COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF KENTUCKY UTILITIES COMPANY FOR AN ADJUSTMENT TO ITS ELECTRIC RATES, A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO DEPLOY ADVANCED METERING INFRASTRUCTURE, APPROVAL OF CERTAIN REGULATORY AND ACCOUNTING TREATMENTS, AND ESTABLISHMENT OF A ONE-YEAR SURCHARGE	))))))))))) **Case No. 2020-00349**
IN THE MATTER OF LOUISVILLE GAS AND ELECTRIC COMPANY FOR AN ADJUSTMENT TO ITS ELECTRIC AND GAS RATES, A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO DEPLOY ADVANCED METERING INFRASTRUCTURE, APPROVAL OF CERTAIN REGULATORY AND ACCOUNTING TREATMENTS, AND ESTABLISHMENT OF A ONE-YEAR SURCHARGE	)))))))))))) **Case No. 2020-00350**

Direct Testimony and Exhibits of

Christopher C. Walters

On behalf of

**United States Department of Defense and
all other Federal Executive Agencies**

March 5, 2021

BAI

BRUBAKER & ASSOCIATES, INC.

Project 11069.1

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STATE OF MISSOURI   )
)   **SS**
COUNTY OF ST. LOUIS   )

<u>VERIFICATION OF CHRISTOPHER C. WALTERS</u>

Christopher C. Walters, being first duly sworn, states the following: The prepared Direct Testimony and Exhibits constitutes the direct testimony of Affiant in the above-styled cases. Affiant states that he would give the answers set forth in the Direct Testimony if asked the questions propounded therein. Affiant further states that, to the best of his knowledge, his statements made are true and correct. Further affiant saith not.

_____
Christopher C. Walters

Subscribed and sworn to before me this 5th day of March, 2021.

_____
Notary Public

BRUBAKER & ASSOCIATES, INC.

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IN THE MATTER OF KENTUCKY UTILITIES COMPANY FOR AN ADJUSTMENT TO ITS ELECTRIC RATES, A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO DEPLOY ADVANCED METERING INFRASTRUCTURE, APPROVAL OF CERTAIN REGULATORY AND ACCOUNTING TREATMENTS, AND ESTABLISHMENT OF A ONE-YEAR SURCHARGE	))))))))))	Case No. 2020-00349
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Direct Testimony of Christopher C. Walters

1   **I. INTRODUCTION**

2 **Q**   **PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A   Christopher C. Walters. My business address is 16690 Swingley Ridge Road, Suite 140,

4   Chesterfield, MO 63017.

BRUBAKER & ASSOCIATES, INC.

1   **Q   WHAT IS YOUR OCCUPATION?**

2   A   I am a consultant in the field of public utility regulation and an Associate of the firm,

3   Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

4   **Q   PLEASE   DESCRIBE   YOUR   EDUCATIONAL   BACKGROUND   AND**

5   **EXPERIENCE.**

6   A   This information is included in Appendix A to this testimony.

7   **Q   ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?**

8   A   I am appearing in this proceeding on behalf of the United States Department of Defense

9   and all other Federal Executive Agencies ("DoD/FEA"). The DoD/FEA takes service

10   from Kentucky Utilities Company ("KU") and Louisville Gas and Electric Company

11   ("LG&E") (collectively, "Companies") on several electric and gas rate schedules.

12 **Q   WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

13 A   My testimony will address the current market cost of equity, and resulting overall rate

14   of return for the Companies. In my analyses, I consider the results of several market

15   models, the current and expected economic environment, as well as the outlook for the

16   regulated utility industry. I will also respond to the Companies' witness Mr. Adrien

17   McKenzie's recommended return on equity of 10.0%.

18   My silence in regard to any issue should not be construed as an endorsement of

19   the Companies' position.

1   **II. SUMMARY**

2   **Q   PLEASE SUMMARIZE THE BALANCE OF YOUR TESTIMONY.**

3   A   In Section III of my testimony, I review and analyze the regulated utility industry's

4   access to capital, credit rating trends and outlooks, as well as the overall trend in the

5   authorized return on equity ("ROE") for electric utilities throughout the country. I

6   conclude that the trend in authorized ROEs for electric utilities has declined over the

7   last several years and has remained below 10.0% more recently. I also review the impact

8   that the Federal Reserve's monetary policy actions have had on the cost of capital.

9   In Section IV of my testimony, I outline how a fair return on equity should be

10   established, provide an overview of the market's perception of the Companies'

11   investment risk, I comment on the Companies' proposed capital structure, and present

12   the analyses I relied on to estimate an appropriate ROE for LG&E and KU. Based on

13   the results of several cost of equity estimation methods performed on publicly traded

14   electric utility companies with comparable risk to the Companies, I estimate the current

15   fair market ROE for the Companies to fall within the range of 9.00% to 9.60%, with a

16   midpoint of 9.30%. As shown on my Exhibit CCW-1, my recommended ROE produces

17   an overall rate of return of 6.78% for LG&E and 6.80% for KU.

18   In Section V of my testimony, I respond to the Companies' witness Mr. Adrien

19   McKenzie's estimate of the current market cost of equity for LG&E and KU. Mr.

20   McKenzie recommends a cost of equity within the range of 9.4% to 10.6%, with a point

21   estimate of 10.0%. Mr. McKenzie's recommended range and ROE include an upward

22   adjustment of 10 basis points (0.10%) for flotation costs. I show that his estimates are

23   overstated and do not represent an accurate estimate of the current market cost of equity

1   for the Companies, and would be much higher than a fair and balanced ROE for

2   ratemaking purposes.

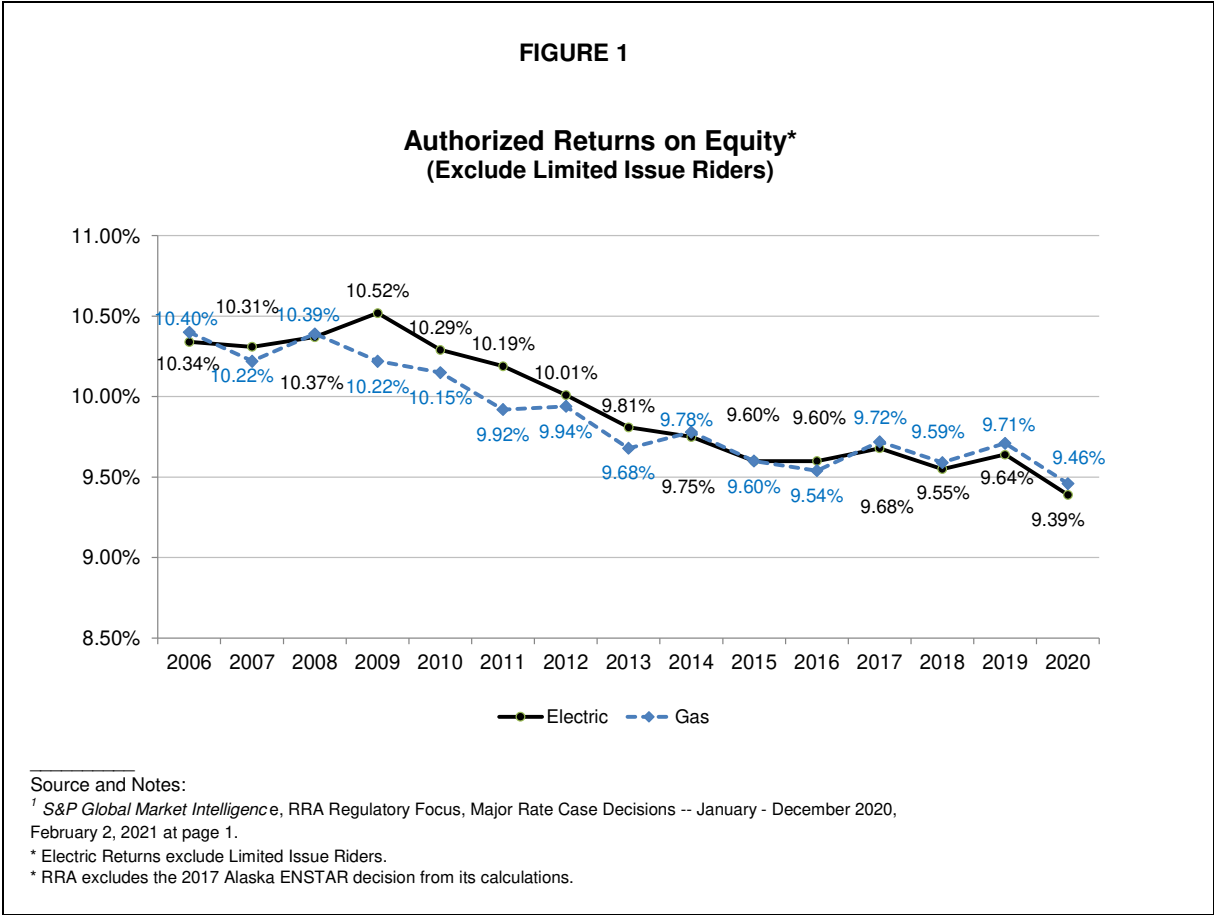3   In Section VI of my testimony, I provide my concluding comments.

4   **III. ACCESS TO CAPITAL AND ECONOMIC ENVIRONMENT**

5   **III.A. Electric Industry Authorized ROEs,**
6   **   Access to Capital, and Credit Strength**

7   **Q   PLEASE DESCRIBE THE OBSERVABLE EVIDENCE ON TRENDS IN**

8   **AUTHORIZED ROEs FOR ELECTRIC AND GAS UTILITIES, UTILITIES'**

9   **CREDIT STANDING, AND UTILITIES' ACCESS TO CAPITAL TO FUND**

10   **INFRASTRUCTURE INVESTMENT.**

11   A   Authorized ROEs for both electric and gas utilities have declined over the last ten years,

12   as illustrated in Figure 1, and have been reasonably stable well below 10.0% for about

13   the last six years.

FIGURE 1

Authorized Returns on Equity*
(Exclude Limited Issue Riders)

Source and Notes:
[1] *S&P Global Market Intelligenc*e, RRA Regulatory Focus, Major Rate Case Decisions -- January - December 2020,
February 2, 2021 at page 1.
* Electric Returns exclude Limited Issue Riders.
* RRA excludes the 2017 Alaska ENSTAR decision from its calculations.

1   **Q**   **PLEASE DESCRIBE THE DISTRIBUTION OF AUTHORIZED ROEs FOR**

2   **THE LAST FEW YEARS.**

3   A   The distribution of authorized returns, annually, since 2016 is summarized in Table 1.

TABLE 1

Distribution of Authorized ROEs
(All Electric Utilities)*

Line	Year	Average (1)	Median (2)	Share of Decisions ≤ 9.5% (3)	Share of Decisions ≤ 9.7% (4)
1	2016	9.60%	9.60%	41%	53%
2	2017[1]	9.67%	9.60%	42%	67%
3	2018[2]	9.54%	9.57%	47%	63%
4	2019	9.64%	9.65%	39%	58%
5	2020[3]	9.38%	9.48%	64%	79%

Source and Notes:
S&P Global Market Intelligence, data through 12/31/2020.
[1] Includes authorized base ROE of 9.4% for Nevada Power Company, which excludes incentives associated with the Lenzie facility.
[2] Includes authorized base ROE of 9.6% for Interstate Power & Light Co., which excludes allowed ROE for generating facilities subject to special ratemaking principles.
[3] Includes authorized base ROE of 9.8% for Interstate Power & Light Co., which excludes allowed ROE for generating facilities subject to special ratemaking principles.
*Excludes Limited Issue Rider Cases.

1   The distribution shows that over the last few years, the majority of authorized

2   ROEs since 2016 have been below 9.7%, with many of those being below 9.5%.

3 **Q   HOW HAS THE AUTHORIZED COMMON EQUITY RATIO FLUCTUATED**

4   **OVER THE SAME TIME PERIOD FOR ELECTRIC UTILITIES?**

5 A   In general, the electric utility industry's common equity ratio has not really deviated too

6   much from 50.0%. As shown in Table 2, I have provided the authorized common equity

1   ratios for electric utilities around the country, excluding the reported common equity

2   ratios for Arkansas, Florida, Michigan, and Indiana. I have excluded the reported

3   common equity ratios for these states because these jurisdictions include sources of

4   capital outside of investor-supplied capital such as accumulated deferred income taxes.

5   As such, the reported common equity ratios in these states would bias down the reported

6   permanent common equity ratios authorized for ratemaking purposes.

TABLE 2

Trends in State Authorized Common Equity Ratios
(Industry)

		Electric[1]	
Line	**Year**	**Average**	**Median**
	(1)	(2)	(3)
1	2016	49.70%	49.99%
2	2017	50.02%	49.85%
3	2018	50.60%	50.23%
4	2019	51.55%	51.37%
5	2020	50.94%	51.17%
6	Average	50.56%	50.52%
7	Min	49.70%	49.85%
8	Max	51.55%	51.37%

Source and Note:

[1] S&P Global Market Intelligence.

[2] Excludes Arkansas, Florida, Indiana, and Michigan.
because they include non-investor capital.

1 **Q HAVE REGULATED UTILITY COMPANIES BEEN ABLE TO MAINTAIN**

2 **STRONG CREDIT RATINGS DURING PERIODS OF DECLINING**

3 **AUTHORIZED RETURNS ON EQUITY?**

4 A Yes. The credit rating changes for the electric utility industry over the last several years

5 are the result of marked improvement in overall financial health and credit quality in

6 the industry. As shown below in Table 3, the credit rating of the industry has improved

7 over the last 10 years. More recently, a significant majority (72%) of the electric utility

8 companies have bond ratings in the range of BBB+ to A-. The Companies' A- bond

9 rating is among the strongest in the electric utility industry.

TABLE 3

S&P Ratings by Category
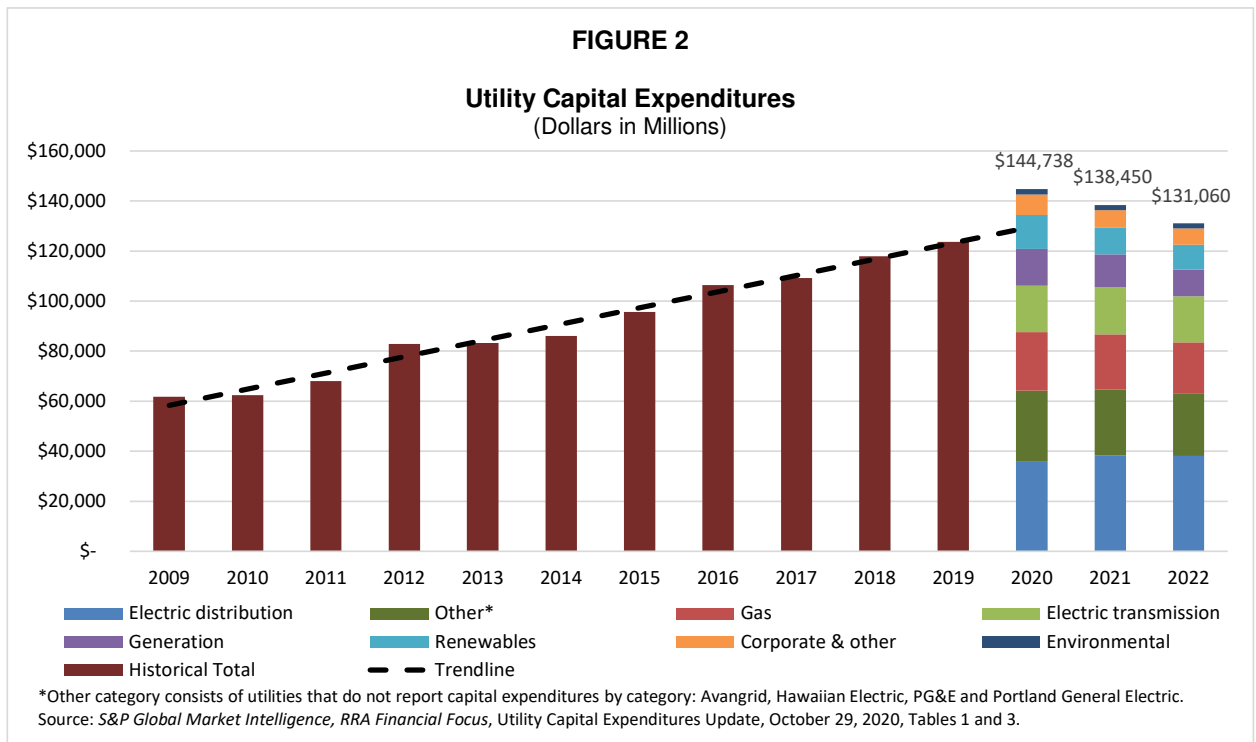**Electric Utility Subsidiaries**
(Year End)

Description	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
A or higher	12%	12%	12%	11%	13%	13%	13%	10%	10%	8%	14%	14%
A-	18%	20%	19%	22%	26%	26%	34%	43%	52%	54%	54%	53%
BBB+	23%	24%	28%	28%	25%	28%	24%	32%	21%	22%	18%	19%
BBB	36%	26%	24%	22%	26%	23%	18%	4%	7%	13%	12%	3%
BBB-	9%	16%	15%	17%	11%	11%	11%	11%	11%	2%	1%	1%
Below BBB-	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	10%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: S&P CAPITAL IQ, downloaded 02/18/21.
Notes: Value Line Electric Subsidiary ratings used.
  2020 increase in below investment grade ratings is due to FirstEnergy's bribery scandal and does not reflect risk to the industry as a whole.

---

10 **Q HAVE UTILITIES BEEN ABLE TO ACCESS EXTERNAL CAPITAL TO**

11 **SUPPORT INFRASTRUCTURE CAPITAL PROGRAMS?**

12 A Yes. In its October 2020 Utility Capital Expenditures Update report, *RRA Financial*

13 *Focus*, a division of S&P Global Market Intelligence, made several relevant comments

14 about utility investments generally:

1   • Projected 2020 capital expenditures for the 47 energy utilities in the
2   Regulatory Research Associates, a [*sic*] group within S&P Global
3   Market Intelligence, universe currently stands at roughly $141.3
4   billion, well above 2019's $120.7 billion in capital investment.

5   • 2019's energy capital expenditures were a record high, and 5% above
6   the $115.1 billion posted in 2018.

7   * * *

8   The nation's electric and gas utilities are investing in infrastructure to
9 upgrade aging transmission and distribution systems, build new natural
10 gas, solar and wind generation, and implement new technologies,
11 including smart meter deployment, smart grid systems, cybersecurity
12 measures and battery storage. We expect considerable levels of spending
13 to serve as the basis for solid profit expansion for the foreseeable future.[1]

14   As shown in Figure 2 below, capital expenditures for electric and natural gas

15 utilities have increased considerably over the period 2009 into 2020, and the forecasted

16 capital expenditures remain elevated, but slightly below current levels.

---

[1]*S&P Global Market Intelligence, RRA Financial Focus*: "Utility Capital Expenditures Update," October 29, 2020, at 1.

FIGURE 2

Utility Capital Expenditures
(Dollars in Millions)

*Other category consists of utilities that do not report capital expenditures by category: Avangrid, Hawaiian Electric, PG&E and Portland General Electric.
Source: *S&P Global Market Intelligence, RRA Financial Focus*, Utility Capital Expenditures Update, October 29, 2020, Tables 1 and 3.

