Mergent Bond Record](#)

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Average Yields on Thirty-Year U.S. Treasury Bonds**

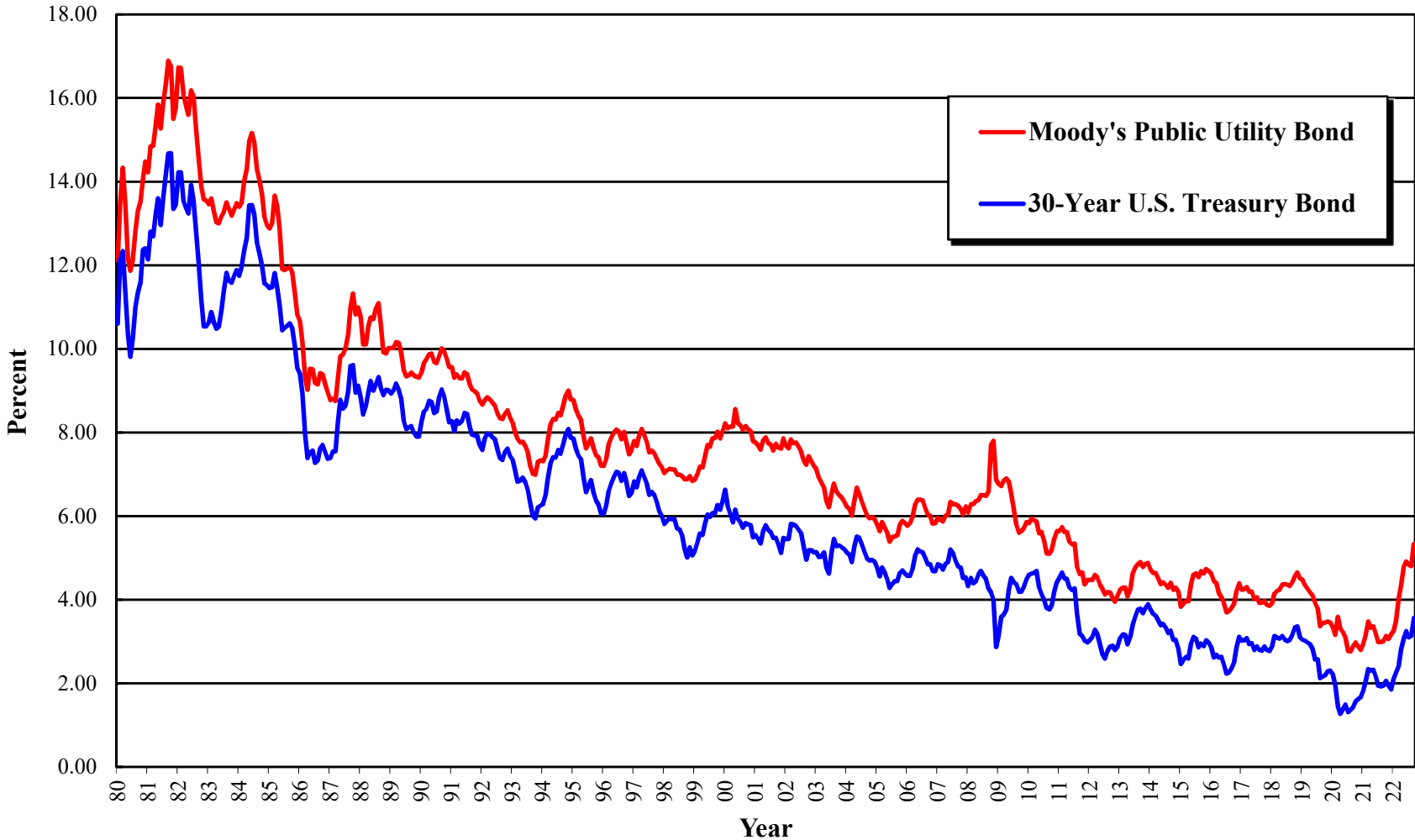
Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	10.60	Jan 1987	7.39	Jan 1994	6.29	Jan 2001	5.54	Jan 2008	4.33	Jan 2015	2.46	Jan 2022	2.10
Feb	12.13	Feb	7.54	Feb	6.49	Feb	5.45	Feb	4.52	Feb	2.57	Feb	2.25
Mar	12.34	Mar	7.55	Mar	6.91	Mar	5.34	Mar	4.39	Mar	2.63	Mar	2.41
Apr	11.40	Apr	8.25	Apr	7.27	Apr	5.65	Apr	4.44	Apr	2.59	Apr	2.81
May	10.36	May	8.78	May	7.41	May	5.78	May	4.60	May	2.96	May	3.07
Jun	9.81	Jun	8.57	Jun	7.40	Jun	5.67	Jun	4.69	Jun	3.11	Jun	3.25
Jul	10.24	Jul	8.64	Jul	7.58	Jul	5.61	Jul	4.57	Jul	3.07	Jul	3.10
Aug	11.00	Aug	8.97	Aug	7.49	Aug	5.48	Aug	4.50	Aug	2.86	Aug	3.13
Sep	11.34	Sep	9.59	Sep	7.71	Sep	5.48	Sep	4.27	Sep	2.95	Sep	3.56
Oct	11.59	Oct	9.61	Oct	7.94	Oct	5.32	Oct	4.17	Oct	2.89	Oct	4.04
Nov	12.37	Nov	8.95	Nov	8.08	Nov	5.12	Nov	4.00	Nov	3.03	Nov	
Dec	12.40	Dec	9.12	Dec	7.87	Dec	5.48	Dec	2.87	Dec	2.97	Dec	
Jan 1981	12.14	Jan 1988	8.83	Jan 1995	7.85	Jan 2002	5.45	Jan 2009	3.13	Jan 2016	2.86		
Feb	12.80	Feb	8.43	Feb	7.61	Feb	5.45	Feb	3.59	Feb	2.62		
Mar	12.69	Mar	8.63	Mar	7.45	Mar	5.81	Mar	3.64	Mar	2.68		
Apr	13.20	Apr	8.95	Apr	7.36	Apr	5.79	Apr	3.76	Apr	2.62		
May	13.60	May	9.23	May	6.95	May	5.76	May	4.23	May	2.63		
Jun	12.96	Jun	9.00	Jun	6.57	Jun	5.68	Jun	4.52	Jun	2.45		
Jul	13.59	Jul	9.14	Jul	6.72	Jul	5.59	Jul	4.41	Jul	2.23		
Aug	14.17	Aug	9.32	Aug	6.86	Aug	5.28	Aug	4.37	Aug	2.26		
Sep	14.67	Sep	9.06	Sep	6.55	Sep	4.96	Sep	4.19	Sep	2.35		
Oct	14.68	Oct	8.89	Oct	6.37	Oct	5.18	Oct	4.19	Oct	2.50		
Nov	13.35	Nov	9.02	Nov	6.26	Nov	5.18	Nov	4.31	Nov	2.86		
Dec	13.45	Dec	9.01	Dec	6.06	Dec	5.13	Dec	4.49	Dec	3.11		
Jan 1982	14.22	Jan 1989	8.93	Jan 1996	6.05	Jan 2003	5.14	Jan 2010	4.60	Jan 2017	3.02		
Feb	14.22	Feb	9.01	Feb	6.24	Feb	5.02	Feb	4.62	Feb	3.03		
Mar	13.53	Mar	9.17	Mar	6.60	Mar	5.03	Mar	4.64	Mar	3.08		
Apr	13.37	Apr	9.03	Apr	6.79	Apr	5.13	Apr	4.69	Apr	2.94		
May	13.24	May	8.83	May	6.93	May	4.76	May	4.29	May	2.96		
Jun	13.92	Jun	8.27	Jun	7.06	Jun	4.62	Jun	4.13	Jun	2.80		
Jul	13.55	Jul	8.08	Jul	7.03	Jul	5.13	Jul	3.99	Jul	2.88		
Aug	12.77	Aug	8.12	Aug	6.84	Aug	5.45	Aug	3.80	Aug	2.80		
Sep	12.07	Sep	8.15	Sep	7.03	Sep	5.28	Sep	3.77	Sep	2.78		
Oct	11.17	Oct	8.00	Oct	6.81	Oct	5.30	Oct	3.87	Oct	2.88		
Nov	10.54	Nov	7.90	Nov	6.48	Nov	5.25	Nov	4.19	Nov	2.80		
Dec	10.54	Dec	7.90	Dec	6.55	Dec	5.21	Dec	4.42	Dec	2.77		
Jan 1983	10.63	Jan 1990	8.26	Jan 1997	6.83	Jan 2004	5.13	Jan 2011	4.52	Jan 2018	2.88		
Feb	10.88	Feb	8.50	Feb	6.69	Feb	5.08	Feb	4.65	Feb	3.13		
Mar	10.63	Mar	8.56	Mar	6.93	Mar	4.90	Mar	4.51	Mar	3.09		