1   As outlined in Figure 2 above, and in the comments made by *RRA S&P Global*

2   *Market Intelligence*, capital investments for the utility industry continue to stay at

3   elevated levels, and fuel utilities' profit expansion into the foreseeable future. This is

4   clear evidence that the capital investments are enhancing shareholder value, and are

5   attracting both equity and debt capital to the utility industry in a manner that allows for

6   these accelerated capital investment levels. While these profit-driven capital

7   investments are embraced by the capital markets, regulatory commissions also must

8   keep a careful view toward maintaining reasonable prices, and terms and conditions to

9   protect customers' need for reliable service at competitive prices.

1   **Q**   **IS THERE EVIDENCE OF ROBUST VALUATIONS OF REGULATED**

2   **UTILITY EQUITY SECURITIES?**

3   A   Yes. Robust valuations are an indication that utilities can sell securities at high prices,

4   which is a strong indication that they can access equity capital under reasonable terms

5   and conditions, and at relatively low cost. As shown on Exhibit CCW-2, the historical

6   valuation of electric utilities followed by *Value Line*, based on a price-to-earnings

7   ("P/E") ratio, price-to-cash flow ("P/CF") ratio, and market price-to-book value

8   ("M/B") ratio, indicates utility security valuations today are very strong and robust

9   relative to the last several years. These strong valuations of utility stocks indicate that

10   utilities have access to equity capital under reasonable terms and at lower costs.

11 **Q**   **HOW SHOULD THE COMMISSION USE THIS MARKET INFORMATION IN**

12   **ASSESSING A FAIR RETURN FOR THE COMPANIES?**

13 A   Observable market evidence is quite clear that capital market costs are near historically

14   low levels. While authorized ROEs have fallen to the mid 9.0% range, utilities continue

15   to have access to large amounts of external capital even as they are funding large capital

16   programs. Furthermore, utilities' investment-grade credit ratings are mostly stable and

17   have improved due, in part, to supportive regulatory treatment. The Commission should

18   carefully weigh all this important observable market evidence in assessing a fair ROE

19   for LG&E and KU.

1 **III.B. Regulated Utility Industry Outlook**

2 **Q   PLEASE DESCRIBE THE CREDIT RATING OUTLOOK FOR REGULATED**

3 **UTILITIES.**

4 A   The global economy has faced the extraordinary challenges of the novel Coronavirus,

5 which led to nearly a complete shutdown of the global economy. This unprecedented

6 event has impacted all sectors and capital markets. With regard to regulated utilities,

7 S&P made the following statement:

8 **Key Takeaways**

9 - Credit quality for the North American regulated utility industry
10 weakened in 2020. At the beginning of the year about 18% of the
11 industry had a negative outlook or ratings on CreditWatch with negative
12 implications. By the end of the year that percentage had doubled, to
13 about 36%.

14 - For the first time in a decade downgrades outpaced upgrades for the
15 predominately investment-grade industry.

16 - The industry generally performed well throughout the pandemic and we
17 expect it will continue to mostly manage through the remaining COVID-
18 19-related risks.

19 - The main causes of weakening credit quality reflected environment,
20 social, and governance (ESG) risks, regulatory issues, and companies'
21 practice of strategically managing financial measures close to their
22 downgrade threshold with little or no cushion.

23 - Despite our negative 2021 industry outlook, we expect a modest
24 improvement to credit quality over the next 12 months. We believe
25 Congress is more likely to raise the corporate tax rate, which would
26 improve the industry's financial measures, offset in part by a continued
27 focus on ESG risks.

28 *   *   *

29 **COVID-19 Was Not The Culprit For Weaker Credit Quality**

30 In March 2020, we identified five COVID-19-related risks that could
31 lead to a weakening of the industry's credit quality.

1   *   *   *

2   Encouragingly, the <u>industry has generally performed well throughout the</u>
3   <u>pandemic</u>. Lower electric and gas deliveries to C&I customers were
4   mostly offset by higher residential deliveries, the industry generally
5   worked well with regulators to defer COVID-19-related costs for future
6   recovery, market returns improved, and <u>the industry generally had</u>
7   <u>consistent access to the capital markets</u>. The one area that we saw some
8   weakness was with regard to rate cases. Many rate case filings were
9   delayed, rate case orders often took longer than expected, and many of
10   the orders were below expectations. This trend generally reflected the
11   weak economy caused by COVID-19 and the difficulties of passing on
12   higher costs to customers during the pandemic. We expect that as
13   vaccines take hold and the pandemic dissipates, the economy will
14   gradually recover, as will the industry's rate case performance.[2]

15   Moody's opines that there may be delays in rate case decisions due to

16   COVID-19, but views the regulated utilities resilient to withstand the current economic

17   situation. Specifically, Moody's states:

18   We are maintaining a <u>stable outlook</u> for the US regulated utilities
19   industry, reflecting our expectation for <u>continued strong regulatory</u>
20   <u>support</u>, <u>robust residential demand</u> and a <u>recovering economy in 2021</u>.
21   As a critical infrastructure sector with a regulated business model that
22   provides good cost recovery, <u>regulated utilities have remained relatively</u>
23   <u>resilient in the face of the uncertain economic environment caused by the</u>
24   <u>coronavirus pandemic.</u>

25   » **Following a decline in 2020 from last year's level, FFO-to-debt will**
26   **increase slightly on improving economic conditions.** We project an
27   aggregate industry funds from operations to debt ratio of around 15%
28   over the next 12 to 18 months, a slight improvement from an expected
29   decline to between 14% and 15% in 2020 from 15.8% in 2019. Our
30   expectation considers Moody's global macro outlook forecast of a 4.5%
31   growth in US GDP in 2021, although this will be closely tied to the
32   containment of the coronavirus. We expect continued strength in
33   residential demand, improving commercial and industrial load and
34   disciplined O&M cost management to maintain financial stability.
35   However, greater than usual use of debt financing will constrain FFO-
36   to-debt.

---

[2]*S&P Global Ratings*: "North American Regulated Utilities' Negative Outlook Could See Modest Improvement," January 20, 2021, at 1 and 3. (emphasis added).

1   » **Regulatory support to remain strong, although ROEs will be under**
2   **pressure.** We expect continued supportive regulatory frameworks to
3   underpin the sector's ability to recover costs in a timely manner and earn
4   a fair return even as allowed returns on equity (ROEs) remain under
5   pressure amid low interest rates. We expect most regulators to be
6   supportive of the recovery of coronavirus-related costs and investments,
7   as well as costs associated with the increasing frequency and severity of
8   climate hazards.[3]

9   Similarly, Fitch states:

10   **Fitch's Sector Outlook: Stable**

11   Fitch Ratings' stable outlook embeds an expectation that sector credit
12   metrics will begin to stabilize in 2020, driven by an increase in FFO after
13   the record capex in 2019 and conclusion of a majority of tax reform-
14   related refunds. Low commodity prices and interest rates, O&M cost
15   savings, in part due to the ongoing transition to cleaner generation mix,
16   and tax refunds are providing ample headroom to utilities to seek
17   recovery for capital investments without undue pressure on customer
18   bills.

19   *   *   *

20   **Rating Outlook: Stable**

21   With approximately 88% of ratings on Stable Outlook, we expect limited
22   rating movement in 2020.[4]

23 **Q   HOW IS THIS OBSERVABLE MARKET DATA USED IN FORMING YOUR**

24   **RECOMMENDED RETURN ON EQUITY AND OVERALL RATE OF**

25   **RETURN FOR NORTH SHORE?**

26 A   Generally, authorized returns on equity, credit standing, and access to capital have been

27   quite robust for utilities over the last several years. The COVID-19 pandemic is creating

---

[3]*Moody's Investors Service Sector Comment*: "2021 Outlook Stable On Strong
Regulatory Support and Robust Residential Demand," October 29, 2020 (emphasis added).
          [4]*Fitch Ratings*: "Fitch Ratings 2020 Outlook: North American Utilities, Power & Gas,"
December 4, 2019, (emphasis added).
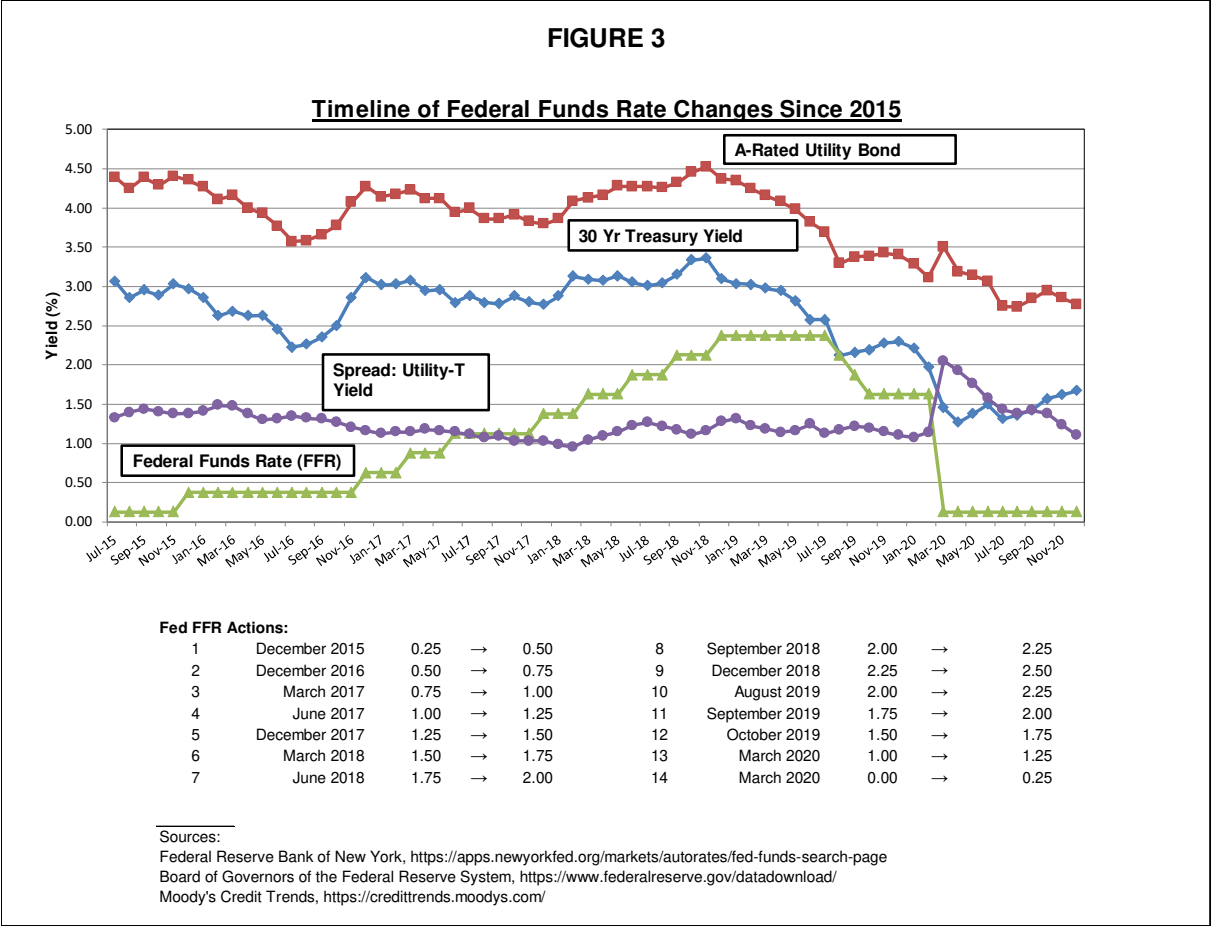
1   challenges for the U.S. economy as a whole, and utility companies more specifically.

2   However, like the U.S. economy, utilities are expected to weather the economic

3   downturn caused by the pandemic, and their financial strength will be restored as the

4   economy recovers. In the meantime, it is critical that the Commission ensure that rates

5   are increased no more than necessary to provide fair compensation and maintain

6   financial integrity, but be especially concerned about rate impacts on the service area

7   economies that are severely constrained due to the current economic conditions.

8   **III.C. Federal Reserve Monetary Policy**

9   **Q**   **DO YOU BELIEVE THAT THE FEDERAL RESERVE'S ACTIONS ARE**

10   **FULLY KNOWN BY MARKET PARTICIPANTS AND FULLY REFLECTED**

11   **IN THE VALUATION OF MARKET SECURITIES, BOTH DEBT AND**

12   **EQUITY?**

13   A   Yes, I do. While the Federal Reserve's previous actions on Quantitative Easing and

14   more recent reentry into both the Treasury, mortgage-backed security, and now to a

15   limited extent corporate bond market, the Federal Reserve's actions were done in order

16   to preserve stability and liquidity in the market and to calm the marketplace. These

17   Federal Reserve actions are not intended to drive down interest rates or manipulate the

18   market in any way. The effects of these measures, and the outlooks by independent

19   economists, continue to support the notion that capital market costs will stay low for the

20   extended period of time. Indeed, this is illustrated through a comparison of independent

21   economists' projections, effects on short-term market costs and long-term security

22   costs.

1   An assessment of the market's reaction to the Federal Reserve's impact on the

2   Federal Funds Rate or short-term markets is shown below in Figure 3.

FIGURE 3

Timeline of Federal Funds Rate Changes Since 2015

Fed FFR Actions:

1	December 2015	0.25	→	0.50	8	September 2018	2.00 →	2.25
2	December 2016	0.50	→	0.75	9	December 2018	2.25 →	2.50
3	March 2017	0.75	→	1.00	10	August 2019	2.00 →	2.25
4	June 2017	1.00	→	1.25	11	September 2019	1.75 →	2.00
5	December 2017	1.25	→	1.50	12	October 2019	1.50 →	1.75
6	March 2018	1.50	→	1.75	13	March 2020	1.00 →	1.25
7	June 2018	1.75	→	2.00	14	March 2020	0.00 →	0.25

Sources:
Federal Reserve Bank of New York, https://apps.newyorkfed.org/markets/autorates/fed-funds-search-page
Board of Governors of the Federal Reserve System, https://www.federalreserve.gov/datadownload/
Moody's Credit Trends, https://credittrends.moodys.com/

3   As shown in Figure 3 above, while the Federal Reserve has reduced short-term

4   interest rates currently, as it did back in the period prior to 2015, the market's valuation

5   of long-term securities remains relatively stable, and at very low costs. The Federal

6   Reserve's interaction in short-term securities is specifically stated to manage inflation

7   and support employment in the economy. The Federal Reserve's interaction in these

8   marketplaces is not to manipulate utility valuation or security valuations, or drive capital

1   market costs in one direction or the other. Rather, it is strictly for the purpose of

2   supporting the U.S. economy.

3   **Q   WHAT DO INDEPENDENT ECONOMISTS' OUTLOOKS FOR FUTURE**

4   **INTEREST RATES INDICATE?**

5   A   Independent economists expect the current low capital costs to prevail over at least the

6   intermediate term. This is illustrated in projections for both short- and long-term

7   changes in interest rates. Further, there is a clear trend in forecasted changes in interest

8   rates over time, indicating that capital market participants are becoming more

9   comfortable with today's low-cost capital market and expect it to prevail over at least

10   the intermediate future.

11   For example, short-term projections suggest that the market expects capital

12   market costs to remain relatively low. Table 4 below shows capital cost projections

13   over the next two years, and demonstrates that projected Treasry bond yields are not

14   expected to increase significantly over the next two years.

	TABLE 4								
	Blue Chip Financial Forecasts								
	Projected Federal Funds Rate, 30-Year Treasury Bond Yields, and GDP Price Index								

	2Q	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**
Publication Date	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**
Federal Funds Rate									
Aug-20	**0.1**	0.1	0.1	0.1	0.1	0.1	0.1		
Sep-20	**0.1**	0.1	0.1	0.1	0.1	0.1	0.1		
Oct-20		**0.1**	0.1	0.1	0.1	0.1	0.1	0.1	
Nov-20		0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Dec-20		0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Jan-21			**0.1**	0.1	0.1	0.1	0.1	0.1	0.1
T-Bond, 30 yr.									
Aug-20	**1.4**	1.4	1.5	1.6	1.7	1.8	1.9		
Sep-20	**1.4**	1.4	1.5	1.6	1.6	1.7	1.8		
Oct-20		**1.4**	1.5	1.6	1.6	1.7	1.8	1.9	
Nov-20		1.4	1.5	1.6	1.7	1.8	1.9	2.0	
Dec-20		1.4	1.6	1.6	1.8	1.8	1.9	2.0	
Jan-21			**1.6**	1.7	1.8	1.9	2.0	2.1	2.1
GDP Price Index									
Aug-20	**-1.8**	1.5	1.3	1.5	1.6	1.7	1.7		
Sep-20	**-2.0**	1.9	1.3	1.5	1.4	1.6	1.6		
Oct-20		**1.9**	1.5	1.7	1.5	1.7	1.7	1.8	
Nov-20		3.6	1.6	1.7	1.5	1.7	1.7	1.8	
Dec-20		3.6	1.7	1.7	1.8	1.8	1.8	1.8	
Jan-21			**1.6**	1.8	1.8	1.8	1.8	1.9	1.9

Source and Note:
 Blue Chip Financial Forecasts, August 2020 through January 2021.
 Actual Yields in Bold

1   Further, the outlook for long-term interest rates in an intermediate to longer term

2   is also impacted by the current Federal Reserve actions and the expectation that

3   eventually the Federal Reserve's monetary actions will return to more normal levels.

4   Its impacts in long-term interest rate projections are illustrated in Table 5 below.

TABLE 5

30-Year Treasury Bond Yield Actual Vs. Projection

Description	Quarterly Average	2-Year Projected	5- to 10-Year Projected
2015			
Q1	2.97%	4.00%	4.9% - 5.1%
Q2	2.55%	3.70%	
Q3	2.83%	4.00%	4.8% - 5.0%
Q4	2.84%	3.90%	
2016			
Q1	2.96%	3.80%	4.5% - 4.8%
Q2	2.72%	3.60%	
Q3	2.64%	3.40%	4.3% - 4.6%
Q4	2.29%	3.10%	
2017			
Q1	2.82%	3.70%	4.2% - 4.5%
Q2	3.05%	3.80%	
Q3	2.91%	3.70%	4.3% - 4.5%
Q4	2.82%	3.60%	
2018			
Q1	2.82%	3.60%	4.1% - 4.3%
Q2	3.02%	3.80%	
Q3	3.09%	3.80%	4.2% - 4.4%
Q4	3.07%	3.70%	
2019			
Q1	3.27%	3.40%	3.9% - 4.2%
Q2	3.01%	3.10%	
Q3	2.78%	2.60%	3.6% - 3.8%
Q4	2.30%	2.50%	
2020			
Q1	2.30%	2.60%	3.2% - 3.7%
Q2	1.89%	1.90%	
Q3	1.38%	1.90%	2.8% - 3.6%
Q4	1.36%	1.90%	

_____

Sources:

Blue Chip Financial Forecasts,
December 2013 through December 2020.

1   As shown in Table 5 above, independent economists' projections of changes in

2   long-term Treasury rates are very different today than they were over the last five to six

3   years. Specifically, in 2015 economists were expecting that Treasury bond yields,

4   which fell below 3%, would eventually return to the high 4-5% area. That outlook

5   largely remained through 2016, but the outlook for future capital market costs started to

6   decline in 2017. More recently, Treasury bond yields have dropped to historically low

7   levels but are expected to stay low for the next five to ten years.

8   Again, the market is fully aware of the Federal Reserve actions, and these actions

9   are not expected to have significant changes in capital market costs over the next five

10   to ten years. Further, these Federal Reserve actions are expected to maintain relatively

11   stable capital market costs over the next two years.