Apr	10.48	Apr	8.76	Apr	7.09	Apr	5.28	Apr	4.50	Apr	3.07		
May	10.53	May	8.73	May	6.94	May	5.51	May	4.29	May	3.13		
Jun	10.93	Jun	8.46	Jun	6.77	Jun	5.48	Jun	4.23	Jun	3.05		
Jul	11.40	Jul	8.50	Jul	6.51	Jul	5.31	Jul	4.27	Jul	3.01		
Aug	11.82	Aug	8.86	Aug	6.58	Aug	5.15	Aug	3.65	Aug	3.04		
Sep	11.63	Sep	9.03	Sep	6.50	Sep	4.98	Sep	3.18	Sep	3.15		
Oct	11.58	Oct	8.86	Oct	6.33	Oct	4.94	Oct	3.13	Oct	3.34		
Nov	11.75	Nov	8.54	Nov	6.11	Nov	4.95	Nov	3.02	Nov	3.36		
Dec	11.88	Dec	8.24	Dec	5.99	Dec	4.91	Dec	2.98	Dec	3.10		
Jan 1984	11.75	Jan 1991	8.27	Jan 1998	5.81	Jan 2005	4.77	Jan 2012	3.03	Jan 2019	3.04		
Feb	11.95	Feb	8.03	Feb	5.89	Feb	4.56	Feb	3.11	Feb	3.02		
Mar	12.38	Mar	8.29	Mar	5.95	Mar	4.77	Mar	3.28	Mar	2.98		
Apr	12.65	Apr	8.21	Apr	5.92	Apr	4.65	Apr	3.18	Apr	2.94		
May	13.43	May	8.27	May	5.93	May	4.49	May	2.93	May	2.82		
Jun	13.44	Jun	8.47	Jun	5.70	Jun	4.28	Jun	2.70	Jun	2.57		
Jul	13.21	Jul	8.45	Jul	5.68	Jul	4.38	Jul	2.59	Jul	2.57		
Aug	12.54	Aug	8.14	Aug	5.54	Aug	4.44	Aug	2.77	Aug	2.12		
Sep	12.29	Sep	7.95	Sep	5.20	Sep	4.45	Sep	2.88	Sept	2.16		
Oct	11.98	Oct	7.93	Oct	5.01	Oct	4.64	Oct	2.90	Oct	2.19		
Nov	11.56	Nov	7.92	Nov	5.25	Nov	4.70	Nov	2.80	Nov	2.28		
Dec	11.52	Dec	7.70	Dec	5.06	Dec	4.62	Dec	2.88	Dec	2.30		
Jan 1985	11.45	Jan 1992	7.58	Jan 1999	5.16	Jan 2006	4.57	Jan 2013	3.08	Jan 2020	2.22		
Feb	11.47	Feb	7.85	Feb	5.37	Feb	4.57	Feb	3.17	Feb	1.97		
Mar	11.81	Mar	7.97	Mar	5.58	Mar	4.73	Mar	3.16	Mar	1.46		
Apr	11.47	Apr	7.96	Apr	5.55	Apr	5.06	Apr	2.93	Apr	1.27		
May	11.05	May	7.89	May	5.81	May	5.20	May	3.11	May	1.38		
Jun	10.45	Jun	7.84	Jun	6.04	June	5.15	Jun	3.40	Jun	1.49		
Jul	10.50	Jul	7.60	Jul	5.98	July	5.13	Jul	3.61	Jul	1.31		
Aug	10.56	Aug	7.39	Aug	6.07	Aug	5.00	Aug	3.76	Aug	1.36		
Sep	10.61	Sep	7.34	Sep	6.07	Sep	4.85	Sept	3.79	Sep	1.42		
Oct	10.50	Oct	7.53	Oct	6.26	Oct	4.85	Oct	3.68	Oct	1.57		
Nov	10.06	Nov	7.61	Nov	6.15	Nov	4.69	Nov	3.80	Nov	1.62		
Dec	9.54	Dec	7.44	Dec	6.35	Dec	4.68	Dec	3.89	Dec	1.67		
Jan 1986	9.40	Jan 1993	7.34	Jan 2000	6.63	Jan 2007	4.85	Jan 2014	3.77	Jan 2021	1.82		
Feb	8.93	Feb	7.09	Feb	6.23	Feb	4.82	Feb	3.66	Feb	2.04		
Mar	7.96	Mar	6.82	Mar	6.05	Mar	4.72	Mar	3.62	Mar	2.34		
Apr	7.39	Apr	6.85	Apr	5.85	Apr	4.87	Apr	3.52	Apr	2.30		
May	7.52	May	6.92	May	6.15	May	4.90	May	3.39	May	2.32		
Jun	7.57	Jun	6.81	Jun	5.93	Jun	5.20	Jun	3.42	Jun	2.16		
Jul	7.27	Jul	6.63	Jul	5.85	Jul	5.11	Jul	3.33	Jul	1.94		
Aug	7.33	Aug	6.32	Aug	5.72	Aug	4.93	Aug	3.20	Aug	1.92		
Sep	7.62	Sep	6.00	Sep	5.83	Sep	4.79	Sep	3.26	Sep	1.94		
Oct	7.70	Oct	5.94	Oct	5.80	Oct	4.77	Oct	3.04	Oct	2.06		
Nov	7.52	Nov	6.21	Nov	5.78	Nov	4.52	Nov	3.04	Nov	1.94		
Dec	7.37	Dec	6.25	Dec	5.49	Dec	4.53	Dec	2.83	Dec	1.85		

Source:

<http://research.stlouisfed.org/fred2/data/GS30.txt>

Ameren Missouri  
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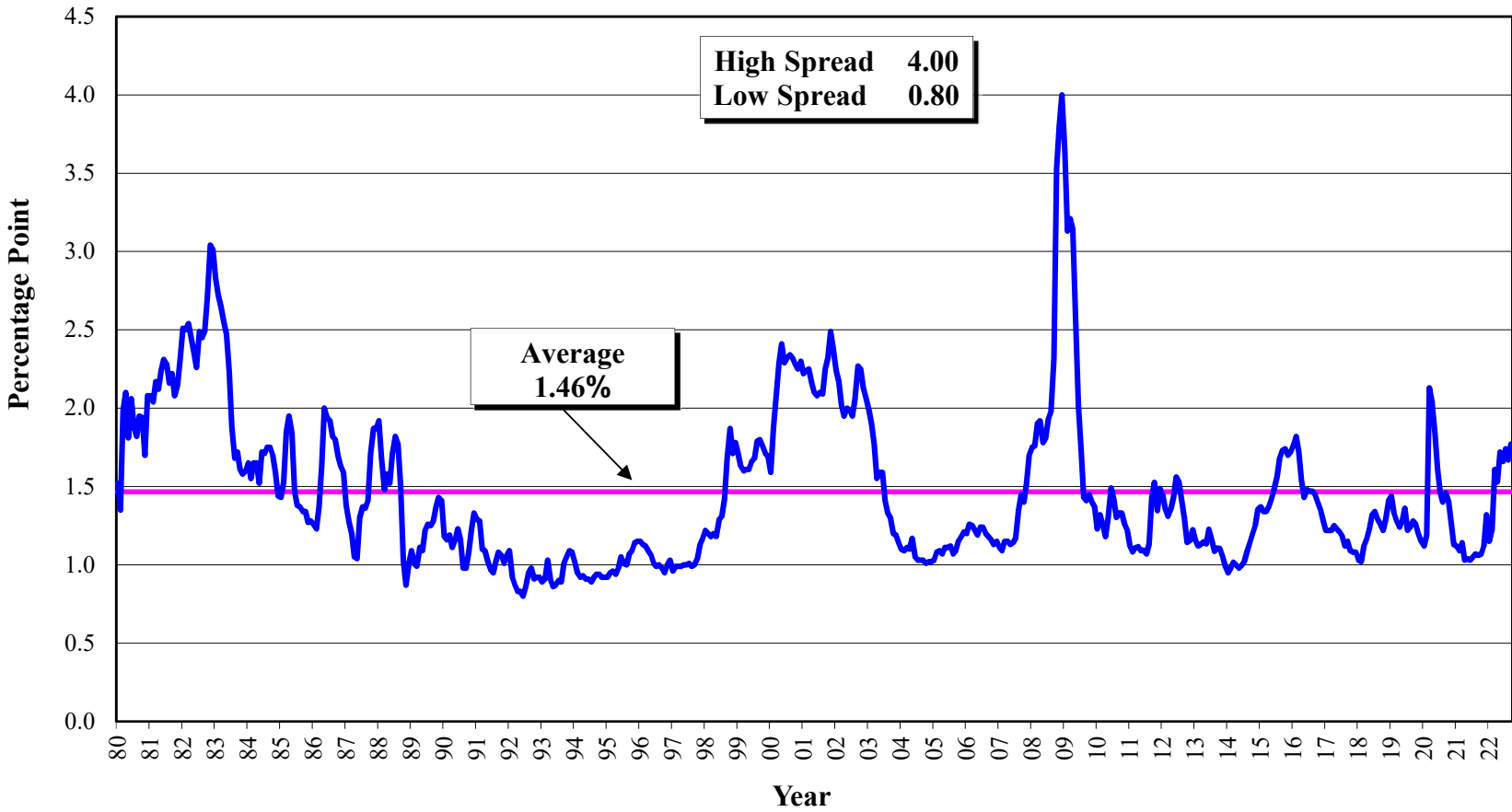
Average Yields on Mergent's Public Utility Bonds and  
Thirty-Year U.S. Treasury Bonds (1980 - 2022)





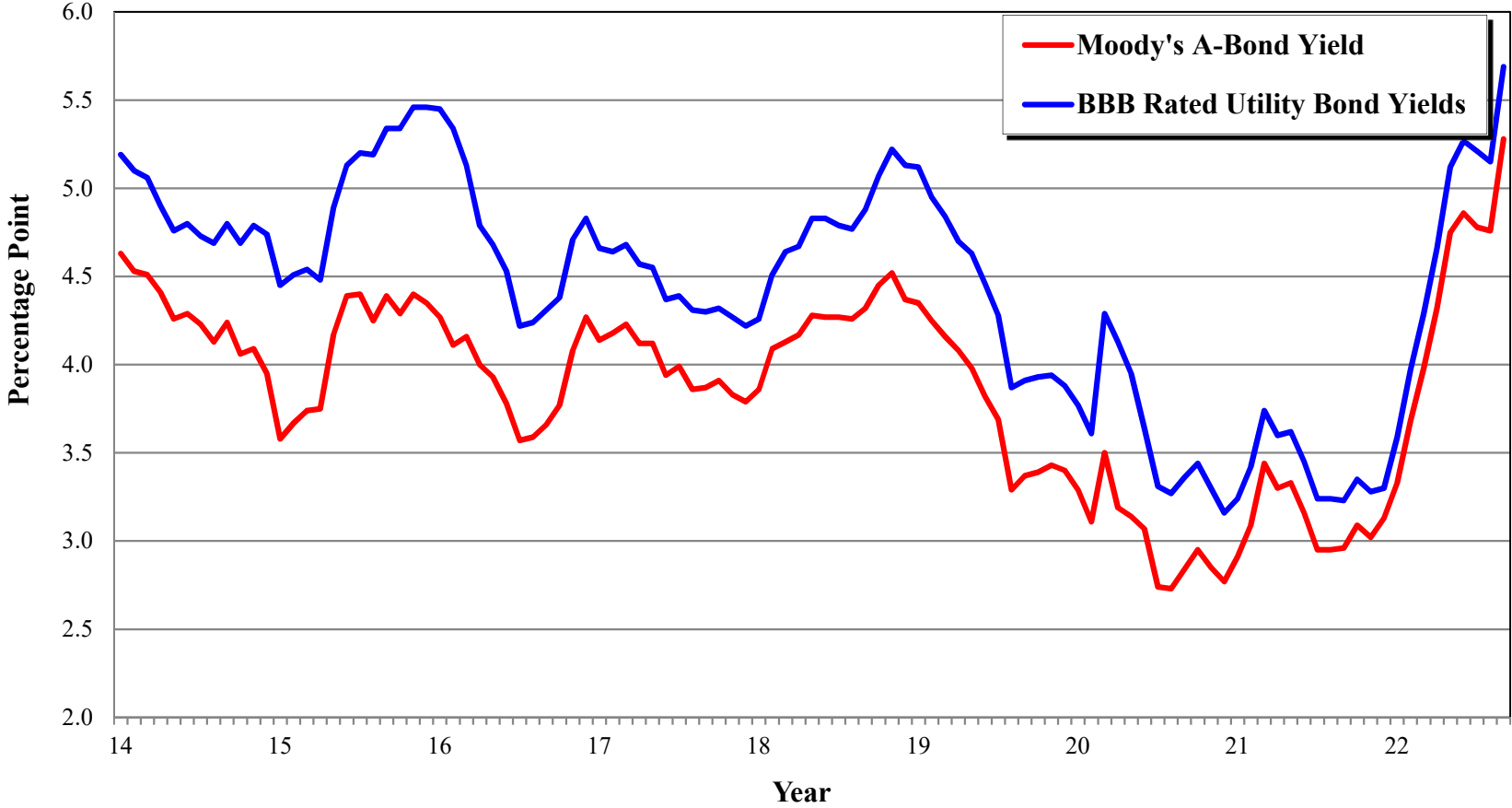
Ameren Missouri  
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Monthly Spreads Between Yields on Moody's Public Utility Bonds and  
30-Year U.S. Treasury Bonds (1980 - 2022)



Ameren Missouri  
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**Average Yields on A and BBB rated Utility Bonds  
(2014- 2022)**



**Ameren Missouri**  
Case No. ER-2022-0337

**Historical Consolidated Capital Structures for  
Ameren Corporation**  
(Dollars in Millions)

Capital Components	March 31, 2020	June 30, 2020	September 30, 2020	December 31, 2020
Common Equity	\$8,085.2	\$8,226.9	\$8,489.6	\$8,937.7
Preferred Stock	\$142.5	\$142.5	\$142.5	\$142.5
Long-Term Debt	\$9,472.0	\$10,265.7	\$10,266.7	\$10,830.6
	<u>\$17,699.6</u>	<u>\$18,635.1</u>	<u>\$18,898.8</u>	<u>\$19,910.7</u>