12   **III.D. COVID-19 Pandemic**

13   **Q   HAVE REGULATORY COMMISSIONS TAKEN SPECIFIC MEASURES TO**

14   **HELP PROTECT UTILITIES' ABILITY TO FULLY RECOVER THEIR COST**

15   **OF SERVICE DURING THE ECONOMIC DISTRESS CAUSED BY THE**

16   **COVID-19 PANDEMIC?**

17   A   Yes.   The Commissions have implemented measures that prohibit utilities from

18   disconnecting service for customers that are not paying their bill. While this is an

19   extraordinary measure, and exposes utility companies to increases in uncollectible

20   accounts expense, and waiver of certain utility fees, the Commissions have approved

21   regulatory mechanisms that allow utilities to defer uncollectible accounts, and certain

22   fees, and recover these from customers prospectively. Customers that pay their bills

1   will effectively make the utility whole and protect it from customers that are not able to

2   pay their bills during the national economic downturn.

3   The Commissions' regulatory mechanisms, while protecting customers to

4   receive essential utility services, were done in concert with the implementation of

5   regulatory mechanisms that preserved the utility's ability to fully recover its cost of

6   service. For these reasons, the economic turmoil caused by the current worldwide

7   pandemic has caused distress for regulatory utilities and its customers, but the

8   Commissions have mitigated the utilities' risk considerably with the implementation of

9   these regulatory mechanisms.

10   **IV. RETURN ON EQUITY**

11 **Q**   **PLEASE DESCRIBE WHAT IS MEANT BY A "UTILITY'S COST OF**

12   **COMMON EQUITY."**

13 A   A utility's cost of common equity is the expected return that investors require on an

14   investment in the utility. Investors expect to earn their required return by receiving

15   dividends and through stock price appreciation.

16 **Q**   **PLEASE DESCRIBE THE FRAMEWORK FOR DETERMINING A**

17   **REGULATED UTILITY'S COST OF COMMON EQUITY.**

18 A   In general, determining a fair cost of common equity for a regulated utility has been

19   framed by two hallmark decisions of the U.S. Supreme Court: *Bluefield Water Works*

20   *& Improvement Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679 (1923) and *Fed.*

21   *Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

1   These decisions identify the general financial and economic standards to be

2   considered in establishing the cost of common equity for a public utility. Those general

3   standards provide that the authorized return should: (1) be sufficient to maintain

4   financial integrity; (2) attract capital under reasonable terms; and (3) be commensurate

5   with returns investors could earn by investing in other enterprises of comparable risk.

6 **Q   PLEASE DESCRIBE THE METHODS YOU HAVE USED TO ESTIMATE**

7 **LG&E'S AND KU'S COST OF COMMON EQUITY.**

8 A   I have used several models based on financial theory to estimate LG&E's and KU's cost

9   of common equity. These models are: (1) a constant growth Discounted Cash Flow

10   ("DCF") model using the consensus of analysts' growth rate projections; (2) a constant

11   growth DCF using sustainable growth rate estimates; (3) a multi-stage DCF model; (4) a

12   Risk Premium model; and (5) a Capital Asset Pricing Model ("CAPM"). I have applied

13   these models to a group of publicly traded utilities with investment risk similar to LG&E

14   and KU.

15 **IV.A. The Companies' Investment Risk**

16 **Q   PLEASE DESCRIBE THE MARKET'S ASSESSMENT OF THE INVESTMENT**

17 **RISK OF LG&E AND KU.**

18 A   In order to estimate a fair return on equity for the Companies, an assessment of their

19   investment risk must be done. The market's assessment of their investment risk is best

20   described by credit rating analysts' reports. Both LG&E and KU have current corporate

21   bond ratings from Standard and Poor's ("S&P") and Moody's of A- and A3,

1   respectively.[5]   The Companies' outlook from S&P and Moody's is "Stable."   For

2   example, in its most recent report on LG&E, S&P specifically stated:

3   **Outlook: Stable**

4   The stable outlook on LG&E reflects our <u>stable outlook</u> on its
5   parent, PPL Corp., over the next 24 months. The stable outlook on PPL
6   reflects our excellent assessment of its business risk profile, which we
7   consider to be at the stronger end of our range for an excellent
8   assessment.   It also incorporates our significant assessment of the
9   company's financial risk profile, which we believe is at the weaker end
10   of our range for a significant assessment. Under our base-case scenario,
11   PPL's adjusted funds from operations (FFO)-to-debt ratio will average
12   about 14% while its adjusted debt to EBITDA remains elevated at about
13   5x.

14   *   *   *

15   **Business Risk: Excellent**

16   Our assessment of LG&E's business risk profile primarily reflects its
17   regulated utilities, which comprise vertically integrated electric and
18   natural gas distribution operations, and Kentucky's generally
19   <u>constructive regulatory framework.</u>

20   With a customer base of about 400,000 electric and about 320,000
21   natural gas customers, LG&E has some scale. In addition, <u>its largely</u>
22   <u>residential and commercial customer base insulates it against</u>
23   <u>fluctuations in demand and stabilizes its cash flows.</u> Our assessment
24   also incorporates the company's moderate operating diversity due to its
25   electric and natural gas operations.

26   The company has about 3,000 megawatts of generation capacity, which
27   entails greater operating risk than its transmission and distribution
28   operations. The company has been upgrading its coal-fired generation
29   plants to comply with environmental regulations. While the capital
30   costs for these upgrades are significant, LG&E can recover these costs
31   through an <u>environmental cost recovery mechanism</u>, which <u>limits its</u>
32   <u>regulatory lag and supports its credit profile</u>. The company is regulated
33   by the Kentucky Public Service Commission and <u>benefits from other</u>
34   <u>mechanisms, such as a gas line tracker and a pass-through fuel cost</u>
35   <u>mechanism, that help stabilize its returns.</u> Moreover, LG&E's low-cost,

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[5]S&P Global Market Intelligence.

1   coal-fired generation and efficient operations contribute to the overall
2   competitive rates it offers its customers.

3   *   *   *

4   **Financial Risk: Significant**

5   Under our base-case scenario, we expect that LG&E's adjusted FFO to
6   debt will be in the 19%-21% range in 2020 as it <u>no longer experiences</u>
7   <u>the negative effects of U.S. tax reform.</u> Additionally, we foresee some
8   uplift because the company will increase its regular base rate and
9   recovery. This uplift is offset by LG&E's ongoing discretionary cash
10   flow deficits due to its heightened capital expenditure, which we expect
11   it will fund, at least partly, with external debt. We anticipate that the
12   company's debt leverage will remain about 3.8x.

13   In 2021 and 2022, we anticipate that LG&E's cost recovery and
14   potential rate cases will be offset by its increased capital spending and
15   elevated dividend program, which will slightly weaken its credit
16   measures. We base our risk assessment on our <u>medial volatility table</u>
17   benchmarks, which are more relaxed than the benchmarks we use for
18   a typical corporate issuer. <u>This reflects the company's steady cash</u>
19   <u>flow, rate-regulated utility operations, and effective regulatory risk</u>
20   <u>management</u>.[6]

21 **IV.B. The Companies' Proposed Capital Structures**

22 **Q**   **WHAT CAPITAL STRUCTURES ARE THE COMPANIES REQUESTING?**

23 A   The proposed capital structures for the Companies are shown in Table 6:

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[6]*Standard & Poor's RatingsDirect:* "Louisville Gas & Electric Co.," March 16, 2020 at 4-6.

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┌─────────────────────────────────────────────────────────────┐
│                                                               │
│                          TABLE 6                              │
│                                                               │
│         The Companies' Proposed Capital Structure             │
│                                                               │
│                                                               │
│                                                               │
│          Description             LG&E          KU             │
│                                                               │
│   Short-Term Debt                1.53%        2.46%           │
│   Long-Term Debt                45.34%       44.41%           │
│   Common Equity                 53.13%       53.14%           │
│   Total Capital Structure      100.00%      100.00%           │
│   _____                                            │
│                                                               │
│   Source:   Schedule J-1.                                     │
│                                                               │
└─────────────────────────────────────────────────────────────┘
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1 **Q**   **DO YOU HAVE ANY COMMENTS ON THE REQUESTED CAPITAL**

2   **STRUCTURE FOR THE FORECASTED TEST YEAR?**

3 A   Yes. The Companies' requested common equity ratio of approximately 53.1% is

4   significantly higher than the average common equity ratio of my proxy group discussed

5   below, as well as the typical common equity ratio being authorized around the country.

6   While I do not make an explicit adjustment to my recommended return on equity to

7   account for the lower level of financial risk associated with a higher common equity

8   ratio, I have taken it into consideration in developing my recommended range and

9   return.

1 **IV.C. Risk Proxy Group**

2 **Q** **PLEASE DESCRIBE HOW YOU IDENTIFIED A PROXY GROUP THAT**

3 **COULD BE USED TO ESTIMATE LG&E'S CURRENT MARKET COST OF**

4 **EQUITY.**

5 A To limit the issues surrounding a fair ROE, I have relied on the same proxy group

6 developed by the Companies' witness Mr. McKenzie, with one exception. I have

7 excluded Algonquin Power

8 **Q** **PLEASE DESCRIBE HOW YOUR PROXY GROUP'S INVESTMENT RISK**

9 **COMPARES TO LG&E.**

10 A The proxy group shown in Exhibit CCW-3 has an average corporate credit rating from

11 S&P of BBB+, which is one notch below the Companies' rating of A-. The proxy group

12 has an average corporate credit rating from Moody's of Baa1, which is also a notch

13 below the Companies' credit rating from Moody's of A3. Based on these credit ratings

14 parameters, I conclude that the Companies are less risky than the proxy group.

15 As also shown on my Exhibit CCW-3, the proxy group has an average and

16 median common equity ratio (including short-term debt) as reported by S&P Global

17 Market Intelligence ("MI") of 42.9% and 43.7%, respectively. Similarly, as reported

18 by *The Value Line Investment Survey* ("*Value Line*"), the proxy group has an average

19 and median common equity ratio (excluding short-term debt) of 46.8% and 46.9%,

20 respectively. In this regard, the Companies' proposed common equity ratio of

21 approximately 53.1% including short-term debt is higher than the average and median

22 common equity ratios of the proxy group. As I stated above, given the substantial

1   discrepancy in the Companies' common equity ratio relative to the industry generally,

2   and the proxy group specifically, an ROE in the lower half of my range could be

3   warranted should the Commission adopt the Companies' proposed common equity

4   ratio.

5   **IV.D. Discounted Cash Flow Model**

6   **Q   PLEASE DESCRIBE THE DCF MODEL.**

7   A   The DCF model posits that a stock price equals the sum of the present value of expected

8   future cash flows discounted at the investor's required rate of return or cost of capital.

9   This model is expressed mathematically as follows:

10           $$P_0 = \frac{D_1}{(1+K)^1} + \frac{D_2}{(1+K)^2} \ldots \frac{D_\infty}{(1+K)^\infty} \qquad \text{(Equation 1)}$$
11

12   P_0 = Current stock price
13   D = Dividends in periods 1 - ∞
14   K = Investor's required return

15   This model can be rearranged in order to estimate the discount rate or investor-required

16   return, known as "K." If it is reasonable to assume that earnings and dividends will

17   grow at a constant rate, then Equation 1 can be rearranged as follows:

18           $$K = D_1/P_0 + G \qquad \text{(Equation 2)}$$

19   K = Investor's required return
20   D_1 = Dividend in first year
21   P_0 = Current stock price
22   G = Expected constant dividend growth rate

23   Equation 2 is referred to as the annual "constant growth" DCF model.

1   **Q**   **PLEASE DESCRIBE THE INPUTS TO YOUR CONSTANT GROWTH DCF**

2   **MODEL.**

3   A   As shown in Equation 2 above, the DCF model requires a current stock price, expected

4   dividend, and expected growth rate in dividends.

5   **Q**   **WHAT STOCK PRICE HAVE YOU RELIED ON IN YOUR CONSTANT**

6   **GROWTH DCF MODEL?**

7   A   I relied on the average of the weekly high and low stock prices of the utilities in the

8   proxy group over a 13-week period ending on January 22, 2021. An average stock price

9   is less susceptible to market price variations than a price at a single point in time.

10   Therefore, an average stock price is less susceptible to aberrant market price

11   movements, which may not reflect the stock's long-term value.

12   **Q**   **WHAT DIVIDEND DID YOU USE IN YOUR CONSTANT GROWTH DCF**

13   **MODEL?**

14   A   I used the most recently paid quarterly dividend as reported in *Value Line*.[7] This

15   dividend was annualized (multiplied by 4) and adjusted for next year's growth to

16   produce the D_1 factor for use in Equation 2 above. In other words, I calculate D_1 by

17   multiplying the annualized dividend (D_0) by $(1+G)$.

---

[7]*The Value Line Investment Survey*, November 13, December 11, 2020, and January 22, 2021.

1 **Q** **WHAT DIVIDEND GROWTH RATES HAVE YOU USED IN YOUR**

2 **CONSTANT GROWTH DCF MODEL?**

3 A There are several methods that can be used to estimate the expected growth in dividends.

4 However, regardless of the method, for purposes of determining the market-required

5 return on common equity, one must attempt to estimate investors' expectations about

6 what the dividend, or earnings growth rate will be and not what an individual investor

7 or analyst may use to make individual investment decisions.

8 As predictors of future returns, securities analysts' growth estimates have been

9 shown to be more accurate than growth rates derived from historical data.[8] That is,

10 assuming the market generally makes rational investment decisions, analysts' growth

11 projections are more likely to influence investors' decisions, which are captured in

12 observable stock prices, than growth rates derived only from historical data.

13 For my constant growth DCF analysis, I have relied on a consensus, or mean, of

14 professional securities analysts' earnings growth estimates as a proxy for investors'

15 dividend growth rate expectations. I used the average of analysts' growth rate estimates

16 from three sources: Zacks, MI, and Yahoo! Finance. All such projections were available

17 on January 22, 2021, and all were reported online.

18 Each growth rate projection is based on a survey of independent securities

19 analysts. There is no clear evidence whether a particular analyst is most influential on

20 general market investors. Therefore, a single analyst's projection does not as reliably

21 predict investor outlooks as does a consensus of market analysts' projections. The

---

[8]*See, e.g.,* David Gordon, Myron Gordon, and Lawrence Gould, "Choice Among Methods of Estimating Share Yield," *The Journal of Portfolio Management*, Spring 1989.

1   consensus of estimates is a simple arithmetic average, or mean, of surveyed analysts'

2   earnings growth forecasts. A simple average of the growth forecasts gives equal weight

3   to all surveyed analysts' projections. Therefore, a simple average, or arithmetic mean,

4   of analyst forecasts is a good proxy for investor expectations.

5   The growth rates I used in my DCF analysis are shown in Exhibit CCW-4. The

6   average growth rate for my proxy group is 5.32%, while the median growth rate is

7   5.66%.

8   **Q**   **WHAT ARE THE RESULTS OF YOUR CONSTANT GROWTH DCF MODEL?**

9   A   As shown in Exhibit CCW-5, the average and median constant growth DCF returns for

10   my proxy group for the 13-week analysis are 8.96% and 9.26%, respectively.

11 **Q**   **DO YOU HAVE ANY COMMENTS ON THE RESULTS OF YOUR CONSTANT**

12   **GROWTH DCF ANALYSIS?**

13 A   Yes. The constant growth DCF analysis for my proxy group is based on a group average

14   long-term sustainable growth rate of 5.32%. The three- to five-year growth rates are

15   higher than the long-term projected GDP growth rate of 4.35%, described below.

16 **Q**   **HOW DID YOU IDENTIFY THE LONG-TERM PROJECTED GDP GROWTH**

17   **RATE?**

18 A   *Blue Chip Financial Forecasts,* which is a well-respected and often-cited publication,

19   projects that over the next 5 and 10 years, the U.S. nominal GDP will grow at an annual

20   rate of approximately 4.35%. These GDP growth projections reflect two components:

1   (1) a real growth outlook of around 2.25%; and (2) an inflation outlook of around 2.10%

2   going forward. As such, the average growth rate over the next 10 years is around 4.35%,

3   which I believe is a reasonable proxy of long-term sustainable growth.[9]

4   In my multi-stage DCF analysis, I discuss academic and investment practitioner

5   support for using the projected long-term GDP growth outlook as a maximum

6   sustainable growth rate projection. A long-term sustainable growth rate for a utility

7   stock cannot exceed the growth rate of the economy in which it sells its goods and

8   services. Therefore, using the long-term GDP growth rate as a conservative projection

9   for the maximum sustainable growth rate is logical, and is generally consistent with

10   economic theory and practice.

11   **IV.E. Sustainable Growth DCF**

12   **Q   PLEASE DESCRIBE WHAT THE SUSTAINABLE GROWTH DCF METHOD**

13   **IS AND HOW YOU ESTIMATED A SUSTAINABLE GROWTH RATE FOR**

14   **YOUR SUSTAINABLE GROWTH DCF MODEL.**

15   A   A sustainable growth rate, also known as the internal growth rate, is based on the

16   percentage of the utility's earnings that is retained and reinvested in utility plant and

17   equipment. These reinvested earnings increase the earnings base (rate base). Earnings

18   grow when plant funded by reinvested earnings is put into service, and the utility is

19   allowed to earn its authorized return on such additional rate base investment.

20   The internal growth methodology is tied to the percentage of earnings retained

21   in the Company and not paid out as dividends. The earnings retention ratio is 1 minus

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[9]*Blue Chip Financial Forecasts,* December 1, 2020, at 14.

1   the dividend payout ratio. As the payout ratio declines, the earnings retention ratio

2   increases. An increased earnings retention ratio will fuel stronger growth because the

3   business funds more investments with retained earnings.

4   The payout ratios of the proxy group are shown in my Exhibit CCW-6. These

5   dividend payout ratios and earnings retention ratios then can be used to develop a

6   sustainable long-term earnings retention growth rate. A sustainable long-term earnings

7   retention ratio will help gauge whether analysts' current three- to five-year growth rate

8   projections can be sustained over an indefinite period of time.

9   The data used to estimate the long-term sustainable growth rate is based on the

10   Company's current market-to-book ratio and on *Value Line*'s three- to five-year

11   projections of earnings, dividends, earned returns on book equity, and stock issuances.

12   As shown in Exhibit CCW-7, based on my 13-week average stock price, the

13   average and median sustainable growth rate for the proxy group using this internal

14   growth rate model are 4.76% and 4.55%, respectively.

15   **Q   WHAT IS THE DCF ESTIMATE USING THESE SUSTAINABLE GROWTH**

16   **RATES?**

17   A   A DCF estimate based on these sustainable growth rates is developed in Exhibit CCW-

18   8. As shown there, and using the same formula in Equation 2 above, a sustainable

19   growth DCF analysis produces proxy group average and median DCF results for the

20   13-week period of 8.38% and 8.27%, respectively.

1   **IV.F. Multi-Stage DCF Model**

2   **Q   HAVE YOU CONDUCTED ANY OTHER DCF STUDIES?**

3   A   Yes. As previously indicated, the DCF is designed to reflect a present value of an

4   infinite string of future cash flow. That said, however, my first constant growth DCF is

5   based on the analyst growth rate projections, so it is a reasonable reflection of rational

6   investment expectations over the next three- to five- years. The limitation on this

7   constant growth DCF model is that it cannot reflect a rational expectation that a period

8   of high or low short-term growth can be followed by a change in growth to a rate that is

9   more reflective of long-term sustainable growth. In order to account for the outlook of

10   changing growth expectations, I performed a multi-stage DCF analysis.