Capital Components	March 31, 2021	June 30, 2021	September 30, 2021	December 31, 2021
Common Equity	\$9,148.0	\$9,353.3	\$9,685.2	\$9,699.2
Preferred Stock	\$129.6	\$129.6	\$129.6	\$129.6
Long-Term Debt	\$11,278.7	\$12,244.6	\$12,245.7	\$12,818.7
	<u>\$20,556.3</u>	<u>\$21,727.6</u>	<u>\$22,060.6</u>	<u>\$22,647.6</u>

Capital Components	March 31, 2022	June 30, 2022	September 30, 2022	December 31, 2022
Common Equity	\$9,804.7	\$9,879.0	\$10,200.0	
Preferred Stock	\$129.6	\$129.6	\$129.6	
Long-Term Debt	\$12,820.4	\$13,341.7	\$13,484.1	
	<u>\$22,754.7</u>	<u>\$23,350.4</u>	<u>\$23,813.7</u>	

**Historical Consolidated Capital Structures for  
Ameren Missouri**  
(Dollars in Millions)

Capital Components	March 31, 2020	June 30, 2020	September 30, 2020	December 31, 2020
Common Equity	\$4,258.6	\$4,410.7	\$4,708.2	\$5,129.7
Preferred Stock	\$80.8	\$80.8	\$80.8	\$80.8
Long-Term Debt	\$4,249.8	\$4,250.9	\$4,251.9	\$4,795.5
Total	<u>\$8,589.1</u>	<u>\$8,742.4</u>	<u>\$9,040.8</u>	<u>\$10,005.9</u>

Capital Components	March 31, 2021	June 30, 2021	September 30, 2021	December 31, 2021
Common Equity	\$5,289.39	\$5,470.4	\$5,845.4	\$5,830.6
Preferred Stock	\$80.76	\$80.8	\$80.8	\$80.8
Long-Term Debt	\$4,796.66	\$5,318.7	\$5,319.9	\$5,321.4
Total	<u>\$10,166.8</u>	<u>\$10,869.8</u>	<u>\$11,246.0</u>	<u>\$11,232.7</u>

Capital Components	March 31, 2022	June 30, 2022	September 30, 2022	December 31, 2022
Common Equity	\$5,880.1	\$5,980.9	\$6,378.0	
Preferred Stock	\$80.8	\$80.8	\$80.8	
Long-Term Debt	\$5,322.5	\$5,842.7	\$5,844.4	
	<u>\$11,283.4</u>	<u>\$11,904.4</u>	<u>\$12,303.1</u>	

Sources:  
Form 10-Q, 10-K.  
Staff Data Request No. 0191

**Ameren Missouri**  
Case No. ER-2022-0337

**Historical Consolidated Capital Structures for  
Ameren Corporation**  
(Percentage)

Capital Components	March 31, 2020	June 30, 2020	September 30, 2020	December 31, 2020
Common Equity	45.68%	44.15%	44.92%	44.89%
Preferred Stock	0.80%	0.76%	0.75%	0.72%
Long-Term Debt	53.52%	55.09%	54.32%	54.40%
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

Capital Components	March 31, 2021	June 30, 2021	September 30, 2021	December 31, 2021
Common Equity	44.50%	43.05%	43.90%	42.83%
Preferred Stock	0.63%	0.60%	0.59%	0.57%
Long-Term Debt	54.87%	56.36%	55.51%	56.60%
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

Capital Components	March 31, 2022	June 30, 2022	September 30, 2022	December 31, 2022
Common Equity	43.09%	42.31%	42.83%	
Preferred Stock	0.57%	0.56%	0.54%	
Long-Term Debt	56.34%	57.14%	56.62%	
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>          </u>

**Historical Consolidated Capital Structures for  
Ameren Missouri**  
(Percentage)

Capital Components	March 31, 2020	June 30, 2020	September 30, 2020	December 31, 2020
Common Equity	49.58%	50.45%	52.08%	51.27%
Preferred Stock	0.94%	0.92%	0.89%	0.81%
Long-Term Debt	49.48%	48.62%	47.03%	47.93%
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

Capital Components	March 31, 2021	June 30, 2021	September 30, 2021	December 31, 2021
Common Equity	52.03%	50.33%	51.98%	51.91%
Preferred Stock	0.79%	0.74%	0.72%	0.72%
Long-Term Debt	47.18%	48.93%	47.30%	47.37%
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

Capital Components	March 31, 2022	June 30, 2022	September 30, 2022	December 31, 2022
Common Equity	52.11%	50.24%	51.84%	
Preferred Stock	0.72%	0.68%	0.66%	
Long-Term Debt	47.17%	49.08%	47.50%	
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>          </u>

Sources:  
Form 10-Q, 10-K.  
Staff Data Request No. 0191

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Capital Structure as of September 30, 2022**

**Ameren Corporation**

*(Dollars in Millions)*

Capital Component	Amount	Percentage of Capital
Common Stock Equity	\$10,200	42.83%
Preferred Stock	\$130	0.54%
Long-Term Debt	\$13,484	56.62%
<b>Total Capitalization</b>	<b><u>\$23,814</u></b>	<b><u>100.00%</u></b>

Sources:

Staff Data Request No. 0191

**Adjusted Capital Structure as of September 30, 2022**

**Ameren Missouri**

*(Dollars in Millions)*

Capital Component	Amount	Percentage of Capital
Common Stock Equity	\$6,378	51.84%
Preferred Stock	\$81	0.66%
Long-Term Debt	\$5,844	47.50%
<b>Total Capitalization</b>	<b><u>\$12,303</u></b>	<b><u>100.00%</u></b>

Source:

Staff Data Request No. 0191

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Embedded Cost of Long-Term Debt as of September 30, 2022**  
**for Ameren Corporation & Ameren Missouri**

**Ameren Corporation**

(In millions)

---

Total Annual Cost: \$500.0

Total Carrying Value: \$13,482.9

---

Embedded Cost = Total Annual Cost/Total Carrying Value 3.71%

Note:

Source:

Staff Data Request No. 0187

**Ameren Missouri**

(In millions)

---

Total Annual Cost: \$228.5

Total Carrying Value: \$5,844.5

---

Embedded Cost = Total Annual Cost/Total Carrying Value 3.91%

Note:

Source:

Staff Data Request No. 0187

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Embedded Cost of Preferred Stock as of September 30, 2020**  
**for Ameren Corporation & Ameren Missouri**

**Ameren Corporation**

(In millions)

---

Total Annual Cost: \$5.3

Total Carrying Value: \$130.2

---

Embedded Cost = Total Annual Cost/Total Carrying Value 4.09%

Note:

Source:

Staff Data Request No. 0187

**Ameren Missouri**

(In millions)

---

Total Annual Cost: \$3.4

Total Carrying Value: \$81.8

---

Embedded Cost = Total Annual Cost/Total Carrying Value 4.18%

Note:

Source:

Staff Data Request No. 0187

**Ameren Missouri**  
**Case No. ER-2022-0337**

**PROXY GROUP SCREENING DATA AND RESULTS**

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Edison Electric Institute (EEI) U.S. Investor-Owned Electric Utilities	Ticker	Stock Publicly Traded?	80% of Assets U.S. Regulated	At Least Investment Grade Credit Rating (S&P, Moody's)	Long-Term Growth Rates From at Least 2 Sources	Positive Dividend Payout Since 2018	At Least 60% of Regulated Income from Electric Utility Operations	At least 50% of Plant from Electric Utility	No Pending Merger or Acquisitions	Comparabl e Company Met All Criteria
ALLETE, Inc.	ALE	Yes	No	Yes (BBB, Baa1)	Yes	Yes	No	No	Yes	No
<b>Alliant Energy Corporation</b>	<b>LNT</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (A-, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Ameren Corporation</b>	<b>AEE</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, Baa1)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>American Electric Power Company, Inc.</b>	<b>AEP</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (A-, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Avangrid, Inc.	AGR	Yes	No	Yes (BBB+, Baa2)	Yes	No	Yes	Yes	No	No
<b>Avista Corporation</b>	<b>AVA</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Black Hills Corporation	BKH	Yes	Yes	Yes (BBB+, Baa2)	Yes	No	No	No	Yes	No
CenterPoint Energy, Inc.	CNP	Yes	Yes	Yes (BBB+, Baa2)	Yes	No	No	No	Yes	No
<b>CMS Energy Corporation</b>	<b>CMS</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Consolidated Edison, Inc.	ED	Yes	Yes	Yes (A-, Baa2)	Yes	Yes	Yes	No	Yes	No
Dominion Resources, Inc.	D	Yes	Yes	Yes (BBB+, Baa2)	Yes	No	No	No	Yes	No
DTE Energy Company	DTE	Yes	Yes	Yes (BBB+, Baa2)	Yes	No	No	No	Yes	No
<b>Duke Energy Corporation</b>	<b>DUK</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Edison International	EIX	Yes	Yes	Yes (BBB, Baa3)	Yes	Yes	Yes	No	Yes	No
<b>Entergy Corporation</b>	<b>ETR</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Eversource Energy	ES	Yes	Yes	Yes (A-, Baa1)	Yes	Yes	No	No	Yes	No
Exelon Corporation	EXC	Yes	No	Yes (BBB+, Baa2)	No	No	No	No	Yes	No
FirstEnergy Corp.	FE	Yes	Yes	Yes (BBB-, Ba1)	Yes	No	Yes	Yes	Yes	No
Hawaiian Electric Industries, Inc.	HE	Yes	No	No (BBB-, .)	Yes	No	Yes	Yes	Yes	No
<b>IDACORP, Inc.</b>	<b>IDA</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
MDU Resources Group, Inc.	MDU	Yes	No	No (BBB+, .)	Yes	Yes	Yes	Yes	Yes	No
<b>MGE Energy, Inc.</b>	<b>MGEE</b>	<b>Yes</b>	<b>Yes</b>	<b>No (. . .)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
NextEra Energy, Inc.	NEE	Yes	No	Yes (A-, Baa1)	Yes	Yes	Yes	Yes	Yes	No
NiSource Inc.	NI	Yes	Yes	Yes (BBB+, Baa2)	Yes	Yes	No	No	Yes	No
<b>Northwestern Corporation</b>	<b>NWE</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>OGE Energy Corp.</b>	<b>OGE</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, Baa1)</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Otter Tail Corporation	OTTR	Yes	Yes	Yes (BBB, Baa2)	Yes	Yes	No	No	Yes	No
PG&E Corporation	PCG	Yes	Yes	No (BB-, Ba2)	No	No	Yes	Yes	Yes	No
<b>Pinnacle West Capital Corporation</b>	<b>PNW</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, Baa1)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
PNM Resources, Inc.	PNM	Yes	Yes	Yes (BBB, Baa3)	Yes	Yes	Yes	Yes	Yes	Yes
<b>Portland General Electric Company</b>	<b>POR</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, A3)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
PPL Corporation	PPL	Yes	Yes	Yes (A-, Baa1)	No	No	No	No	No	No
Public Service Enterprise Group Incorporated	PEG	Yes	No	Yes (BBB+, Baa2)	Yes	Yes	No	No	Yes	No
Sempra	SRE	Yes	Yes	Yes (BBB+, Baa2)	Yes	Yes	No	No	Yes	No
<b>The Southern Company</b>	<b>SO</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (BBB+, Baa2)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Unitil Corporation	UTL	Yes	Yes	Yes (BBB+, Baa2)	No	Yes	No	Yes	Yes	No
WEC Energy Group, Inc.	WEC	Yes	Yes	Yes (A-, Baa1)	Yes	Yes	No	Yes	Yes	No
<b>Xcel Energy Inc.</b>	<b>XEL</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes (A-, Baa1)</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

Note:

- [1] Source: Edison Electric Institute, <https://www.eei.org/issues-and-policy/finance-and-tax#financialreview>.
- [2] Source: Edison Electric Institute, <https://www.eei.org/issues-and-policy/finance-and-tax#financialreview>.
- [3] Source: Edison Electric Institute, <https://www.eei.org/issues-and-policy/finance-and-tax#financialreview>.
- [4] Source: Edison Electric Institute, <https://www.eei.org/issues-and-policy/finance-and-tax#financialreview>.
- [5] Source: S&P Capital IQ Pro. Northwestern Corporation credit rating derived from Bulkley Workpapers.
- [6] Source: S&P Capital IQ Pro, Value Line Investment Survey, Yahoo! Finance, and Zacks.
- [7] Source: Value Line Investment Survey, Yahoo! Finance, and Zacks.
- [8] Source: SEC Form 10-K Filings.
- [9] Source: SEC Form 10-K Filings.
- [10] Source: Edison Electric Institute, <https://www.eei.org/issues-and-policy/finance-and-tax#financialreview>.



**Ameren Missouri**  
**Case No. ER-2022-0337**

**PROXY GROUP LIST**

Electric Utility Companies	Ticker
1 Alliant Energy Corporation	LNT
2 Ameren Corporation	AEE
3 American Electric Power Company, Inc.	AEP
4 Avista Corporation	AVA
5 CMS Energy Corporation	CMS
6 Duke Energy Corporation	DUK
7 Entergy Corporation	ETR
8 IDACORP, Inc.	IDA
9 Northwestern Corporation	NWE
10 Pinnacle West Capital Corporation	PNW
11 Portland General Electric Company	POR
12 The Southern Company	SO
13 Xcel Energy Inc.	XEL

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Growth Rate Estimates**  
**Based on Dividend per Share (DPS) and Earning per Share (EPS)**  
**for the Comparable Electric Utility Companies**