11   **Q   WHY DO YOU BELIEVE GROWTH RATES CAN CHANGE OVER TIME?**

12   A   Analyst-projected growth rates over the next three to five years will change as utility

13   earnings growth outlooks change. Utility companies go through cycles in making

14   investments in their systems. When utility companies are making large investments,

15   their rate base grows rapidly, which in turn accelerates earnings growth. Once a major

16   construction cycle is completed or levels off, growth in the utility rate base slows and

17   its earnings growth slows from an abnormally high three- to five-year rate to a lower

18   sustainable growth rate.

19   As major construction cycles extend over longer periods of time, even with an

20   accelerated construction program, the growth rate of the utility will slow simply because

21   rate base growth will slow and the utility has limited human and capital resources

22   available to expand its construction program. Therefore, the three- to five-year growth

1   rate projection should be used as a long-term sustainable growth rate, but not without

2   making a reasonable informed judgment to determine whether it considers the current

3   market environment, the industry, and whether the three- to five-year growth outlook is

4   sustainable.

5   **Q   PLEASE DESCRIBE YOUR MULTI-STAGE DCF MODEL.**

6   A   The multi-stage DCF model reflects the possibility of non-constant growth for a

7   Company over time. The multi-stage DCF model reflects three growth periods: (1) a

8   short-term growth period consisting of the first five years; (2) a transition period,

9   consisting of the next five years (6 through 10); and (3) a long-term growth period

10   starting in year 11 and extending into perpetuity.

11   For the short-term growth period, I relied on the consensus of analysts' growth

12   projections described above in relationship to my constant growth DCF model. For the

13   transition period, the growth rates were reduced or increased by an equal factor

14   reflecting the difference between the analysts' growth rates and the long-term

15   sustainable growth rate. For the long-term growth period, I assumed each Company's

16   growth would converge to the maximum sustainable long-term growth rate.

17 **Q   WHY IS THE GDP GROWTH PROJECTION A REASONABLE PROXY FOR**

18   **THE MAXIMUM SUSTAINABLE LONG-TERM GROWTH RATE?**

19 A   Utilities cannot indefinitely sustain a growth rate that exceeds the growth rate of the

20   economy in which they sell services. Utilities' earnings/dividend growth is created by

21   increased utility investment or rate base. Such investment, in turn, is driven by service

1   area economic growth and demand for utility service. In other words, utilities invest in

2   plant to meet sales demand growth. Sales growth, in turn, is tied to economic growth

3   in their service areas.

4   The U.S. Department of Energy, Energy Information Administration ("EIA")

5   has observed that utility sales growth tracks U.S. GDP growth, albeit at a lower level,

6   as shown in Exhibit CCW-9. Utility sales growth has lagged behind GDP growth for

7   more than a decade. As a result, nominal GDP growth is a very conservative proxy for

8   utility sales growth, rate base growth, and earnings growth. Therefore, the U.S. GDP

9   nominal growth rate is a conservative proxy for the highest sustainable long-term

10   growth rate of a utility.

11   **Q   IS THERE RESEARCH THAT SUPPORTS YOUR POSITION THAT, OVER**

12   **THE LONG TERM, A COMPANY'S EARNINGS AND DIVIDENDS CANNOT**

13   **GROW AT A RATE GREATER THAN THE GROWTH OF THE U.S. GDP?**

14   A   Yes. This concept is supported in published analyst literature and academic work.

15   Specifically, in a textbook titled "Fundamentals of Financial Management," published

16   by Eugene Brigham and Joel F. Houston, the authors state as follows:

17   The constant growth model is most appropriate for mature Companies
18   with a stable history of growth and stable future expectations. Expected
19   growth rates vary somewhat among Companies, but <u>dividends for
20   mature firms are often expected to grow in the future at about the same
21   rate as nominal gross domestic product (real GDP plus inflation)</u>.[10]

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[10] *"Fundamentals of Financial Management*," Eugene F. Brigham and Joel F. Houston, Eleventh Edition 2007, Thomson South-Western, a Division of Thomson Corporation at 298 (emphasis added).

1   The use of the economic growth rate is also supported by investment practitioners as

2   outlined as follows:

3   **Estimating Growth Rates**

4   One of the advantages of a three-stage discounted cash flow model is
5   that it fits with life cycle theories in regards to Company growth. In these
6   theories, Companies are assumed to have a life cycle with varying
7   growth characteristics. Typically, the potential for extraordinary growth
8   in the near term eases over time and eventually growth slows to a more
9   stable level.

10   *   *   *

11   Another approach to estimating long-term growth rates is to focus on
12   estimating the overall economic growth rate. Again, this is the approach
13   used in the *Ibbotson Cost of Capital Yearbook*. To obtain the economic
14   growth rate, a forecast is made of the growth rate's component parts.
15   Expected growth can be broken into two main parts: expected inflation
16   and expected real growth. By analyzing these components separately, it
17   is easier to see the factors that drive growth.[11]

18   **Q   ARE THERE ANY ACTUAL INVESTMENT RESULTS THAT SUPPORT THE**

19   **NOTION THAT THE GROWTH IN STOCK INVESTMENTS WILL NOT**

20   **EXCEED THE NOMINAL GROWTH OF THE U.S. GDP?**

21   A   Yes. This is evident by a comparison of the compound annual growth of the U.S. GDP

22   compared to the geometric growth of the U.S. stock market. Duff & Phelps measures

23   the historical geometric growth of the U.S. stock market over the period 1926-2019 to

24   be approximately 6.1%.[12] During this same time period, the U.S. nominal compound

25   annual growth of the U.S. GDP was approximately 6.0%.[13]

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[11]*Morningstar, Inc., Ibbotson SBBI 2013 Valuation Yearbook* at 51 and 52.
[12]*Duff & Phelps, 2020 SBBI Yearbook* at 6-17.
[13]U.S. Bureau of Economic Analysis, January 28, 2021.

1   As such, over the past 90 years, the geometric average growth of the U.S.

2   nominal GDP has been higher but comparable to the average geometric growth of the

3   U.S. stock market capital appreciation. This historical relationship indicates that the

4   U.S. GDP growth outlook is a conservative estimate of the long-term sustainable growth

5   of U.S. stock investments.

6   **Q**   **WHAT IS THE GEOMETRIC AVERAGE AND WHY IS IT APPROPRIATE TO**

7   **USE THIS MEASURE TO COMPARE GDP GROWTH TO CAPITAL**

8   **APPRECIATION IN THE STOCK MARKET?**

9   A   The geometric average growth rate and compound annual growth rate are used

10   interchangeably. The geometric annual growth rate is the calculated growth rate, or

11   return, that measures the magnitude of growth from start to finish. The geometric

12   average is best, and most often, used as a measurement of performance or growth over

13   a long period of time.[14] Because I am comparing achieved growth in the stock market

14   to achieved growth in U.S. GDP over a long period of time, the geometric average

15   growth rate is most appropriate.

16 **Q**   **HOW DID YOU DETERMINE A LONG-TERM GROWTH RATE THAT**

17   **REFLECTS THE CURRENT CONSENSUS OF INDEPENDENT MARKET**

18   **PARTICIPANTS?**

19 A   I relied on the consensus of long-term GDP growth projections as projected by

20   independent economists. *Blue Chip Financial Forecasts* publishes the consensus for

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[14]*New Regulatory Finance*, Roger Morin, PhD, at 133-134.

1   GDP growth projections twice a year. These projections reflect current outlooks for

2   GDP and are likely to be influential on investors' expectations of future growth

3   outlooks. The consensus of projected GDP growth is about 4.35% over the next

4   10 years.[15]

5 **Q   DO YOU CONSIDER OTHER SOURCES OF PROJECTED LONG-TERM GDP**

6 **GROWTH?**

7 A   Yes, and these alternative sources corroborate the consensus analysts' projections I

8   relied on. Various commonly relied upon analysts' projections are shown in Table 7

9   below.

TABLE 7

GDP Forecasts

Source	Real GDP	Inflation	Nominal GDP
Blue Chip Financial Forecasts	2.3%	2.1%	4.3%
EIA - Annual Energy Outlook	1.8%	2.2%	4.1%
Congressional Budget Office	1.8%	2.0%	3.8%
Moody's Analytics	2.2%	1.8%	4.1%
Social Security Administration			4.1%
The Economist Intelligence Unit	1.8%	2.0%	3.9%

---

10   The EIA in its *Annual Energy Outlook* projects real GDP out until 2050. In its

11   2020 Annual Report, the EIA projects real GDP through 2050 to be 1.8% and a

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[15]*Blue Chip Financial Forecasts*, December 1, 2020, at 14.

1   long-term GDP price inflation projection of 2.2%. The EIA data supports a long-term

2   nominal GDP growth outlook of 4.1%.[16]

3   Also, the Congressional Budget Office ("CBO") makes long-term economic

4   projections. The CBO is projecting real GDP growth to be 1.8% during the next

5   nine years, with a GDP price inflation outlook of 2.0%. The CBO's nine-year outlook

6   for nominal GDP based on this projection is 3.8%.[17]

7   Moody's Analytics also makes long-term economic projections. In its recent

8   over 25-year outlook to 2048, Moody's Analytics is projecting real GDP growth of 2.2%

9   with GDP inflation of 1.8%.[18]   Based on these projections, Moody's Analytics is

10   projecting nominal GDP growth of 4.1% over the next 25 years.

11   The Social Security Administration ("SSA") makes long-term economic

12   projections out to 2095. The SSA's nominal GDP projection, under its "intermediate

13   cost" scenario of approximately 50 years, is 4.1%.[19]

14   The Economist Intelligence Unit, a division of The Economist and a third-party

15   data provider to MI, makes a long-term economic projection out to 2050.   The

16   Economist Intelligence Unit is projecting real GDP growth of 1.8% with an inflation

17   rate of 2.0% out to 2050. The real GDP growth projection is in line with the consensus.

18   The long-term nominal GDP projection based on these outlooks is approximately

19   3.9%.[20]

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[16]DOE/EIA Annual Energy Outlook 2020 With Projections to 2050, March 2020, Table Macroeconomic Indicators.
[17]*CBO: An Update to the Economic Outlook: 2020 to 2030*, July 2020.
[18]www.economy.com, *Moody's Analytics Forecast*, May 11, 2020.
[19]www.ssa.gov, "2020 OASDI Trustees Report," Table VI.G4, April 22, 2020.
[20]*S&P Global Market Intelligence, Economist Intelligence Unit*, downloaded on January 28, 2021.

1   The real GDP and nominal GDP growth projections made by these independent

2   sources support the use of the consensus for five-year and ten-year projected GDP

3   growth outlooks I use in my analysis as a reasonable estimate of market participants'

4   long-term GDP growth.

5 **Q**   **WHAT STOCK PRICE, DIVIDEND, AND GROWTH RATES DID YOU USE IN**

6   **YOUR MULTI-STAGE DCF ANALYSIS?**

7 A   I relied on the same 13-week and 26-week average stock prices and the most recent

8   quarterly dividend payment data discussed above. For the first stage, I used the

9   consensus of analysts' growth rate projections discussed above in my constant growth

10   DCF model. The first stage covers the first five years, consistent with the time horizon

11   of the securities analysts' growth rate projections. The second stage, or transition stage,

12   begins in year 6 and extends through year 10. The second stage growth transitions the

13   growth rate from the first stage to the third stage using a straight linear trend. For the

14   third stage, or long-term sustainable growth stage, starting in year 11, I used a 4.35%

15   long-term sustainable growth rate based on the consensus of economists' long-term

16   projected nominal GDP growth rate.

17 **Q**   **WHAT ARE THE RESULTS OF YOUR MULTI-STAGE DCF MODEL?**

18 A   As shown in Exhibit CCW-10, the average and median DCF ROEs for my proxy group

19   using the 13-week average stock price are 8.17% and 8.40%, respectively.

1 **Q   PLEASE SUMMARIZE THE RESULTS FROM YOUR DCF ANALYSES.**

2 A   The DCF results are summarized in Table 8 below. It is my opinion a reasonable ROE

3   based on the DCF results summarized in Table 8 is 9.1%.

TABLE 8

Summary of DCF Results

| | Proxy Group | |
Description	Average	Median
Constant Growth DCF Model (Analysts' Growth)	8.96%	9.26%
Constant Growth DCF Model (Sustainable Growth)	8.38%	8.27%
Multi-Stage DCF Model	8.17%	8.40%

4 **IV.G. Risk Premium Model**

5 **Q   PLEASE DESCRIBE YOUR BOND YIELD PLUS RISK PREMIUM MODEL.**

6 A   This model is based on the principle that investors require a higher return to assume

7   greater risk. Common equity investments have greater risk than bonds because bonds

8   have more security of payment in bankruptcy proceedings than common equity and the

9   coupon payments on bonds represent contractual obligations. In contrast, companies

10   are not required to pay dividends or guarantee returns on common equity investments.

11   Therefore, common equity securities are considered to be riskier than bond securities.

12   This risk premium model is based on two estimates of an equity risk premium.

13   First, I quantify the difference between regulatory commission-authorized returns on

14   common equity and contemporary U.S. Treasury bonds. The difference between the

15   authorized return on common equity and the Treasury bond yield is the risk premium.

1   I estimated the risk premium on an annual basis for each year since January 1986. The

2   authorized ROEs were based on regulatory commission-authorized returns for electric

3   utility companies. Authorized returns are typically based on expert witnesses' estimates

4   of the investor-required return at the time of the proceeding.

5   The second equity risk premium estimate is based on the difference between

6   regulatory commission-authorized returns on common equity and contemporary

7   "A" rated utility bond yields by Moody's. I selected the period 1986 through 2020

8   because public utility stocks consistently traded at a premium to book value during that

9   period. This is illustrated in Exhibit CCW-11, which shows the market-to-book ratio

10   since 1986 for the electric utility industry was consistently above a multiple of 1.0x.

11   Over this period, an analyst can infer that authorized ROEs were sufficient to support

12   market prices that at least exceeded book value. This is an indication that commission

13   authorized returns on common equity supported a utility's ability to issue additional

14   common stock without diluting existing shares. It further demonstrates that utilities

15   were able to access equity markets without a detrimental impact on current shareholders.

16   Based on this analysis, as shown in Exhibit CCW-12 the average indicated

17   equity risk premium over U.S. Treasury bond yields has been 5.65%. Since the risk

18   premium can vary depending upon market conditions and changing investor risk

19   perceptions, I believe using an estimated range of risk premiums provides the best

20   method to measure the current return on common equity for a risk premium

21   methodology.

22   I incorporated 5-year and 10-year rolling average risk premiums over the study

23   period to gauge the variability over time of risk premiums. These rolling average risk

1   premiums mitigate the impact of anomalous market conditions and skewed risk

2   premiums over an entire business cycle. As shown on my Exhibit CCW-12, the

3   five-year rolling average risk premium over Treasury bonds ranged from 4.25% to

4   7.02%, while the 10-year rolling average risk premium ranged from 4.38% to 6.80%.

5   As shown on my Exhibit CCW-13, the average indicated equity risk premium

6   over contemporary "A" rated Moody's utility bond yields was 4.28%. The five-year

7   and 10-year rolling average risk premiums ranged from 2.88% to 5.77% and 3.20% to

8   5.62%, respectively.

9   **Q**   **DO YOU BELIEVE THAT THE TIME PERIOD USED TO DERIVE THESE**

10   **EQUITY RISK PREMIUM ESTIMATES IS APPROPRIATE TO FORM**

11   **ACCURATE CONCLUSIONS ABOUT CONTEMPORARY MARKET**

12   **CONDITIONS?**

13 A   Yes. Contemporary market conditions can change dramatically during the period that

14   rates determined in this proceeding will be in effect. A relatively long period of time

15   where stock valuations reflect premiums to book value indicates that the authorized

16   ROEs and the corresponding equity risk premiums were supportive of investors' return

17   expectations and provided utilities access to the equity markets under reasonable terms

18   and conditions. Further, this time period is long enough to smooth abnormal market

19   movement that might distort equity risk premiums. While market conditions and risk

20   premiums do vary over time, this historical time period is a reasonable period to estimate

21   contemporary risk premiums.

1   Alternatively, some studies, such as Duff & Phelps referred to later in this

2   testimony, have recommended that use of "actual achieved investment return data" in a

3   risk premium study should be based on long historical time periods. The studies find

4   that achieved returns over short time periods may not reflect investors' expected returns

5   due to unexpected and abnormal stock price performance. Short-term, abnormal actual

6   returns would be smoothed over time and the achieved actual investment returns over

7   long time periods would approximate investors' expected returns. Therefore, it is

8   reasonable to assume that averages of annual achieved returns over long time periods

9   will generally converge on the investors' expected returns.

10   My risk premium study is based on data that inherently relied on investor

11   expectations, not actual investment returns, and, thus, need not encompass a very long

12   historical time period.

13   **Q   PLEASE EXPLAIN OTHER MARKET EVIDENCE YOU RELIED ON IN**

14   **DETERMINING AN APPROPRIATE EQUITY RISK PREMIUM.**

15   A   The equity risk premium should reflect the market's perception of risk in the utility

16   industry today. I have gauged investor perceptions in utility risk today in Exhibit

17   CCW-14, where I show the yield spread between utility bonds and Treasury bonds over

18   the last 40 years. As shown in this schedule, the average utility bond yield spreads over

19   Treasury bonds for "A" and "Baa" rated utility bonds for this historical period are 1.49%

20   and 1.93%, respectively. Yield spreads of "A" and "Baa" rated utility bonds over

21   Treasury bonds during 2018 were 1.14% and 1.56%, respectively, which are lower than

22   the 40-year averages. The yield spreads of "A" and "Baa" rated utility bonds over

1 Treasury bonds during 2019 were 1.18% and 1.61%, respectively. Most recently in

2 2020, the "A" and "Baa" utility spreads are 1.49% and 1.87%, respectively.

3 A current 13-week average "A" rated utility bond yield of 2.84% when

4 compared to the current Treasury bond yield of 1.69%, as shown in Exhibit CCW-15,

5 page 1, implies a yield spread of 1.15%. This current utility bond yield spread is lower

6 than the 40-year average spread for "A" rated utility bonds of 1.49%. The current spread

7 for the "Baa" rated utility bond yield of 1.44% is also lower than the 40-year average of

8 1.93%.

9 The 26-week average "A" rated utility bond yield of 2.84% when compared to

10 the 26-week average Treasury bond yield of 1.56%, as shown in Exhibit CCW-15,

11 page 2, implies a yield spread of 1.28%. This utility bond yield spread is lower than the

12 40-year average spread for "A" rated utility bonds of 1.49%. The spread for the 26-

13 week average "Baa" rated utility bond yield of 1.59% is also lower than the 40-year

14 average of 1.93%.

15 The 13-week average spreads are lower than both the 26-week averages and the

16 long-term averages. This indicates that the market has had higher demand for utility

17 bonds in recent weeks relative to longer periods of time. This is evidence that utilities

18 currently have ample access to capital at reasonable prices.

19 **Q** **WHAT IS YOUR RECOMMENDED RETURN FOR THE COMPANIES BASED**

20 **ON YOUR RISK PREMIUM STUDY?**

21 A Because of today's low interest rates and uncertainty revolving around forecasted

22 interest rates, I am recommending more weight be given to the high-end risk premium

1   estimates than the low-end, in order to be conservative. As such, I am recommending

2   that the most recent five-year average risk premium be used in determining a fair ROE

3   for the Companies. As shown on my Exhibit CCW-12, the most recent five-year

4   average risk premium over Treasury yields is 7.02%. A risk premium of 7.02% exceeds

5   the 35-year average of 5.65% by 1.37%. Adding the 7.02% risk premium to the

6   projected Treasury yield of 2.10% produces a ROE of 9.12%, rounded to 9.10%.

7   Similarly, as shown on my Exhibit CCW-13, the most recent five-year allowed

8   risk premium over utility bond yields is 5.77%. This risk premium is well above the

9   35-year historical average risk premium of 4.28%. The A-rated utility bond yield has

10   averaged 2.84% over both the 13-week and 26-week periods ending January 22, 2020,

11   respectively. Adding the 5.77% risk premium to the A-rated utility bond yields of

12   2.84% produce an estimated cost of equity of 8.61%. Similarly, the Baa-rated utility

13   bond yield has averaged 3.13% and 3.15% over the same 13-week and 26-week periods,

14   respectively. Adding the 5.77% risk premium to the average Baa-rated utility bond

15   yields of 3.13% and 3.15% produces an estimated cost of equity of approximately

16   8.90%. The estimated cost of equity using the risk premium over utility bond yields is

17   in the range of 8.6% to 8.9%. The results of my risk premium analyses are summarized

18   in Table 9. Based on these results, I conclude that a reasonable ROE based on my risk

19   premium analyses is 9.0%.

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TABLE 9

Summary of Risk Premium Results

Description	ROE Estimate
Projected Treasury Yield	9.10%
13-Week Average Yields	
A-Rated Utility Bond	8.6%
Baa-Rated Utility Bond	8.9%
26-Week Average Yields	
A-Rated Utility Bond	8.6%
Baa-Rated Utility Bond	8.9%

</div>

1 **IV.H. Capital Asset Pricing Model ("CAPM")**

2 **Q   PLEASE DESCRIBE THE CAPM.**

3 A   The CAPM method of analysis is based upon the theory that the market-required rate of

4   return for a security is equal to the risk-free rate, plus a risk premium associated with

5   the specific security. This relationship between risk and return can be expressed

6   mathematically as follows:

7              $R_i = R_f + B_i \times (R_m - R_f)$ where:

8   R_i =   Required return for stock i
9   R_f =   Risk-free rate
10   R_m =   Expected return for the market portfolio
11   B_i =   Beta - Measure of the risk for stock

12   The stock-specific risk term in the above equation is beta. Beta represents the

13   investment risk that cannot be diversified away when the security is held in a diversified

1   portfolio. When stocks are held in a diversified portfolio, stock-specific risks can be

2   eliminated by balancing the portfolio with securities that react in the opposite direction

3   to firm-specific risk factors (e.g., business cycle, competition, product mix, and

4   production limitations).

5   The risks that cannot be eliminated when held in a diversified portfolio are

6   non-diversifiable risks. Non-diversifiable risks are related to the market in general and

7   referred to as systematic risks. Risks that can be eliminated by diversification are

8   non-systematic risks.   In a broad sense, systematic risks are market risks and

9   non-systematic risks are business risks. The CAPM theory suggests the market will not

10   compensate investors for assuming risks that can be diversified away. Therefore, the

11   only risk investors will be compensated for are systematic, or non-diversifiable, risks.

12   The beta is a measure of the systematic, or non-diversifiable risks.

13   **Q   PLEASE DESCRIBE THE INPUTS TO YOUR CAPM.**

14   A   The CAPM requires an estimate of the market risk-free rate, the Company's beta, and

15   the market risk premium.

16   **Q   WHAT DID YOU USE AS AN ESTIMATE OF THE MARKET RISK-FREE**

17   **RATE?**

18   A   As previously noted, *Blue Chip Financial Forecasts*' projected 30-year Treasury bond

19   yield is 2.1%.[21] The current 30-year Treasury bond yield is 1.69%, as shown in Exhibit

20   CCW-15 at page 1. Again, in an effort to provide a conservative ROE estimate, I used

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[21]*Blue Chip Financial Forecasts*, January 1, 2021 at 2.

1   *Blue Chip Financial Forecasts*' projected 30-year Treasury bond yield of 2.1% for my

2   CAPM analysis.

3   **Q   WHY DID YOU USE LONG-TERM TREASURY BOND YIELDS AS AN**

4   **ESTIMATE OF THE RISK-FREE RATE?**

5   A   Treasury securities are backed by the full faith and credit of the United States

6   government, so long-term Treasury bonds are considered to have negligible credit risk.

7   Also, long-term Treasury bonds have an investment horizon similar to that of common

8   stock. As a result, investor-anticipated long-run inflation expectations are reflected in

9   both common stock required returns and long-term bond yields. Therefore, the nominal

10   risk-free rate (or expected inflation rate and real risk-free rate) included in a long-term

11   bond yield is a reasonable estimate of the nominal risk-free rate included in common

12   stock returns.

13   Treasury bond yields, however, do include risk premiums related to

14   unanticipated future inflation and interest rates. In this regard, a Treasury bond yield is

15   not entirely risk-free. Risk premiums related to unanticipated inflation and interest rates

16   reflect systematic market risks. Consequently, for companies with betas less than 1.0,

17   using the Treasury bond yield as a proxy for the risk-free rate in the CAPM analysis can

18   produce an overstated estimate of the CAPM return.

19   **Q   WHAT BETA DID YOU USE IN YOUR ANALYSIS?**

20   A   As shown in Exhibit CCW-16, the proxy group average and median *Value Line* beta

21   estimates are both 0.88. In my experience, these beta estimates are abnormally high and

1   are unlikely to be sustained over the long-term. As such, I have also reviewed the

2   historical average of the proxy group's *Value Line* betas. The historical average *Value*

3   *Line* beta since 2014 is 0.66 and has ranged from 0.54 to 0.87. In addition to Value

4   Line, I have also included adjusted beta estimates as provided by Market Intelligence's

5   Beta Generator model. The model relied on a five-year period on a weekly basis ending

6   January 22, 2021. Unlike the Value Line betas, the Market Intelligence betas were

7   calculated using the S&P 500 as the benchmark for the market, and adjusted using the

8   Vasicek method. The average and median Market Intelligence betas are 0.65 and 0.66,

9   respectively.

10   **Q   HOW DID YOU DERIVE YOUR MARKET RISK PREMIUM ESTIMATE?**

11   A   I derived three market risk premium estimates: a forward-looking estimate using a risk

12   premium methodology and two forward-looking estimates based on the DCF

13   methodology.

14   **Q   PLEASE DESCRIBE YOUR MARKET RISK PREMIUM ESTIMATE**

15   **DERIVED USING THE RISK PREMIUM METHODOLOGY.**

16   A   The forward-looking risk premium-based estimate was derived by estimating the

17   expected return on the market (as represented by the S&P 500) and subtracting the risk-

18   free rate from this estimate. I estimated the expected return on the S&P 500 by adding

19   an expected inflation rate to the long-term historical arithmetic average real return on

20   the market. The real return on the market represents the achieved return above the rate

21   of inflation.

1   Duff & Phelps' *2020 SBBI Yearbook* estimates the historical arithmetic average

2   real market return over the period 1926 to 2019 to be 9.0%.[22] A current consensus for

3   projected inflation, as measured by the Consumer Price Index ("CPI"), is 2.0%.[23] Using

4   these estimates, the expected market return is 11.2%.[24] The market risk premium then

5   is the difference between the 11.2% expected market return and the projected risk-free

6   rate of 2.1%, or 9.1%.

7 **Q   PLEASE DESCRIBE YOUR MARKET RISK PREMIUM ESTIMATES**

8   **DERIVED USING THE DCF METHODOLOGY.**

9 A I employed two versions of the constant growth DCF model to develop estimates of the

10   market risk premium. I first employed the constant growth DCF model in the traditional

11   sense by adding a projected 3-5 year growth rate to a projected dividend yield.

12   I obtained the expected growth rate of the S&P 500 Index from State Street

13   Global Advisors ("State Street"). State Street is the creator of several exchange traded

14   funds ("ETF") that cover a multitude of investment strategies. In general, ETFs can be

15   expected to move up or down in value with the value of the applicable index. For

16   example, the SPDR S&P 500 ETF (Ticker: SPY) is designed to correspond generally to

17   the price and yield performance of the S&P 500 Index.

18   On its website, State Street publishes a multitude of comparative data for its SPY

19   ETF and the S&P 500 Index, including the current dividend yield and 3-5 year earnings

20   growth rates. As inputs to my first constant growth DCF analysis, I have relied on the

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[22]*Duff & Phelps, 2020 SBBI Yearbook at 6-18.*
[23]*Blue Chip Financial Forecasts*, January 1, 2021 at 2.
[24]{ [(1 + 0.090) * (1 + 0.02)] − 1 } * 100.

1   published dividend yield and growth rate estimates for the S&P 500 Index as published

2   by State Street on February 1, 2021. The published dividend yield and estimated growth

3   for the S&P 500 as of February 1, 2021 were 1.53% and 12.83%, respectively. Using

4   these inputs, a constant growth DCF produces an expected return on the market of

5   14.56%.[25] Subtracting the projected Treasury yield of 2.10% from the expected return

6   on the market of 14.56% produces a market risk premium estimate of 12.50%.

7   My second DCF-based market risk premium estimate was derived by estimating

8   the expected market return using a version of the FERC's two-step DCF methodology.

9   FERC's two-step DCF analysis is a constant growth DCF using a growth rate that is

10   calculated by weighting the 3-5 year growth rate estimate by 80% and the projected

11   long-term GDP growth rate by 20%. Applying 80% weight to the S&P 500 growth

12   estimate of 12.83%, and 20% weight to the GDP growth rate estimate of 4.35%

13   discussed above, produces a blended growth rate of 11.13%.[26]

14   I then used the blended growth rate of 11.13% and the current dividend yield of

15   1.53% to estimate the expected market return by employing the constant growth DCF.

16   This yields an expected market return of 12.83%.[27] Subtracting the projected risk-free

17   rate of 2.10% from this expected market return produces a market risk premium of

18   approximately 10.70%.

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[25]DCF = 1.53%*(1+12.83%) + 12.83% = 14.56%.
[26](12.83%*0.80) + (4.35%*0.20) = 11.13%.
[27]Two-Step DCF = 1.53%*(1+11.13%) + 11.13% = 12.83%.

1   Q   **PLEASE EXPLAIN WHY YOU EMPLOYED THE TWO-STEP DCF METHOD.**

2   A   As I discussed in detail above, the constant growth model assumes the input growth rate

3   to be the growth rate in perpetuity. No company, regulated or not, can grow at a higher

4   rate than the economy in which it sells goods and services in perpetuity, which is the

5   time period assumed in the DCF model. Because the actual earnings estimates for the

6   underlying holdings are used to calculate a mean 3-5 year earnings growth rate estimate

7   for the index, the individual growth rates for the underlying holdings must be taken into

8   consideration in evaluating the reasonableness, or sustainability, of the growth rate for

9   the index as a whole. For example, S&P 500 member Company Amazon, Inc., (NYSE:

10   AMZN) has a consensus projected growth rate of 38.5% as reported by Yahoo! Finance.

11   This growth rate nearly 9.0x greater than the consensus expected growth rate of 4.35%

12   for the U.S. economy discussed earlier.

13   For these reasons, employing the two-step DCF based on a blended growth rate

14   that gives some weight to projected GDP growth is reasonable.

15   Q   **HOW DO YOUR FORWARD-LOOKING ESTIMATES OF THE MARKET**

16   **RISK PREMIUM COMPARE TO THE HISTORICAL REALIZED MARKET**

17   **RISK PREMIUM?**

18   A   Between 1926 and 2019, the arithmetic average of the achieved total return on the S&P

19   500 was 12.1%[28] and the return on long-term Treasury bonds was 6.0%.[29] The indicated

20   market risk premium is 6.1% (12.1% - 6.0% = 6.1%). Therefore, my forward-looking

---

[28]*Duff & Phelps, 2020 Yearbook at 6-17.*
[29]*Id.*

1   estimates of the market risk premium of 9.1%, 10.7%, and 12.5% exceed the historical

2   market risk premium by 3.0% to 6.40%.

3   **Q**   **HOW DO YOUR EXPECTED MARKET RETURNS COMPARE TO CURRENT**

4   **EXPECTATIONS OF FINANCIAL INSTITUTIONS?**

5   A   As shown in Table 10, my expected market returns of 11.18%, 12.83%, and 14.56%

6   exceed long-term market expectations of several financial institutions.

TABLE 10

Long-Term Expected Return on the Market

| | | Expected Return | |
| | | Large Cap | Nominal |
Source	Term	Equities	US GDP
BlackRock Capital Management[1]	25 Years	7.10%	N/A
JP Morgan Chase[2]	10 - 15 Years	4.10%	3.84%
Vanguard[3]	10 Years	3.7% - 5.7%	N/A
Research Affiliates[4]	10 Years	1.99%	3.72%
Morningstar[5]	10 Years	-0.10%	N/A

Sources:
[1]BlackRock Investment Institute, February 2021 report, downloaded 3/1/21.
[2]JP Morgan Chase, Long-Term Capital Market Assumptions, 2021 Report.
[3]Vanguard economic and market outlook for 2021: Approaching the dawn, December 2020.
[4]Research Affiliates, Asset Allocation Interactive, downloaded 3/1/2021.
[5]Morningstar Markets Observer Q1 2021 at 12.

1   When compared to the expected market returns of financial institutions above,

2   my average expected market return of 12.86% is more than two times higher than all

3   but one projection. For these reasons, my expected market returns, and the associated

4   market risk premiums, should be considered high-end estimates.

5 **Q** **HOW DO YOUR ESTIMATED MARKET RISK PREMIUMS COMPARE TO**

6   **THAT ESTIMATED BY DUFF & PHELPS?**

7 **A**   The Duff & Phelps analysis indicates a market risk premium falls somewhere in the

8   range of 5.5% to 7.15%. My market risk premium estimates are in the range of 9.1% to

9   12.5%. All of my market risk premium estimates are substantially above the historical

10   and normalized market risk premiums recommended by Duff & Phelps.

11 **Q** **HOW DOES DUFF & PHELPS MEASURE A MARKET RISK PREMIUM?**

12 **A**   Duff & Phelps makes several estimates of a forward-looking market risk premium based

13   on actual achieved data from the historical period of 1926 through 2019 as well as

14   normalized data. Using this data, Duff & Phelps estimates a market risk premium

15   derived from the total return on large company stocks (S&P 500), less the income return

16   on Treasury bonds.

17   Duff & Phelps' range is based on several methodologies. First, Duff & Phelps

18   estimates a market risk premium of 7.15% based on the difference between the total

19   market return on common stocks (S&P 500) less the income return on 20-year Treasury

20   bond investments over the 1926-2019 period.[30]

---

[30]*Duff & Phelps 2020 SBBI Yearbook* at 10-21.

1   Second, Duff & Phelps used the Ibbotson & Chen supply-side model which

2   produced a market risk premium estimate of 6.17%.[31] Duff & Phelps explains that the

3   historical market risk premium based on the S&P 500 was influenced by an abnormal

4   expansion of P/E ratios relative to earnings and dividend growth during the period,

5   primarily over the last 30 years. In order to control for the volatility of extraordinary

6   events and their impacts on P/E ratios, Duff & Phelps takes into consideration the

7   three-year average P/E ratio as the current P/E ratio. Therefore, Duff & Phelps adjusted

8   this market risk premium estimate to normalize the growth in the P/E ratio to be more

9   in line with the growth in dividends and earnings.

10   Finally, Duff & Phelps develops its own recommended equity, or market risk

11   premium by employing an analysis that takes into consideration a wide range of

12   economic information, multiple risk premium estimation methodologies, and the current

13   state of the economy by observing measures such as the level of stock indices and

14   corporate spreads as indicators of perceived risk. Based on this methodology, and

15   utilizing a "normalized" risk-free rate of 2.5%, Duff & Phelps concludes that the current

16   expected, or forward-looking, market risk premium is 5.5%, implying an expected

17   return on the market of 9.0%.[32]

18   It should be noted that Duff & Phelps' market risk premiums are measured over

19   a 20-year Treasury bond. Because I am relying on a projected 30-year Treasury bond

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[31]*Id.* at 10-29.
[32]*Duff & Phelps*: "Technical Update: Duff & Phelps Recommended U.S. Equity Risk Premium Decreased from 6.0% to 5.5%," December 10, 2020.

1   yield, the results of my CAPM analysis should be considered conservative estimates for

2   the cost of equity.

3 **Q**   **WHAT ARE THE RESULTS OF YOUR CAPM ANALYSIS?**

4 A   As shown in Exhibit CCW-17, I have provided the results of nine different applications

5   of the CAPM. The first three results presented are based on the proxy group's current

6   average Value Line beta of 0.88, a projected risk-free rate of 2.10%, and my three

7   market risk premium estimates of 9.1%, 10.7%, and 12.5%. The results of the CAPM

8   based on these inputs range from 10.14% to 13.14%.

9   The next three results presented are based on the proxy group's historical Value

10   Line beta of 0.66, a projected risk-free rate of 2.1%, and my three market risk premium

11   estimates of 9.1%, 10.7%, and 12.5%. The results of the CAPM based on these inputs

12   range from 8.14% to 10.40%.

13   The last three results presented are based on the proxy group's current S&P

14   Global Market Intelligence beta of 0.65, a projected risk-free rate of 2.10%, and my

15   three market risk premium estimates of 9.1%, 10.7%, and 12.5%. The results of the

16   CAPM based on these inputs range from 8.03% to 10.24%. My CAPM results are

17   summarized in Table 11.

18   Based on these results, I conclude that a reasonable CAPM estimate is 9.6%.

TABLE 11

CAPM Results Summary

Description	Current VL Beta	Historical VL Beta	Current S&P GMI Beta
Risk Premium Method	10.14%	8.14%	8.03%
FERC 2-Step DCF Method	11.55%	9.20%	9.07%
Constant Growth DCF Method	13.14%	10.40%	10.24%

---

1 **IV.I. Return on Equity Summary**

2 **Q**   **BASED ON THE RESULTS OF YOUR RETURN ON COMMON EQUITY**

3   **ANALYSES DESCRIBED ABOVE, WHAT RETURN ON COMMON EQUITY**

4   **DO YOU RECOMMEND FOR THE COMPANIES?**

5 A   The results of my analyses are summarized in Table 12.

<div align="center">

TABLE 12

Return on Common Equity Summary

Description	Results
DCF	9.1%
Risk Premium	9.0%
CAPM	9.6%

</div>

1   Based on my analyses described above, I estimate the Companies' current

2   market cost of equity to be in the reasonable range of 9.0% to 9.6% with a midpoint

3   estimate of 9.3%.

4   **V. RESPONSE MR. ADRIEN MCKENZIE**

5   **V.A. Summary of Rebuttal**

6 **Q**   **WHAT ROE ARE THE COMPANIES REQUESTING?**

7 A   Mr. McKenzie's recommendation of 10.00% is the midpoint of his flotation-cost

8   adjusted range of 9.4% to 10.6%.[33] To arrive at his adjusted range, Mr. McKenzie

9   included a 0.10% upward adjustment to account for flotation costs. Mr. McKenzie's

10   recommended range and the Companies' request are unreasonable and should be

11   rejected.

---

[33]McKenzie Direct Testimony at 3-4.

1   **V.B. Return on Equity**

2   **Q   HOW DID MR. MCKENZIE DEVELOP HIS ROE RANGE?**

3   A   Mr. McKenzie developed his ROE recommendation based on the results of his DCF,

4   traditional CAPM, Empirical CAPM ("ECAPM"), and a Risk Premium model. He

5   relies on the results of an Expected Earnings analysis and a non-utility DCF analysis as

6   an attempt to corroborate his results.