2022 Q3	Electric Utility Companies	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
			Past 10-Years			Past 5-Year			Projected			Average			Projected	
			EPS	DPS	BVPS	EPS	DPS	BVPS	EPS	DPS	BVPS	Projected	H.EPS	H.DPS	H.BVPS	Nominal GDP
1	Alliant Energy Corporation	LNT	7.00%	6.50%	5.50%	8.00%	6.50%	7.00%	6.00%	6.00%	5.00%	5.67%	7.50%	6.50%	6.25%	3.90%
2	Ameren Corporation	AEE	3.00%	3.00%	1.00%	7.50%	4.00%	4.50%	6.50%	7.00%	6.50%	6.67%	5.25%	3.50%	2.75%	3.90%
3	American Electric Power Company, Inc.	AEP	4.50%	5.00%	4.00%	4.00%	6.00%	3.50%	6.50%	6.00%	6.00%	6.17%	4.25%	5.50%	3.75%	3.90%
4	Avista Corporation	AVA	3.50%	5.50%	4.00%	3.50%	4.00%	3.50%	3.00%	4.00%	3.00%	3.33%	3.50%	4.75%	3.75%	3.90%
5	CMS Energy Corporation	CMS	7.50%	9.50%	5.50%	6.50%	7.00%	6.50%	6.50%	6.00%	7.00%	6.50%	7.00%	8.25%	6.00%	3.90%
6	Duke Energy Corporation	DUK	3.00%	3.00%	2.00%	4.50%	3.50%	4.00%	5.00%	2.00%	2.50%	3.17%	3.75%	3.25%	1.50%	3.90%
7	Entergy Corporation	ETR	0.00%	1.50%	1.50%	1.50%	2.00%	1.50%	4.00%	5.00%	5.00%	4.67%	0.75%	1.75%	1.50%	3.90%
8	IDACORP, Inc.	IDA	4.50%	8.50%	5.00%	4.00%	7.00%	4.50%	4.00%	6.50%	4.00%	4.83%	4.25%	7.75%	4.75%	3.90%
9	Northwestern Corporation	NWE	4.50%	5.50%	6.00%	2.00%	5.50%	4.50%	3.00%	2.00%	3.00%	2.67%	3.25%	5.50%	5.25%	3.90%
10	Pinnacle West Capital Corporation	PNW	6.00%	4.50%	4.00%	5.50%	5.50%	4.00%	0.50%	2.50%	2.50%	1.83%	5.75%	5.00%	4.00%	3.90%
11	Portland General Electric Company	POR	5.00%	4.50%	3.50%	4.50%	6.00%	3.00%	4.50%	6.00%	3.00%	4.50%	4.75%	5.25%	3.25%	3.90%
12	The Southern Company	SO	3.00%	3.50%	3.00%	3.00%	3.50%	2.50%	6.50%	3.50%	3.50%	4.50%	3.00%	3.50%	2.75%	3.90%
13	Xcel Energy Inc.	XEL	6.00%	5.50%	5.00%	6.00%	6.00%	5.00%	6.00%	6.50%	5.50%	6.00%	6.00%	5.75%	5.00%	3.90%
<b>Average</b>			<b>4.42%</b>	<b>5.08%</b>	<b>3.85%</b>	<b>4.65%</b>	<b>5.12%</b>	<b>3.92%</b>	<b>4.77%</b>	<b>4.85%</b>	<b>4.35%</b>	<b>4.65%</b>	<b>4.54%</b>	<b>5.10%</b>	<b>3.88%</b>	<b>3.90%</b>

2019 Q4	Electric Utility Companies	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
			Past 10-Years			Past 5-Year			Projected			Average			Projected	
			EPS	DPS	BVPS	EPS	DPS	BVPS	EPS	DPS	BVPS	Projected	H.EPS	H.DPS	H.BVPS	Nominal GDP
1	Alliant Energy Corporation	LNT	4.50%	7.50%	4.00%	4.50%	7.00%	4.50%	6.50%	5.50%	7.50%	6.50%	4.50%	7.25%	4.25%	3.90%
2	Ameren Corporation	AEE	0.50%	-3.50%	-0.50%	4.50%	2.50%	0.50%	6.50%	4.50%	5.50%	2.50%	-0.50%	0.00%	0.00%	3.90%
3	American Electric Power Company, Inc.	AEP	3.00%	4.50%	4.00%	5.00%	5.00%	3.50%	4.00%	5.50%	4.50%	4.67%	4.00%	4.75%	3.75%	3.90%
4	Avista Corporation	AVA	5.50%	8.50%	4.00%	5.00%	4.50%	4.50%	3.50%	4.00%	3.50%	3.67%	5.25%	6.50%	4.25%	3.90%
5	CMS Energy Corporation	CMS	10.00%	21.50%	4.50%	7.00%	7.00%	5.50%	7.00%	7.00%	7.00%	7.00%	8.50%	14.25%	5.00%	3.90%
6	Duke Energy Corporation	DUK	2.50%	7.00%	1.00%	0.50%	3.00%	1.50%	6.00%	2.50%	3.67%	1.50%	5.00%	1.25%	3.90%	
7	Entergy Corporation	ETR	0.50%	3.00%	1.00%	-0.50%	1.00%	-2.50%	2.00%	3.50%	4.50%	3.33%	0.00%	2.00%	-0.75%	3.90%
8	IDACORP, Inc.	IDA	7.00%	6.50%	5.50%	4.00%	10.00%	5.00%	3.50%	7.00%	4.00%	4.83%	5.50%	8.25%	5.25%	3.90%
9	Northwestern Corporation	NWE	8.50%	5.00%	5.50%	7.00%	7.00%	8.00%	3.00%	4.50%	3.50%	3.67%	7.75%	6.00%	6.75%	3.90%
10	Pinnacle West Capital Corporation	PNW	4.50%	2.50%	2.50%	5.00%	3.00%	4.50%	5.00%	6.00%	3.50%	4.83%	4.75%	2.75%	3.50%	3.90%
11	Portland General Electric Company	POR	3.50%	4.50%	2.50%	4.00%	4.50%	3.50%	4.50%	6.50%	3.00%	4.67%	3.75%	4.50%	3.00%	3.90%
12	The Southern Company	SO	3.00%	3.50%	4.00%	2.50%	3.50%	3.00%	3.50%	3.00%	3.50%	3.33%	2.75%	3.50%	3.50%	3.90%
13	Xcel Energy Inc.	XEL	5.50%	4.50%	4.50%	5.00%	6.00%	4.50%	5.50%	6.00%	5.00%	5.50%	5.25%	5.25%	4.50%	3.90%
<b>Average</b>			<b>4.50%</b>	<b>5.77%</b>	<b>3.27%</b>	<b>4.12%</b>	<b>4.92%</b>	<b>3.54%</b>	<b>4.65%</b>	<b>5.04%</b>	<b>4.42%</b>	<b>4.71%</b>	<b>4.31%</b>	<b>5.35%</b>	<b>3.40%</b>	<b>3.90%</b>

Note:

- [1] Source: The Value Line Investment Survey
- [2] Source: The Value Line Investment Survey
- [3] Source: The Value Line Investment Survey
- [4] Source: The Value Line Investment Survey
- [5] Source: The Value Line Investment Survey
- [6] Source: The Value Line Investment Survey
- [7] Source: The Value Line Investment Survey
- [8] Source: The Value Line Investment Survey
- [9] Source: The Value Line Investment Survey
- [10]  $=([7]+[8]+[9])/3$
- [11]  $=([1]+[4])/2$
- [12]  $=([2]+[5])/2$
- [13]  $=([3]+[6])/2$
- [14] Source: Congress Budget Office (CBO), Budget Economic Outlook

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Average High / Low Stock Prices**  
**for the Comparable Electric Utility Companies**

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	
<b>2022 Q3</b>		<b>July 2022</b>		<b>August 2022</b>		<b>September 2022</b>		Average High/Low Stock Price <small>(07/01/22 - 09/30/22)</small>	
Company Name	Ticker	High Stock Price	Low Stock Price	High Stock Price	Low Stock Price	High Stock Price	Low Stock Price		
1	Alliant Energy Corporation	LNT	\$ 58.57	\$ 57.41	\$ 62.86	\$ 61.85	\$ 61.05		\$ 59.66
2	Ameren Corporation	AEE	\$ 89.04	\$ 87.42	\$ 95.08	\$ 93.62	\$ 91.91	\$ 89.96	\$ 91.17
3	American Electric Power Company, Inc.	AEP	\$ 95.74	\$ 93.86	\$ 102.69	\$ 101.08	\$ 100.78	\$ 98.36	\$ 98.75
4	Avista Corporation	AVA	\$ 42.50	\$ 41.60	\$ 43.44	\$ 42.66	\$ 40.87	\$ 39.93	\$ 41.83
5	CMS Energy Corporation	CMS	\$ 66.83	\$ 65.53	\$ 69.73	\$ 68.70	\$ 67.09	\$ 65.58	\$ 67.24
6	Duke Energy Corporation	DUK	\$ 107.56	\$ 105.60	\$ 111.12	\$ 109.43	\$ 106.49	\$ 104.13	\$ 107.39
7	Entergy Corporation	ETR	\$ 111.81	\$ 109.59	\$ 119.94	\$ 117.96	\$ 115.50	\$ 112.75	\$ 114.59
8	IDACORP, Inc.	IDA	\$ 107.28	\$ 105.16	\$ 113.03	\$ 111.25	\$ 109.30	\$ 106.98	\$ 108.83
9	Northwestern Corporation	NWE	\$ 57.16	\$ 55.91	\$ 55.66	\$ 54.83	\$ 53.76	\$ 52.56	\$ 54.98
10	Pinnacle West Capital Corporation	PNW	\$ 71.87	\$ 70.39	\$ 76.83	\$ 75.60	\$ 74.17	\$ 72.53	\$ 73.57
11	Portland General Electric Company	POR	\$ 49.99	\$ 48.86	\$ 53.92	\$ 52.97	\$ 50.75	\$ 49.54	\$ 51.01
12	The Southern Company	SO	\$ 72.80	\$ 71.48	\$ 78.79	\$ 77.64	\$ 77.39	\$ 75.71	\$ 75.64
13	Xcel Energy Inc.	XEL	\$ 70.51	\$ 68.98	\$ 75.83	\$ 74.70	\$ 74.01	\$ 72.31	\$ 72.72
								\$	78.30