7   As shown below in Table 13, I provide the average results of Mr. McKenzie's

8   analyses which he relies on to conclude that a ROE in the range of 9.4% to 10.6%, with

9   a midpoint of 10.0%, is reasonable for the Companies.   However, reasonable

10   adjustments to Mr. McKenzie's analyses reduce his ROE estimate for the Companies to

11   no higher than my recommended ROE of 9.3%.

TABLE 13

Mr. McKenzie's ROE Analysis

Model	Average	Corrected
	(1)	(2)
DCF	8.8% - 9.2%	9.0%
CAPM	10.7%	8.8% - 9.1%
ECAPM	11.0%	Reject
Risk Premium		
Current Yield	9.3%	9.0% - 9.3%
Projected Yield	10.2%	Reject%
Expected Earnings	10.4% - 10.9%	Reject
Range	**9.3% - 10.5%**	
Flotation Cost Adj.	0.10%	Reject
Adjusted Range	9.4% - 10.6%	
Recommended ROE	**10.0%**	**9.3%**

_____
Source: Exhibit No. 2.

1   **V.C. DCF**

2   **Q   PLEASE DESCRIBE MR. MCKENZIE'S DCF ANALYSIS.**

3   A   Mr. McKenzie applied the traditional DCF model to his utility proxy group. Mr.

4   McKenzie observed the average and midpoint results of his proxy group's DCF results

5   after excluding what he determined to be outliers. The average DCF results fall in the

1   range of 8.3% to 9.2%. The midpoint DCF results fall in the range of 8.9% to 10.2%

2   for his proxy group.

3   In developing his recommended DCF range, Mr. McKenzie excluded what he

4   found to be outlier results. Mr. McKenzie removed 6 low-end outliers and zero high-end

5   outliers from his DCF results for his proxy group.[34]

6 **Q**   **CAN MR. MCKENZIE'S DCF ANALYSIS BE ADJUSTED TO PRODUCE**

7   **MORE REASONABLE RESULTS?**

8 **A**   Yes. Mr. McKenzie's proposal to selectively remove what he believes to be low-end

9   and high-end outliers from the proxy group has the effect of manipulating the results of

10   the proxy group study. Mr. McKenzie simply narrows the range of the proxy group

11   results to produce a result which he finds to be reasonable. This is hardly an independent

12   assessment of what the current market cost of equity is for the Companies.

13   A better methodology would be to rely on all the results of the proxy group, by

14   assessing the central tendency of the proxy group results. In the presence of outliers, a

15   more accurate method of measuring the central tendency of the proxy group's results

16   would be to measure the median of all the DCF return estimates. Relying on the

17   midpoint as Mr. McKenzie has done is not a well-accepted method of measuring the

18   central tendency to my knowledge. The midpoint methodology employed by Mr.

19   McKenzie ignores all but two results, the highest and the lowest. The median DCF

20   results for his proxy group is no higher than 9.0%. Mr. McKenzie's lopsided outlier

21   test clearly biases the results of his analyses upwards and should be rejected. This bias

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[34]Exhibit No. 4, page 3.

1   is exacerbated with the use of his midpoint methodology. As such, they should be both

2   be rejected and the median results should be relied on.

3   **V.D. Traditional CAPM**

4 **Q**   **PLEASE DESCRIBE MR. MCKENZIE'S TRADITIONAL CAPM ANALYSES.**

5 A   Mr. McKenzie developed a traditional CAPM analysis based on current Treasury bond

6   yields. His current bond yield of 1.40% is measured as the six-month average for the

7   period ending September 2020. Mr. McKenzie estimates a market return of 11.6%.

8   From this market return estimate, he subtracts his current risk-free rate of 1.4% to arrive

9   at a current market risk premium of 10.2%.[35] He relies on the *Value Line* utility betas

10   for the companies included in his proxy group to produce an average cost of equity of

11   10.2% for his proxy group.[36] Then he adjusts each of his CAPM return estimates to

12   account for any size premium based on each company's market capitalization. This size

13   adjustment has increased his proxy group's CAPM returns by approximately 50 basis

14   points (0.50%). Therefore, his size-adjusted traditional CAPM analysis produces an

15   average result of 10.7%.

16 **Q**   **IS MR. MCKENZIE'S CAPM ANALYSIS REASONABLE?**

17 A   No. I have several concerns with Mr. McKenzie's CAPM analysis. In short, Mr.

18   McKenzie's CAPM analysis is overstated for at least three reasons: (1) his expected

19   return on the market of 11.6% is based on an unsustainable growth rate, causing a bias

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[35]Exhibit No. 6.
[36]*Id.*

1   and does not include any consideration of the long-run average return on the market;

2   (2) his sole reliance on Value Line betas is at odds with his use of the S&P 500 as the

3   benchmark for the overall market; and (3) his size adjustment is not reasonable.

4 **Q   WHY DO YOU BELIEVE MR. MCKENZIE'S EXPECTED RETURN ON THE**

5   **MARKET IS UNREASONABLE?**

6 A   Mr. McKenzie's expected return on the market of 11.6% is based on a dividend yield

7   of 2.3% and an expected growth rate of 9.2%. The expected growth rate of 9.2%

8   incorporated in his expected market return is more than twice the expected growth rate

9   of the economy of 4.35%.

10   Mr. McKenzie obtained growth rates for the dividend paying S&P

11   500 companies from three sources including Zacks, Value Line, and IBES. He uses

12   these growth rates to perform three DCF analyses on the market. The growth rates Mr.

13   McKenzie relies on include numbers that do not make logical sense from an economic

14   perspective. For example, Mr. McKenzie's expected growth of the market of 9.2%

15   included companies with expected growth rates more than 4.5x higher than that of the

16   overall economy. As I explained in greater detail above, growth rates of this magnitude

17   cannot be reasonably expected to continue into perpetuity, which is the time period for

18   which the DCF is based on. Because of the abnormally high growth rates assumed in

19   his DCF for the return on the market, Mr. McKenzie should have implemented

20   alternative measures of the expected market return and market risk premium. As such,

21   Mr. McKenzie should have incorporated other measures of the expected return on the

22   market. As Dr. Morin notes in his book, *New Regulatory Finance,*

1   Although realized returns for a particular time period can deviate
2   substantially from what was expected, it is reasonable to believe that
3   long-run average realized returns provide an unbiased estimate of what
4   were expected returns. This is the fundamental rationale behind the
5   historical risk premium approach. Analysts and regulators often assume
6   that the average historical risk premium over long periods is the best
7   proxy for the future risk premium.[37]

8   Dr. Morin concludes that "[t]here are two broad approaches to estimating the

9   risk premium: retrospective and prospective. Each has its own strengths and

10 weaknesses, hence the need to utilize both methods."[38] As such, Mr. McKenzie should

11 have considered the results of multiple estimates of the expected market return from

12 multiple methods.

13 **Q   WHY DO YOU FIND MR. MCKENZIE'S SOLE RELIANCE ON VALUE LINE**

14 **BETAS IN HIS CAPM ANALYSIS TO BE INAPPROPRIATE?**

15 A   As I explain above, my CAPM analysis relies on beta estimates from Value Line and

16 S&P Global Market Intelligence's Beta Generator model. There are two distinct

17 differences between the MI Beta I relied on and the Value Line Beta: (1) the benchmark

18 index used as the proxy for the market in the MI Beta estimates is the S&P 500 whereas

19 Value Line relies on the New York Stock Exchange ("NYSE"); and (2) the MI Betas I

20 used are adjusted using the Vasicek method whereas the Value Line Betas are adjusted

21 using a modified form of the Blume adjustment.

22   Because Mr. McKenzie is not presenting a CAPM analysis that relies on the

23 NYSE as a proxy for the market, or the expected market return, which the MRP is

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[37]Morin, Dr. Roger A, "New Regulatory Finance," at p. 156.
[38]*Id.* at p. 162.

1   calculated from, this alone makes the Value Line Betas less preferable. Betas employed

2   in a CAPM should be calculated using the benchmark index that is also used as a proxy

3   for the overall market. Mr. McKenzie and I both relied on the S&P 500 as the proxy

4   for the overall market in estimating our MRP. While Value Line Betas are commonly

5   used in CAPM analyses presented in regulatory proceedings such as this one, it is

6   theoretically incorrect to do so unless the NYSE is used as the proxy for the overall

7   market used to calculate the MRP.

8 **Q** **WHY DO YOU FIND MR. MCKENZIE'S SIZE ADJUSTMENT**

9   **INAPPROPRIATE?**

10 **A** Mr. McKenzie's size adjustment ROE adder is based on estimates made by Duff &

11   Phelps's Cost of Capital Navigator. Duff & Phelps estimates various size adjustments

12   based on differentials in beta estimates tied to the size of a company. The main concern

13   with these size adjustments as applied by Mr. McKenzie, is that they are not based on

14   risk comparable companies relative to the utility industry or the Companies.

15 **Q** **WHY IS MR. MCKENZIE'S SIZE ADJUSTMENT TO HIS CAPM RETURN**

16   **NOT RISK COMPARABLE TO THE COMPANIES?**

17 **A** His size adjustment is based on companies that have significantly more systematic risks

18   that are not reflective of the utility industry, his proxy group, or the Companies. The

19   size adjustments relied on by Mr. McKenzie reflects companies that have unadjusted

1   beta estimates well in excess of 1.00.[39] I have provided the beta estimates, as calculated

2   by Duff & Phelps for each decile below in Table 14.

TABLE 14

Duff & Phelps Size Adjustments and Corresponding Betas[1]
(Dollars in Millions)

Market Capitalization	Size Premium	Beta		
		D&P OLS	**VL Proxy**	**OLS Proxy**[a]
$ 31,090	-0.28%	0.92	0.87	0.77
$ 13,143	0.50%	1.04	0.87	0.77
$ 6,619	0.73%	1.11	0.87	0.77
$ 4,313	0.79%	1.13	0.87	0.77
$ 2,689	1.10%	1.17	0.87	0.77
$ 1,670	1.34%	1.17	0.87	0.77
$ 994	1.47%	1.25	0.87	0.77
$ 516	1.59%	1.3	0.87	0.77
$ 230	2.22%	1.33	0.87	0.77
$ 2	4.99%	1.39	0.87	0.77

Source and Note

[1]Duff & Phelps, *2020 CRSP Deciles Size Study -- Supplementary Data Exhibits*, Cost of Capital Navigator.

[a]OLS Proxy (Raw) Beta = VL Proxy - 0.35) / 0.67

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3   These unadjusted beta estimates are substantially higher than the average

4   <u>adjusted</u> beta of 0.87 for the utility group used by Mr. McKenzie as comparable risk

5   proxy of the Companies' investment risk. To put this into a more of an apple-to-apples

---

[39]*Duff & Phelps Cost of Capital Navigator 2019, CRSP Deciles Size Study*.

1   comparison, I have also provided the average unadjusted OLS beta for Mr. McKenzie's

2   proxy group (0.77). As shown above, every decile measured by Duff & Phelps has a

3   much higher OLS beta than Mr. McKenzie's utility group. The typical company in each

4   decile is much riskier than the typical utility company Mr. McKenzie relied on as a

5   proxy of comparable risk to the Companies. Because of this significant disparity in risk,

6   as measured by beta, Mr. McKenzie's size adjustment produces a CAPM return estimate

7   that does not produce a risk appropriate return for the Companies and therefore, is not

8   a reasonable and fair return for the Companies.

9 **Q**   **CAN YOU EXPLAIN HOW BETA CORRESPONDS WITH THE LEVEL OF**

10   **INVESTMENT RISK FOR A COMPANY AND THEREFORE PRODUCES AN**

11   **APPROPRIATE RISK-ADJUSTED RETURN FOR A SUBJECT COMPANY?**

12 A   Yes. Beta represents a measure of systematic or non-diversifiable, market-related risk.

13   All of his proxy company betas are measured relative to that of the overall market

14   (proxied by the NYSE) and adjusted upward by *Value Line*. The market beta is

15   considered to be 1.0. For companies that have betas greater than 1, they are regarded

16   as having more risk than the overall market. For companies that have betas less than 1,

17   they are regarded to have risk less than the overall market.

18 **Q**   **CAN MR. MCKENZIE'S CAPM ANALYSIS BE ADJUSTED TO PRODUCE**

19   **MORE REASONABLE RESULTS?**

20 A   Yes. Multiple corrections are required. Such corrections are (1) include an expected

21   return on the market that is based in part on the long-run average realized return;

1   (2) eliminating his size adjustments; (3) incorporating beta estimates that are calculated

2   relative to the S&P 500 such as those presented in my CAPM analysis; and, (4)

3   removing Algonquin Power from the proxy group. Correcting Mr. McKenzie's CAPM

4   for the material flaws in his analysis would produce a reasonable return on equity within

5   the range of 8.8% to 9.1%.

6   **V.E. Empirical CAPM**

7   **Q   DID MR. MCKENZIE ALSO PERFORM AN ECAPM ANALYSIS?**

8   A   Yes. Mr. McKenzie performed an ECAPM analysis that relied on the same market risk

9   premium of 10.2%, the same risk-free rate of 1.4%, and the same average *Value Line*

10   beta that he used in his traditional CAPM analyses.

11   He then uses an ECAPM model that applies a 25% weighting factor to the

12   market beta of 1, and a 75% weighting factor to the utility group beta. This produces

13   an average ECAPM range of 10.5% for his utility group.

14   Finally, Mr. McKenzie applied a size adjustment of approximately 0.5% to his

15   utility group's ECAPM estimates. His size-adjusted average is 11.0%.[40]

16   **Q   ARE MR. MCKENZIE'S CURRENT AND PROJECTED ECAPM ANALYSES**

17   **REASONABLE?**

18   A   No. Mr. McKenzie's ECAPM analyses share all of the same flaws as his traditional

19   CAPM analyses. More importantly, Mr. McKenzie's proposal to apply an ECAPM

20   while using adjusted betas published by Value Line, as well as the long-term risk-free

---

[40]Exhibit No. 7.

1   rate further inflates his results. Mr. McKenzie's analysis and results should be

2   disregarded.

3 **Q   PLEASE EXPLAIN THE ISSUES YOU HAVE WITH MR. MCKENZIE'S**

4 **CURRENT AND PROJECTED ECAPM ANALYSES.**

5 A   Mr. McKenzie's ECAPM analysis is flawed because his model was developed using

6   adjusted utility betas. An ECAPM analysis flattens the security market line, and is

7   designed for raw beta estimates, not adjusted betas such as the ones published by *Value*

8   *Line*. Beta adjustments, on their own, accomplish virtually the same thing as an

9   ECAPM analysis. They flatten the security market line, and increase the intercept at

10   the risk-free rate. ECAPM analysis is not designed to be used with adjusted betas, but

11   rather is designed to be used with unadjusted betas. Mr. McKenzie's proposal to use

12   adjusted betas within an ECAPM analysis is unreasonable and double counts the attempt

13   to flatten the security market line and increase CAPM return estimates for companies

14   with betas below 1, and decrease CAPM return estimates for companies with betas

15   greater than 1.

16 **Q   DO YOU HAVE ANY ADDITIONAL COMMENTS REGARDING THE ECAPM**

17 **AND ADJUSTED BETAS?**

18 A   Yes. The notion that an adjustment to beta is only a horizontal axis adjustment is not

19   true. The *Value Line* beta adjustment alters the CAPM return at both the vertical axis

20   (the intercept point) and the horizontal axis, the slope of the CAPM return line (along

21   the horizontal axis). This is depicted in Figure 4 below.

1   As shown in Figure 4, I have modeled the expected returns at various levels of

2   raw beta using both the traditional CAPM and ECAPM methodologies assuming a

3   risk-free rate of 3.50%, and a market risk premium of 7.50%. I also show the expected

4   CAPM and ECAPM returns using the associated adjusted (*Value Line*) beta estimates

5   for each raw beta estimate. As shown in Figure 4 below, the impact on the traditional

6   CAPM return using a raw beta and a traditional CAPM using an adjusted beta has the

7   effect of increasing the intercept point at a zero raw beta (y axis) from: (1) risk-free rate

8   to (2) the combination of the risk-free rate plus 35% of the market risk premium.

9   Further, as the unadjusted beta is increased above zero, the adjusted beta increases the

10   CAPM return when the raw beta is less than one, and decreases the CAPM return when

11   the raw beta is greater than one. In other words, the beta adjustment raises the CAPM

12   return at the vertical axis point and flattens the security market across the horizontal axis

13   as the raw beta increases above zero.

14   The ECAPM using raw betas has the same impact on the traditional CAPM

15   using an adjusted beta: the ECAPM increases the CAPM return at a zero raw beta from:

16   (1) the risk-free rate, to (2) the risk-free rate plus 25% of the market risk premium.

17   Further, the ECAPM using raw betas flattens the traditional CAPM return line across

18   the horizontal axis as the raw betas increase above zero.

Figure 4

Variations of the CAPM
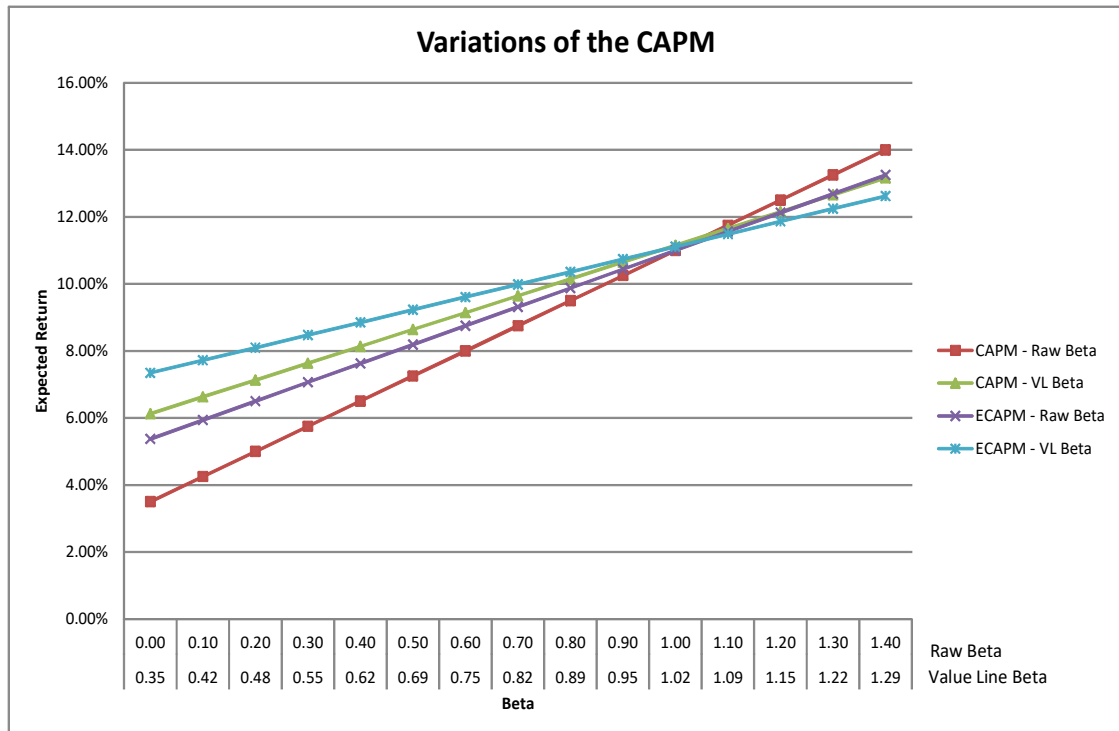
Assumptions:
Market Risk Premium is 7.50%
Risk-Free Rate is 3.50%

1   As shown in the graph above, compared to the traditional CAPM using a raw

2   beta, the traditional CAPM using an adjusted beta raises the intercept point (a y axis

3   impact) and flattens the slope of the security market line (an x axis impact). Similarly,

4   using a raw beta estimate, the ECAPM raises the intercept point at the y axis and flattens

5   the CAPM return for all raw beta estimates.

6   Significantly, if an adjusted beta is used in an ECAPM return model, the CAPM

7   return at the y axis increases from: (1) the risk-free rate, up to (2) the risk-free rate plus

8   approximately 51% of the market risk premium. Further, the CAPM return for betas

9   less than one starts at an inflated y axis intercept point and increases as the raw beta

10   increases above zero.

1   Mathematically, *Value Line*'s beta adjustments produce nearly the same effect

2   on the estimated CAPM return as does an ECAPM using a raw beta. Using an adjusted

3   beta in an ECAPM model, as Mr. McKenzie has proposed, produces a flawed and

4   inflated CAPM return estimate.

5   **V.F. Utility Risk Premium**

6   **Q   PLEASE DESCRIBE MR. MCKENZIE'S UTILITY EQUITY RISK PREMIUM**

7   **ANALYSIS.**

8   A   Mr. McKenzie's utility equity risk premium analysis is presented in his Exhibit No. 8.

9   As shown on page 3 of this exhibit, Mr. McKenzie measured the annual equity risk

10   premium over the period of 1974 through 2019 by subtracting the average utility bond

11   yield from the average electric authorized ROE. This produces an average equity risk

12   premium of 3.76%.

13   Mr. McKenzie then performs a regression analysis to measure the inverse

14   relationship between interest rates and equity risk premiums. Using this regression

15   analysis, Mr. McKenzie increases his equity risk premium from 3.76%, up to 5.9% and

16   5.43% based on current and projected utility bond yields, respectively.[41] He then adds

17   these adjusted equity risk premiums to the current and his projected Baa-rated utility

18   bond yields of 3.37% and 4.79%, respectively. This method produces a ROE in the

19   range of 9.27% to 10.22%.[42]

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[41]Exhibit No. 8, pages 1 and 2.
[42]*Id.*

1 **Q**   **DO YOU HAVE ANY CONCERNS WITH MR. MCKENZIE'S ELECTRIC**

2   **UTILITY EQUITY RISK PREMIUM?**

3 **A**   Yes. My main concerns with his electric utility equity risk premium analysis are

4   two-fold. First, I disagree with his projected utility bond yield. Second, I disagree with

5   his reliance on a simple regression analysis to inflate the equity risk premium.

6 **Q**   **PLEASE COMMENT ON MR. MCKENZIE'S PROJECTED UTILITY BOND**

7   **YIELD OF 4.79%.**

8 **A**   Mr. McKenzie uses a projected Aa-rated utility bond yield for the period 2021 through

9   2025 of 4.12%. He then measures the current yield spread of Baa-utility bond yields

10   over Aa utility bond yields of 0.67%. He then adds this current yield spread 0.67% to

11   the projected AA-utility bond yield of 4.12% to produce his projected yield of 4.79%.

12   This projected yield is based on stale data and irrational in today's market. Current

13   Baa-rated utility bond yields are approximately 3.13% as of the 13-week period ending

14   January 22, 2021. Mr. McKenzie's projected increase of 166 basis points[43] in Baa-rated

15   utility bond yields is not reflective of current market conditions or near-term

16   expectations. A near-term forecasted spread of that magnitude is unreasonable and

17   should not be relied upon.

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[43]4.79% - 3.13% = 1.66% or 166 basis points.

1 **Q** **WHY IS MR. MCKENZIE'S USE OF ONLY A SIMPLE INVERSE**

2 **RELATIONSHIP BETWEEN INTEREST RATES AND EQUITY RISK**

3 **PREMIUMS UNREASONABLE?**

4 A Mr. McKenzie's belief that there is a simple inverse relationship between equity risk

5 premiums and interest rates is unsupported by academic research. While academic

6 studies have shown that, in the past, there has been an inverse relationship with these

7 variables, researchers have found that the relationship changes over time and is

8 influenced by changes in perception of the risk of bond investments relative to equity

9 investments, and not simply changes to interest rates.[44]

10 In the 1980s, equity risk premiums were inversely related to interest rates, but

11 that was likely attributable to the interest rate volatility that existed at that time. Interest

12 rate volatility currently is much lower than it was in the 1980s.[45] As such, when interest

13 rates were more volatile, the relative perception of bond investment risk increased

14 relative to the investment risk of equities. This changing investment risk perception

15 caused changes in equity risk premiums.

16 In today's marketplace, interest rate variability is not as extreme as it was during

17 the 1980s. Nevertheless, changes in the perceived risk of bond investments relative to

18 equity investments still drive changes in equity premiums. However, a relative

19 investment risk differential cannot be measured simply by observing nominal interest

20 rates. Changes in nominal interest rates are highly influenced by changes to inflation

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[44]"The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts," Robert S. Harris and Felicia C. Marston, *Journal of Applied Finance*, Volume 11, No. 1, 2001 and "The Risk Premium Approach to Measuring a Utility's Cost of Equity," Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *Financial Management*, Spring 1985.
[45]*Duff & Phelps, 2016 SBBI Yearbook* at 6-7 to 6-10.

1   outlooks, which also change equity return expectations. As such, the relevant factor

2   needed to explain changes in equity risk premiums is the relative changes to the risk of

3   equity versus debt securities investments, not simply changes to interest rates.

4   Importantly, while Mr. McKenzie acknowledges the existence of potential risk

5   differentials, his analysis ignores them. Later, he actually opts to ignore them by not

6   considering the authorized ROE during 2020. Further, He bases his adjustment to the

7   equity risk premium exclusively on changes in nominal interest rates. This is a flawed

8   methodology and does not produce accurate or reliable risk premium ROE estimates.

9   The Commission should reject Mr. McKenzie's flawed results.

10 **Q**   **CAN MR. MCKENZIE'S RISK PREMIUM ANALYSES BE CORRECTED TO**

11   **PRODUCE MORE REASONABLE RESULTS?**

12 **A**   Yes. As I explain above, I generally disagree with Mr. McKenzie's use of a simple

13   linear regression analysis to estimate the risk premium, however, his analysis, when

14   coupled with his current yields, produces a risk premium result of 9.27% which

15   consistent with my recommendations. When updating his current Baa-rated yields with

16   more recent yields of 3.13% would produce a result near the bottom of my

17   recommended range. For the reasons described above, the Commission should reject

18   his long-term projected Baa-rated utility bond yield of 4.79% and the Risk Premium

19   results derived from it.

1   **V.G. Expected Earnings**

2   **Q   PLEASE DESCRIBE MR. MCKENZIE'S EXPECTED EARNINGS ANALYSIS.**

3   A   As shown on his Exhibit No. 9, Mr. McKenzie's expected earnings analysis is based on

4   *Value Line*'s projected earned return on book equities for his proxy group, adjusted to

5   reflect average year equity returns. Based on a review of projected earnings over the

6   next three to five years, Mr. McKenzie estimates an average ROE 10.4%.

7   **Q   IS THE EXPECTED EARNINGS ANALYSIS A REASONABLE METHOD FOR**

8   **ESTIMATING A FAIR ROE FOR THE COMPANIES?**

9   A   No. An expected earnings analysis does not measure the return an investor requires in

10   order to make an investment. In other words, the accounting measure of the earned

11   ROE does not measure the opportunity cost of capital. Rather, it measures the earned

12   return on book equity that companies have experienced in the past or are projected to

13   achieve in the future. The returns investors require in order to assume the risk of an

14   investment are measured from prevailing stock market prices.

15   In addition, the FERC has recently found that the Expected Earnings model does

16   not satisfy the requirements of *Hope*. In part, the FERC states as follows:

17   As a result, the expected return on a utility's book value does not reflect
18   "returns on investments in other enterprises" because book value does
19   not reflect the value of any investment that is available to an investor in
20   the market, outside of the unlikely situation in which market value and
21   book value are exactly equal. Accordingly, we find that relying on the
22   Expected Earnings model would not satisfy the requirements of *Hope*.

23   The return on book value is also not indicative of what return an investor
24   requires to invest in the utility's equity or what return an investor
25   receives on the equity investment, because those returns are determined

1   with respect to the current market price that an investor must pay in
2   order to invest in the equity.[46]

3   Later in the same Opinion, FERC observes that Expected Earnings model does

4   not identify investments of comparable risk. It states as follows:

5   Moreover, we find that the record demonstrates that the
6   Expected Earnings model does not identify investments of comparable
7   risk and which alternatives will have a higher expected return as MISO
8   TOs' witness Mr. McKenzie indicates.[footnote omitted] In particular,
9   because the Expected Earnings model measures returns on book value,
10   without consideration of what market price an investor would have to
11   pay to invest in the relevant company, it does not accurately measure
12   the investor's expected returns on its investment.[47]

13   Additionally, the historical and projected earned ROE for these holding

14 companies can be significantly influenced by the financial performance of nonregulated

15 operations. For these reasons, Mr. McKenzie's expected earnings analysis should be

16 disregarded.

17 **V.H. Non-Utility DCF**

18 **Q**   **DO YOU HAVE ANY ADDITIONAL COMMENTS IN REGARDS TO MR.**

19   **MCKENZIE'S RETURN ESTIMATES?**

20 A   Yes. Mr. McKenzie also performed a DCF model on a non-utility proxy group, which

21   he found to be a reasonable risk proxy for the Companies. The DCF results of his non-

22   utility group range are presented on Exhibit No. 11. The average adjusted DCF results

23   fall within the range of 9.6% to 10.3%. While Mr. McKenzie did not rely on the results

24   of his non-utility DCF analysis in arriving at his recommended range of

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[46] Opinion No. 569, 169 FERC ¶ 61,129 at P. 201-202.
[47] *Id*. at P. 205.

1   reasonableness,[48] he did opine that the analysis is relevant in evaluating a fair ROE for

2   the Companies.[49] I disagree with his assessment. However, because Mr. McKenzie did

3   not rely on these results in developing his inflated recommendation, I will not comment

4   on his non-utility analysis any further.

5   **V.I. Flotation Cost Adjustment**

6   **Q**   **DID MR. MCKENZIE INCLUDE A FLOTATION COST ADJUSTMENT IN HIS**

7   **RECOMMENDED RETURN FOR THE COMPANIES?**

8   A   Yes. Mr. McKenzie included an upward adjustment of 10 basis points to compensate

9   for flotation costs to his return on equity recommendation.[50] He acknowledges there is

10   no standard method for reflecting flotation costs in return on equity methodology,[51] and

11   he further acknowledges the Commission's reluctance to approve a flotation cost

12   adjustment.[52]

13   Mr. McKenzie states that "[t]he most common method used to account for

14   flotation costs in regulatory proceedings is to apply an average flotation-cost percentage

15   to a utility's dividend yield.[53] As shown on his Exhibit No. 10, he calculates the average

16   flotation cost percentage of the most recent share issuances by the electric and gas utility

17   industries as categorized by *Value Line*. He calculates the average flotation cost

18   percentages for the electric utility industry as 2.779%. Similarly, he calculates the gas

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[48]McKenzie Direct at 72-73.
[49]*Id.*
[50] *Id*. at 7.
[51]*Id*. at 67-68.
[52] *Id.* at 68.
[53] *Id.* at 72.

1   utility industry average flotation cost percentage as 3.140%. He calculates an average

2   flotation cost of the aggregate for both industries to be 2.853%. He then applies the

3   average flotation cost adjustment of 2.85% to his proxy group's average dividend yield

4   of 4.00%. This method produces a flotation cost adjustment of 10 basis points for his

5   proxy group.

6   **Q   MR. MCKENZIE ACKNOWLEDGES THAT THE COMMISSION HAS**

7   **HISTORICALLY NOT AWARDED FLOTATION COST ADJUSTMENTS TO**

8   **THE ROE. ARE YOU AWARE OF ANY RECENT DECISIONS ISSUED BY**

9   **THIS COMMISSION THAT CONTINUE TO REJECT THE ALLOWANCE OF**

10   **A FLOTATION COST ADJUSTMENT TO THE ROE?**

11   A   Yes. In Case no. 2019-00271, this Commission stated as follows:

12   In regards to flotation costs, the Commission has historically rejected,
13   and continues to reject, the notion that flotation costs should be included
14   in ROE estimates and notes removal of just the flotation costs will lower
15   Dr. Morin"s recommended ROE from 9.7 percent to 9.5 percent.[54]

16   **Q   IS MR. MCKENZIE'S FLOTATION COST RETURN ON EQUITY ADDER**

17   **REASONABLE?**

18   A   No. Mr. McKenzie's flotation cost return on equity adder is not reasonable or justified

19   for several reasons. First, the adder is not based on the recovery of prudent and

20   verifiable actual flotation costs incurred by the Companies. As discussed at page 71 of

21   Mr. McKenzie's direct testimony, he derives a flotation cost adder based on cost

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[54]Case No. 2019-00271, Kentucky Public Service Commission in the matter of Duke Energy
Kentucky, Inc., *Order*, April 27, 2020 at pg. 46.

1   information of other publicly traded utility holding companies. Because he does not

2   show that his adjustment is based on the Companies' actual and verifiable flotation

3   expenses, there are no means of verifying whether Mr. McKenzie's proposal is

4   reasonable or appropriate. Stated differently, Mr. McKenzie's flotation cost return on

5   equity adder is not based on known and measurable costs. Therefore, the Commission

6   should reject a flotation cost return on equity adder for the Companies.

7   **V.J. Additional Comments**

8 **Q**   **MR. MCKENZIE RELIED, IN PART, ON THE SIGNIFICANT RISE IN THE**

9   **CHICAGO BOARD OPTIONS EXCHANGE VOLATILITY INDEX ("VIX")**

10   **DURING THE PERIOD OF FEBRUARY AND MARCH 2020 AS SUPPORT**

11   **FOR HIS ASSERTION THAT INVESTORS HAVE DRAMATICALLY**

12   **REVISED THEIR RISK PERCEPTIONS. PLEASE RESPOND.**

13 A   Mr. McKenzie observes that between February 19 and March 23, 2020, the VIX rose to

14   levels not seen since the 2008-2009 financial crisis. As he stated, the VIX is a measure

15   of "near-term volatility" expectations. The VIX is calculated based on prices of out-of-

16   the-money call and put options for the S&P 500 and is an estimate of the expected

17   volatility in the overall market for approximately the next 30 days at any given time.

18   Mr. McKenzie's reliance on the VIX to support his assertion with regard to investors'

19   risk should be disregarded when assessing a fair ROE for the Companies for at least two

20   reasons.

21   First, as discussed above, the VIX is a measure of expected volatility in the S&P

22   500 for approximately the next 30 days at any point in time. Establishing a rate of return

1   that can be expected to last several months, if not years, based on the levels of something

2   that represents such a short-term outlook does not make sense and should not be

3   implemented now. If Mr. McKenzie believes that the sharp increase in the VIX levels

4   experienced in early 2020 are somehow relevant to today's cost of equity, then he cannot

5   ignore the subsequent and immediate falls in expected volatility. In other words, spikes

6   in expected short-term volatility are short-lived and should not be relied on in assessing

7   the long-term cost of capital.

8   Second, the paradigm appears to be shifting as the world transitions toward

9   normalcy given the massive vaccine rollouts are approved and implemented. In fact,

10   the United States is expected to have enough vaccines for every adult citizen by May.

11   It is reasonable to expect a recovery in many sectors throughout our economy, especially

12   those that were most harshly hit during pandemic. Such a recovery would likely quell

13   investor fears as it relates to COVID-19 and its going-forward impact on the market.

14   **Q   DO YOU HAVE ANY ADDITIONAL COMMENTS REGARDING MR.**

15   **MCKENZIE'S RECOMMENDATIONS IN THIS PROCEEDING?**

16   A   Yes. In its Order in Case No. 2020-00174, which was issued on January 13, 2021, this

17   Commission awarded Kentucky Power Company an ROE of 9.30%. In its Order, the

18   Commission states as follows:

19   Balancing the needs of Kentucky Power and its customers, and
20   reviewing the record in its entirety in this proceeding, the Commission
21   finds that an ROE of 9.3 percent is fair, just and reasonable. The
22   approved ROE falls within the top range of the Attorney

1   Generals/KIUC's recommended range and although is not in Mr.
2   McKenzie's recommended range it does fall within his models.[55]

3   An important takeaway from the quote above is that this Commission

4   determined that a fair ROE fell below the low-end of Mr. McKenzie's recommended

5   range just less than two months ago. Notably, the Commission's ROE in the above-

6   mentioned Kentucky Power case is consistent with my recommendation in this case,

7   9.30%.

8   **VI. CONCLUSION**

9 **Q**   **WHAT IS YOUR CONCLUSION REGARDING THE APPROPRIATE ROE**

10   **FOR THE COMPANIES BASED ON YOUR ANALYSIS?**

11 A   My analysis supports a reasonable range of the Companies' current cost of equity to be

12   from 9.0% to 9.6%, with an unbiased midpoint estimate of 9.3%. Further, the

13   Commission should reject Mr. McKenzie's recommended cost of common equity for

14   the reasons outlined above.

15 **Q**   **DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

16 A   Yes, it does.

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[55] Case No. 2020-00174, Kentucky Public Service Commission in the matter of Kentucky Power Company, *Order*, January 13, 2021 at pg. 50.

Qualifications of Christopher C. Walters

1 **Q**   **PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A   Christopher C. Walters. My business address is 16690 Swingley Ridge Road, Suite 140,

3   Chesterfield, MO 63017.

4 **Q**   **PLEASE STATE YOUR OCCUPATION.**

5 A   I am an Associate with the firm of Brubaker & Associates, Inc. ("BAI"), energy,

6   economic and regulatory consultants in the field of public utility regulation.

7 **Q**   **PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND**

8   **PROFESSIONAL EMPLOYMENT EXPERIENCE.**

9 A   I received a Bachelor of Science Degree in Business Economics and Finance from

10   Southern Illinois University Edwardsville. I have also received a Master of Business

11   Administration Degree from Lindenwood University.

12   As an Associate at BAI, I perform detailed technical analyses and research to

13   support regulatory projects including expert testimony covering various regulatory

14   issues. Since my career at BAI began in 2011, I have held the positions of Analyst,

15   Associate Consultant, Consultant, Senior Consultant, and Associate. Throughout my

16   tenure, I have been involved with several regulated projects for electric, natural gas and

17   water and wastewater utilities, as well as competitive procurement of electric power and

18   gas supply. My regulatory project work includes estimating the cost of equity capital,

19   capital structure evaluations, assessing financial integrity, merger and acquisition

1   related issues, risk management related issues, depreciation rate studies, and other

2   revenue requirement issues.

3   BAI was formed in April 1995. BAI and its predecessor firm have participated

4   in more than 700 regulatory proceedings in 40 states and Canada.

5   BAI provides consulting services in the economic, technical, accounting, and

6   financial aspects of public utility rates and in the acquisition of utility and energy

7   services through RFPs and negotiations, in both regulated and unregulated markets. Our

8   clients include large industrial and institutional customers, some utilities and, on

9   occasion, state regulatory agencies. We also prepare special studies and reports,

10   forecasts, surveys and siting studies, and present seminars on utility-related issues.