		<b>October 2019</b>		<b>November 2019</b>		<b>December 2019</b>		Average High/Low Stock Price <small>(10/01/19 - 12/31/19)</small>	
Company Name	Ticker	High Stock Price	Low Stock Price	High Stock Price	Low Stock Price	High Stock Price	Low Stock Price		
1	Alliant Energy Corporation	LNT	\$ 53.47	\$ 52.80	\$ 53.02	\$ 52.19	\$ 53.86		\$ 53.25
2	Ameren Corporation	AEE	\$ 77.75	\$ 76.76	\$ 75.69	\$ 74.66	\$ 75.70	\$ 74.86	\$ 75.90
3	American Electric Power Company, Inc.	AEP	\$ 93.88	\$ 92.78	\$ 91.36	\$ 90.16	\$ 93.25	\$ 92.28	\$ 92.29
4	Avista Corporation	AVA	\$ 48.36	\$ 47.74	\$ 47.33	\$ 46.72	\$ 48.08	\$ 47.49	\$ 47.62
5	CMS Energy Corporation	CMS	\$ 64.25	\$ 63.39	\$ 61.58	\$ 60.70	\$ 62.13	\$ 61.50	\$ 62.26
6	Duke Energy Corporation	DUK	\$ 95.89	\$ 94.90	\$ 89.96	\$ 88.76	\$ 90.16	\$ 89.25	\$ 91.49
7	Entergy Corporation	ETR	\$ 118.97	\$ 117.50	\$ 117.24	\$ 115.71	\$ 119.06	\$ 117.75	\$ 117.71
8	IDACORP, Inc.	IDA	\$ 110.46	\$ 109.16	\$ 105.50	\$ 103.96	\$ 106.29	\$ 105.17	\$ 106.76
9	Northwestern Corporation	NWE	\$ 74.70	\$ 73.71	\$ 70.84	\$ 69.91	\$ 71.80	\$ 70.94	\$ 71.98
10	Pinnacle West Capital Corporation	PNW	\$ 95.41	\$ 94.19	\$ 88.56	\$ 87.27	\$ 87.96	\$ 86.93	\$ 90.05
11	Portland General Electric Company	POR	\$ 56.84	\$ 56.13	\$ 55.96	\$ 55.18	\$ 55.76	\$ 55.19	\$ 55.84
12	The Southern Company	SO	\$ 61.84	\$ 61.13	\$ 62.34	\$ 61.58	\$ 62.82	\$ 62.03	\$ 61.96
13	Xcel Energy Inc.	XEL	\$ 64.15	\$ 63.29	\$ 61.63	\$ 60.70	\$ 62.91	\$ 62.16	\$ 62.47
								\$	76.11

Note:

[1] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[2] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[3] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[4] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[5] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[6] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[7] = ([1]+[2]+[3]+[4]+[5]+[6]) / 6

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Discounted Cash Flow (DCF) Costs of Common Equity (COE) Estimates**  
**Based on Dividend per Share, Earning per Share, Stock Price, and Growth Rate**  
**for the Comparable Electric Utility Companies**

<u>2022 Q3 DCF COE estimate</u>		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
Electric Utility Companies	Ticker	Dividend per Share	Stock Price	Dividend Yield	Expected Dividend Yield	Projected Weighted Growth	Projected GDP Growth	Projected Growth Rate	COE	
1	Alliant Energy Corporation	LNT	1.71	60.23	2.84%	2.91%	5.67%	3.90%	5.31%	8.23%
2	Ameren Corporation	AEE	2.36	91.17	2.59%	2.67%	6.67%	3.90%	6.11%	8.78%
3	American Electric Power Company	AEP	3.17	98.75	3.21%	3.30%	6.17%	3.90%	5.71%	9.02%
4	Avista Corporation	AVA	1.76	41.83	4.21%	4.28%	3.33%	3.90%	3.45%	7.73%
5	CMS Energy Corporation	CMS	1.84	67.24	2.74%	2.82%	6.50%	3.90%	5.98%	8.80%
6	Duke Energy Corporation	DUK	3.98	107.39	3.71%	3.77%	3.17%	3.90%	3.31%	7.08%
7	Entergy Corporation	ETR	4.09	114.59	3.57%	3.65%	4.67%	3.90%	4.51%	8.16%
8	IDACORP, Inc.	IDA	3.05	108.83	2.80%	2.87%	4.83%	3.90%	4.65%	7.51%
9	Northwestern Corporation	NWE	2.52	54.98	4.58%	4.65%	2.67%	3.90%	2.91%	7.56%
10	Pinnacle West Capital Corporation	PNW	3.44	73.57	4.68%	4.73%	1.83%	3.90%	2.25%	6.98%
11	Portland General Electric Company	POR	1.80	51.01	3.53%	3.61%	4.50%	3.90%	4.38%	7.99%
12	The Southern Company	SO	2.70	75.64	3.57%	3.65%	4.50%	3.90%	4.38%	8.03%
13	Xcel Energy Inc.	XEL	1.95	72.72	2.68%	2.76%	6.00%	3.90%	5.58%	8.34%
<u>Average</u>		2.64	78.30	3.44%	3.51%	4.65%	3.90%	4.50%	8.02%	
									DCF Lower Bound	7.30%
									DCF Upper Bound	8.79%
									Average	8.04%

<u>2019 Q4 DCF COE estimate</u>		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
Electric Utility Companies	Ticker	Dividend per Share	Stock Price	Dividend Yield	Expected Dividend Yield	Projected Weighted Growth	Projected GDP Growth	Projected Growth Rate	COE	
1	Alliant Energy Corporation	LNT	1.42	53.10	2.67%	2.75%	6.50%	3.90%	5.98%	8.73%
2	Ameren Corporation	AEE	1.92	75.90	2.53%	2.60%	5.50%	3.90%	5.18%	7.78%
3	American Electric Power Company	AEP	2.71	92.29	2.94%	3.00%	4.67%	3.90%	4.51%	7.52%
4	Avista Corporation	AVA	1.55	47.62	3.25%	3.32%	3.67%	3.90%	3.71%	7.03%
5	CMS Energy Corporation	CMS	1.53	62.26	2.46%	2.54%	7.00%	3.90%	6.38%	8.92%
6	Duke Energy Corporation	DUK	3.75	91.49	4.10%	4.18%	3.67%	3.90%	3.71%	7.89%
7	Entergy Corporation	ETR	3.66	117.71	3.11%	3.16%	3.33%	3.90%	3.45%	6.61%
8	IDACORP, Inc.	IDA	2.56	106.76	2.40%	2.45%	4.83%	3.90%	4.65%	7.10%
9	Northwestern Corporation	NWE	2.30	71.98	3.20%	3.25%	3.67%	3.90%	3.71%	6.97%
10	Pinnacle West Capital Corporation	PNW	3.04	90.05	3.38%	3.45%	4.83%	3.90%	4.65%	8.10%
11	Portland General Electric Company	POR	1.52	55.84	2.72%	2.78%	4.67%	3.90%	4.51%	7.30%
12	The Southern Company	SO	2.46	61.96	3.97%	4.04%	3.33%	3.90%	3.45%	7.49%
13	Xcel Energy Inc.	XEL	1.62	62.47	2.59%	2.66%	5.50%	3.90%	5.18%	7.84%
<u>Average</u>		2.31	76.11	3.02%	3.09%	4.71%	3.90%	4.54%	7.64%	
									DCF Lower Bound	7.00%
									DCF Upper Bound	8.42%
									Average	7.71%

**Comparison DCF Estimates**

2019 Q4 DCF COE estimate	7.71%
2022 Q1 DCF COE estimate	8.04%
Difference of Averages between Q2 2021 and Q1 2022	0.34%

Note:

- [1] Source: The Value Line Investment Survey: Ratings & Reports.
- [2] Source: The Wall Street Journal; Average Monthly Highest and Lowest.
- [3] = [1] / [2]
- [4] = [3] x (1 + .5 x [7])
- [5] Source: [10] of Schedule SJW-11
- [6] Source: Congress Budget Office (CBO), Budget Economic Outlook
- [7] = (4 x [5] + [6]) / 5
- [8] = [4] + [7]

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Capital Asset Pricing Model (CAPM) Costs of Common Equity (COE) Estimates**  
**Based on Historical Return Differences Between Common Stocks and Long-Term U.S. Treasuries**  
**for the Comparable Electric Utility Companies**

<u>2022 Q3 CAPM Estimate</u>	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
Electric Utility Companies	Risk-Free Rate	Beta	Duff&Phelps (1926-2021)				NYU Stern (1928-2021)				Market Risk Premium				CAPM Cost of Common Equity			
			Large Company Stocks		Long-term G-Bonds		S&P 500		US Treasury Bond		Duff&Phelps		NYU Stern		Duff&Phelps		NYU Stern	
			Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return
1 Alliant Energy Corporation	3.26%	0.85	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.18%	8.39%	7.63%	8.97%
2 Ameren Corporation	3.26%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.95%	8.09%	7.37%	8.63%
3 American Electric Power Company, Ir	3.26%	0.75	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.72%	7.79%	7.11%	8.30%
4 Avista Corporation	3.26%	0.95	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.64%	8.99%	8.14%	9.64%
5 CMS Energy Corporation	3.26%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.95%	8.09%	7.37%	8.63%
6 Duke Energy Corporation	3.26%	0.85	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.18%	8.39%	7.63%	8.97%
7 Entergy Corporation	3.26%	0.95	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.64%	8.99%	8.14%	9.64%
8 IDACORP, Inc.	3.26%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.95%	8.09%	7.37%	8.63%
9 Northwestern Corporation	3.26%	0.95	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.64%	8.99%	8.14%	9.64%
10 Pinnacle West Capital Corporation	3.26%	0.90	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.41%	8.69%	7.88%	9.30%
11 Portland General Electric Company	3.26%	0.85	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.18%	8.39%	7.63%	8.97%
12 The Southern Company	3.26%	0.95	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.64%	8.99%	8.14%	9.64%
13 Xcel Energy Inc.	3.26%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.95%	8.09%	7.37%	8.63%
Average	3.26%	0.86	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.23%	8.46%	7.68%	9.04%
																CAPM Lower Bound		7.23%
																CAPM Upper Bound		9.04%

- [1] Source: 3-Month Average of 30-Year Treasury Bond
- [2] Source: Value Line, Investment Survey.
- [3] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
- [4] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
- [5] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
- [6] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
- [7] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
- [8] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
- [9] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
- [10] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
- [11] = [3] - [5]
- [12] = [4] - [6]
- [13] = [7] - [9]
- [14] = [8] - [10]
- [15] = [1] + [2] x [11]
- [16] = [1] + [2] x [12]
- [17] = [1] + [2] x [13]
- [18] = [1] + [2] x [14]

**Ameren Missouri**  
**Case No. ER-2022-0337**

**AUTHORIZED RETURN ON EQUITY**

	<u>DCF COE</u>
2022 Q3 Estimate	8.04% <sup>A</sup>
2019 Q4 Estimate	7.71% <sup>B</sup>
COE Change	0.34% <sup>C</sup>
Last Authorized ROE (2019 Q4)	9.25% <sup>D</sup>
Estimated ROE (2021 Q3)	<u><u>9.59%</u></u> <sup>E</sup>

Note:

<sup>A</sup> Schedule SJW-d13

<sup>B</sup> Schedule SJW-d13

<sup>C</sup> = A - B

<sup>D</sup> Amended Report and Order in Case No. ER-2019-0374

<sup>E</sup> = C + D

**Ameren Missouri**  
**Case No. ER-2022-0337**

**ALLOWED RATE OF RETURN**

<u>Ameren Missouri</u>	<u>Allowed Rate of Return</u>				
<u>Capital Component</u>	<u>Percentage</u>	<u>Embedded</u>	<u>Lower</u>	<u>Common Equity Return of:</u>	<u>Upper</u>
	<u>of Capital</u>	<u>Cost</u>	<u>9.34%</u>	<u>ROE</u>	
				<u>9.59%</u>	<u>9.84%</u>
Common Stock Equity	51.84%	-	4.84%	4.97%	5.10%
Preferred Stock	0.66%	4.18% <sup>1</sup>	0.03%	0.03%	0.03%
Long-Term Debt	47.50%	3.92% <sup>2</sup>	1.86%	1.86%	1.86%
Total	<u>100.00%</u>		<u>6.73%</u>	<u>6.86%</u>	<u>6.99%</u>

Note:  
1 Schedule SJW-d7  
2 Schedule SJW-d8  
Reasonable Range / 2      0.005

**Ameren Missouri**  
**Case No. ER-2022-0337**

**Authorized ROE of the U.S Utility by Sector**  
**2010-2022**

<u>Year</u>	<u>Fully Litigated</u>		<u>Electric Settled</u>		<u>Electric Total</u>		<u>Fully Litigated</u>		<u>Gas Settled</u>		<u>Natural Gas Total</u>	
	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>
2010	10.35	27	10.39	34	10.37	61	10.08	27	10.30	12	10.15	39
2011	10.39	26	10.12	16	10.29	42	9.76	8	10.08	8	9.92	16
2012	10.28	29	10.06	29	10.17	58	9.92	21	9.99	14	9.94	35
2013	9.85	17	10.12	32	10.03	49	9.59	12	9.80	9	9.68	21
2014	10.05	21	9.73	17	9.91	38	9.98	15	9.51	11	9.78	26
2015	9.66	16	10.04	15	9.84	31	9.58	5	9.60	11	9.60	16
2016	9.74	25	9.80	17	9.77	42	9.61	10	9.50	16	9.54	26
2017	9.73	24	9.75	29	9.74	53	9.82	7	9.68	17	9.72	24
2018	9.63	22	9.57	26	9.60	48	9.59	17	9.59	23	9.59	40
2019	9.58	27	9.76	20	9.66	47	9.74	12	9.70	21	9.72	33
2020	9.43	32	9.46	23	9.44	55	9.44	12	9.48	23	9.47	35
2021	9.22	30	9.57	25	9.38	55	9.63	13	9.53	30	9.56	43
2022	9.49	34	9.64	20	9.55	54	9.70	12	9.48	23	9.55	35

Note:

Source: S&P Global Market Intelligence, Retrieved on January 3, 2023