11   In general, we are engaged in energy and regulatory consulting, economic

12   analysis and contract negotiation. In addition to our main office in St. Louis, the firm

13   also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

14   **Q   HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?**

15   A   Yes. I have sponsored testimony before state regulatory commissions including:

16   Arizona, Arkansas, Delaware, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana,

17   Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nevada, Ohio, Oklahoma,

18   Utah, and Wyoming. In addition, I have also sponsored testimony before the City

19   Council of New Orleans and an affidavit before the FERC.

1 **Q** **PLEASE DESCRIBE ANY PROFESSIONAL REGISTRATIONS OR**

2 **ORGANIZATIONS TO WHICH YOU BELONG.**

3 A I earned the Chartered Financial Analyst ("CFA") designation from the CFA Institute.

4 The CFA charter was awarded after successfully completing three examinations which

5 covered the subject areas of financial accounting and reporting analysis, corporate

6 finance, economics, fixed income and equity valuation, derivatives, alternative

7 investments, risk management, and professional and ethical conduct. I am a member of

8 the CFA Institute and the CFA Society of St. Louis.

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Exhibit CCW-1

Rate of Return

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Rate of Return
(June 30, 2022)

Louisville Gas and Electric Company

Line	Description	Weight (1)	Cost (2)	Weighted Cost (3)
1	Long-Term Debt	45.34%	4.04%	1.83%
2	Common Equity	53.13%	**9.30%**	4.94%
3	Short-Term Debt	1.53%	0.46%	0.01%
4	**Total**	**100.00%**		**6.78%**

Kentucky Utilities Company

Line	Description	Weight (1)	Cost (2)	Weighted Cost (3)
5	Long-Term Debt	44.41%	4.16%	1.85%
6	Common Equity	53.14%	**9.30%**	4.94%
7	Short-Term Debt	2.46%	0.46%	0.01%
8	**Total**	**100.00%**		**6.80%**

Sources:
Kentucky Utilities Company Schedule J-1 and Louisville Gas and Electric Company Schedule J-1.

Exhibit CCW-2

Electric Utilities
(Valuation Metrics)

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Electric Utilities
(Valuation Metrics)

Price to Earnings (P/E) Ratio [1]

Line	Company	18-Year Average (1)	2020 [2] (2)	2019 [3] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)	2005 (17)	2004 (18)	2003 (19)	2002 (20)
1	ALLETE	17.76	16.40	24.70	17.23	23.05	18.63	15.06	17.23	18.59	15.88	14.66	15.98	16.08	13.95	14.78	16.55	17.91	25.21	N/A	N/A
2	Alliant Energy	16.47	22.50	21.20	16.60	20.60	22.30	18.07	16.60	15.28	14.50	14.45	12.47	13.86	13.43	15.08	16.82	12.59	14.00	12.69	19.93
3	Ameren Corp.	16.25	22.70	22.10	16.71	20.60	18.29	17.55	16.71	16.52	13.35	11.93	9.66	9.26	14.21	17.45	19.39	16.72	16.28	13.51	15.78
4	American Electric Power	14.61	18.90	21.40	15.88	19.33	15.16	15.77	15.88	14.49	13.77	11.92	13.42	10.03	13.06	16.27	12.91	13.70	12.42	10.66	12.68
5	Avangrid, Inc.	27.38	27.30	20.90	N/A	27.27	20.49	40.94	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	17.99	21.70	15.30	17.28	23.37	18.80	17.60	17.28	14.64	19.30	14.08	12.74	11.42	14.97	30.88	15.39	19.45	24.43	13.84	19.27
7	Black Hills	17.96	17.40	21.70	19.03	19.48	22.29	16.14	19.03	18.24	17.13	31.13	18.10	9.93	N/A	15.02	15.77	17.27	17.13	15.95	12.52
8	CenterPoint Energy	15.15	17.70	19.50	16.96	17.91	21.91	18.10	16.96	18.75	14.85	14.58	13.78	11.81	11.27	15.00	10.27	19.06	17.84	6.05	5.59
9	CMS Energy Corp.	17.50	22.20	24.30	17.30	21.32	20.94	18.29	17.30	16.32	15.07	13.62	12.46	13.56	10.87	26.84	22.18	12.60	12.39	N/A	N/A
10	Consol. Edison	15.78	18.60	21.80	15.90	19.77	18.80	15.59	15.90	14.72	15.39	14.85	13.30	12.55	12.29	13.78	15.49	15.13	18.21	14.30	13.28
11	Dominion Resources	18.69	24.70	NMF	22.97	22.17	21.33	22.14	22.97	19.25	18.91	17.27	14.35	12.74	13.78	20.63	15.98	24.89	15.07	15.24	12.05
12	DTE Energy	15.65	17.60	19.90	14.91	18.59	18.97	18.11	14.91	17.92	14.89	13.51	12.27	10.41	14.81	18.27	17.43	13.80	16.04	13.69	11.28
13	Duke Energy	17.07	17.90	17.80	17.91	19.93	21.25	18.22	17.91	17.45	17.46	13.76	12.69	13.32	17.28	16.13	N/A	N/A	N/A	N/A	N/A
14	Edison Int'l	13.89	NMF	14.30	13.05	17.23	17.92	14.77	13.05	12.70	9.71	11.81	10.32	9.72	12.36	16.03	12.99	11.74	37.59	6.97	7.78
15	El Paso Electric	18.26	33.70	23.20	16.38	21.78	18.66	18.33	16.38	15.88	14.47	12.60	10.72	10.79	11.89	15.26	16.92	26.72	22.03	18.26	22.99
16	Entergy Corp.	13.84	18.40	16.50	12.89	15.01	10.92	12.53	12.89	13.45	12.41	11.22	9.06	11.57	11.98	16.56	19.30	14.28	16.28	13.77	11.53
17	Eversource Energy	18.17	24.00	22.10	17.92	19.47	18.69	18.11	17.92	16.94	19.86	15.35	13.42	11.96	13.66	18.75	27.07	19.76	20.77	13.35	16.07
18	Evergy, Inc.	20.60	19.40	21.80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	14.51	13.60	15.80	16.02	13.41	18.68	12.58	16.02	13.43	19.08	11.30	10.97	11.49	17.97	18.22	16.53	15.37	12.99	11.77	10.46
20	FirstEnergy Corp.	18.51	11.80	23.60	39.79	11.41	15.91	17.02	39.79	13.06	21.10	22.39	11.75	13.02	15.64	15.59	14.23	16.07	14.13	22.47	12.95
21	Fortis Inc.	19.62	20.30	19.20	24.29	16.81	21.60	18.00	24.29	19.97	20.12	18.79	18.22	16.36	17.48	21.14	17.68	N/A	N/A	N/A	N/A
22	Great Plains Energy	15.58	N/A	N/A	16.47	NMF	17.98	19.37	16.47	14.19	15.53	16.11	12.10	16.03	20.55	16.35	18.30	13.96	12.59	12.23	11.09
23	Hawaiian Elec.	18.29	21.60	22.30	15.88	20.69	13.56	20.40	15.88	16.21	15.81	17.09	18.59	19.79	23.16	21.57	20.33	18.27	19.18	13.76	13.47
24	IDACORP, Inc.	16.44	20.00	23.00	14.67	20.60	19.06	16.22	14.67	13.45	12.41	11.54	11.83	10.20	13.93	18.19	15.07	16.70	15.49	26.51	18.88
25	MGE Energy	19.07	25.90	28.40	17.19	29.36	24.90	20.28	17.19	17.01	17.23	15.82	14.98	15.14	14.22	15.01	15.88	22.40	17.98	17.55	15.96
26	NextEra Energy, Inc.	17.38	32.80	26.80	17.25	21.65	20.71	16.89	17.25	16.57	14.43	11.54	10.83	13.42	14.48	18.90	13.65	17.88	13.65	17.88	13.60
27	NorthWestern Corp	17.05	18.90	19.80	16.24	17.85	19.19	18.36	16.24	16.86	15.72	12.62	12.90	11.54	13.87	21.74	25.95	17.09	N/A	N/A	N/A
28	OGE Energy	15.32	15.70	19.00	18.27	18.32	17.68	17.69	18.27	17.69	15.16	14.37	13.31	10.83	12.41	13.75	13.68	14.95	14.13	11.84	14.12
29	Otter Tail Corp.	23.56	16.40	23.50	18.84	22.06	20.19	18.20	18.84	21.12	21.75	47.48	55.10	31.16	30.06	19.02	17.35	15.40	17.34	17.77	16.01
30	PG&E Corp.	16.68	N/A	N/A	15.00	18.28	21.13	26.40	15.00	23.67	20.70	15.46	15.80	13.01	12.08	16.85	14.84	15.37	13.81	9.50	N/A
31	Pinnacle West Capital	15.84	16.00	20.50	15.89	19.28	18.74	16.04	15.89	15.27	14.35	14.60	12.57	13.74	16.07	14.93	13.69	19.24	15.80	13.96	14.43
32	PNM Resources	18.21	20.30	21.80	18.68	20.43	19.83	16.85	18.68	16.51	14.97	14.53	14.05	18.09	N/A	35.65	15.57	17.38	15.02	14.73	15.08
33	Portland General	17.33	29.40	21.90	15.32	20.03	19.06	17.71	15.32	16.88	13.98	12.37	12.00	14.40	16.30	11.94	23.35	N/A	N/A	N/A	N/A
34	PPL Corp.	14.08	11.80	13.10	14.08	17.65	12.83	13.92	14.08	12.84	10.88	10.52	11.93	25.69	17.64	17.26	14.10	15.12	12.51	10.59	11.06
35	Public Serv. Enterprise	13.58	16.10	15.90	12.61	16.31	15.35	12.41	12.61	13.50	12.79	10.40	10.37	10.04	13.65	16.54	17.81	16.74	14.26	10.58	10.00
36	SCANA Corp.	13.94	N/A	N/A	13.68	14.46	16.80	14.67	13.68	14.43	14.80	13.67	12.93	11.63	12.67	14.96	15.42	14.44	13.57	13.05	12.17
37	Sempra Energy	15.69	19.00	23.00	21.87	24.33	24.37	19.73	21.87	19.68	14.89	11.77	12.60	10.09	11.80	14.01	11.50	11.79	8.65	8.96	8.19
38	Southern Co.	15.97	18.50	18.00	16.04	15.48	17.76	15.85	16.04	16.19	16.97	15.85	14.90	13.52	16.13	15.95	16.19	15.92	14.68	14.83	14.63
39	Vectren Corp.	17.22	N/A	N/A	19.98	23.54	19.18	17.92	19.98	20.66	15.02	15.83	15.10	12.89	16.79	15.33	18.92	15.11	17.57	14.80	14.16
40	WEC Energy Group	16.88	24.60	23.50	17.71	20.01	19.95	21.33	17.71	16.50	15.76	14.25	14.01	13.35	14.77	16.47	15.97	14.46	17.51	12.43	10.46
41	Westar Energy	15.56	N/A	N/A	15.36	23.40	21.59	18.45	15.36	14.04	13.43	14.78	12.96	14.95	16.96	14.10	12.18	14.79	17.44	10.78	14.02
42	Xcel Energy Inc.	17.37	23.80	22.70	15.44	20.20	18.48	16.54	15.44	15.04	14.82	14.24	14.13	12.66	13.69	16.65	14.80	15.36	13.65	11.62	40.80
43	Average	16.77	20.49	20.84	17.39	19.81	18.97	18.00	17.39	16.38	15.69	15.30	14.28	13.56	15.18	17.74	16.47	16.52	16.57	13.70	14.31
44	Median	16.14	19.20	21.75	16.54	19.97	18.80	17.71	16.54	16.27	15.04	14.31	12.91	12.82	14.21	16.41	15.88	15.92	15.29	13.60	13.47

Sources:

[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.

[2] The Value Line Investment Survey, November 13, and December 11, 2020 and January 22, 2021.

[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

Kentucky Utilities Company and Louisville Gas and Electric Company

Electric Utilities
(Valuation Metrics)

Market Price to Cash Flow (MP/CF) Ratio [1]

Line	Company	19-Year Average (1)	2020 [2/a] (2)	2019 [3/a] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)	2005 (17)	2004 (18)	2003 (19)	2002 (20)
1	ALLETE	9.49	9.17	11.13	10.16	10.95	8.26	7.49	8.80	9.15	8.18	7.91	8.04	8.51	9.29	10.30	11.06	11.54	11.46	N/A	N/A
2	Alliant Energy	7.93	10.32	10.48	9.71	13.21	10.67	8.86	8.40	7.52	7.50	7.21	6.59	6.23	7.49	7.92	8.00	5.09	5.52	4.76	5.20
3	Ameren Corp.	7.13	8.98	9.20	7.95	8.38	7.44	6.87	6.95	6.61	5.48	5.02	4.23	4.25	6.35	7.69	8.57	8.57	8.24	6.74	7.96
4	American Electric Power	6.53	8.72	9.01	8.03	8.81	7.57	7.09	7.00	6.57	5.93	5.46	5.54	4.71	5.71	6.84	5.54	6.07	5.50	4.69	5.19
5	Avangrid, Inc.	9.74	9.01	9.20	10.24	10.14	8.56	11.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	6.83	8.34	7.50	10.14	9.35	7.63	6.76	7.30	6.21	6.88	6.40	5.80	4.06	5.12	7.58	5.30	6.58	7.58	5.36	5.90
7	Black Hills	7.85	9.26	10.42	8.83	9.20	9.33	8.06	8.81	8.03	6.04	7.85	6.16	4.25	11.26	7.62	6.92	7.57	6.69	6.89	5.92
8	CenterPoint Energy	5.17	5.59	6.76	8.45	6.97	5.96	5.75	6.25	6.56	5.15	5.39	4.70	4.05	4.29	5.17	3.94	4.70	4.26	2.08	2.16
9	CMS Energy Corp.	6.05	9.14	9.62	8.40	8.75	8.50	7.53	7.13	6.68	6.03	5.41	4.48	3.64	3.45	5.57	4.40	4.04	3.20	2.88	NMF
10	Consol. Edison	8.28	8.31	9.78	8.73	9.64	9.39	7.96	7.89	7.77	8.31	8.15	7.39	6.72	6.89	8.31	8.65	8.59	9.31	7.90	7.64
11	Dominion Resources	9.66	10.85	12.82	10.94	11.35	11.59	11.84	12.27	10.88	9.92	9.45	8.12	6.98	8.27	8.65	7.81	10.09	7.68	7.51	6.53
12	DTE Energy	6.42	7.18	9.32	8.54	9.05	8.64	8.52	6.42	6.65	5.91	5.18	4.69	3.59	4.90	5.73	5.21	5.54	6.00	5.62	5.20
13	Duke Energy	7.54	6.80	7.62	7.65	8.40	8.57	7.95	8.12	8.11	9.53	6.56	6.01	5.96	7.13	7.16	N/A	N/A	N/A	N/A	N/A
14	Edison Int'l	5.95	7.70	7.42	13.46	7.05	6.77	5.92	5.68	5.46	4.59	4.22	4.11	3.95	5.63	7.01	5.87	5.61	6.84	2.82	2.96
15	El Paso Electric	6.38	11.07	9.20	9.43	8.54	7.46	6.47	6.33	6.19	5.78	5.16	4.31	3.98	4.95	6.44	6.25	6.67	4.65	3.90	4.39
16	Entergy Corp.	5.75	6.16	5.97	4.92	4.66	4.01	4.21	4.03	4.23	3.90	4.66	5.68	7.96	9.21	7.16	8.76	7.12	6.84	5.57	
17	Eversource Energy	7.12	11.69	10.47	9.16	10.36	10.14	10.12	10.14	8.08	9.30	6.99	4.97	4.61	4.12	6.18	6.02	3.55	3.78	2.85	2.75
18	Evergy, Inc.	8.53	8.53	8.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	6.00	4.41	5.26	5.05	4.45	4.80	4.70	5.09	4.61	5.54	5.86	5.10	5.98	9.65	9.89	8.62	7.97	6.29	5.71	4.97
20	FirstEnergy Corp.	6.83	11.27	10.41	8.84	4.76	5.12	5.38	7.43	6.15	7.42	7.33	4.49	4.91	7.58	7.89	7.53	6.04	5.15	6.90	5.10
21	Fortis Inc.	8.31	9.01	9.27	7.97	8.23	10.46	7.29	9.25	7.93	8.09	8.38	7.40	6.76	7.58	9.18	7.89	N/A	N/A	N/A	N/A
22	Great Plains Energy	6.89	N/A	N/A	N/A	14.62	8.63	6.66	6.45	5.73	6.09	5.74	4.49	5.06	7.71	7.13	7.68	6.70	6.52	5.92	5.14
23	Hawaiian Elec.	8.13	9.78	9.51	8.34	9.21	7.44	9.25	7.64	8.15	8.05	7.73	7.81	6.95	9.10	7.95	8.47	8.29	8.44	6.12	6.20
24	IDACORP, Inc.	8.52	11.14	12.79	11.72	11.56	10.95	9.37	8.59	7.78	7.05	6.64	6.52	5.31	7.10	8.23	7.73	7.55	7.15	7.27	7.53
25	MGE Energy	11.46	13.88	15.04	15.04	17.33	15.66	12.53	11.42	11.20	10.77	9.48	9.05	8.40	8.42	9.23	9.30	11.73	11.04	10.20	8.09
26	NextEra Energy, Inc.	10.30	55.19	12.26	10.77	11.61	9.24	7.93	7.98	7.60	7.58	5.98	5.33	6.09	7.34	9.02	6.51	6.71	6.71	5.97	5.77
27	NorthWestern Corp	7.79	9.24	9.44	8.19	8.82	8.65	8.99	9.01	7.61	6.85	5.89	5.79	5.05	5.57	8.45	9.39	7.31	8.13	N/A	N/A
28	OGE Energy	7.94	8.57	10.42	9.36	10.52	9.03	9.25	10.65	9.93	7.35	7.48	6.61	5.37	6.43	7.58	7.50	7.04	6.73	5.62	5.39
29	Otter Tail Corp.	9.48	10.34	12.60	11.58	11.09	9.38	9.04	9.45	9.58	8.43	9.04	8.07	8.01	11.65	9.53	8.66	8.18	9.01	8.13	8.33
30	PG&E Corp.	5.55	N/A	N/A	- 5.65	7.09	7.26	7.24	5.65	6.84	5.86	5.32	5.42	4.71	4.61	5.84	5.28	5.07	5.13	4.05	14.69
31	Pinnacle West Capital	6.22	7.11	8.21	7.09	8.73	7.89	6.91	7.03	6.85	6.34	5.80	5.65	3.84	4.19	4.76	4.48	7.48	5.88	4.80	5.21
32	PNM Resources	6.83	7.36	7.99	7.57	7.40	7.64	6.95	7.48	6.47	5.80	4.94	4.58	4.53	7.10	10.67	7.62	6.84	5.55	5.72	
33	Portland General	5.93	7.61	7.31	6.56	7.45	7.12	6.73	5.49	6.06	5.08	4.86	4.13	4.63	4.81	5.34	5.74	N/A	N/A	N/A	N/A
34	PPL Corp.	7.44	6.61	8.11	7.02	10.11	8.37	8.73	7.32	6.59	5.87	5.98	7.46	8.82	9.17	8.90	7.58	7.57	6.49	5.41	5.30
35	Public Serv. Enterprise	7.51	7.63	8.63	9.48	8.67	8.56	6.66	6.48	6.40	6.40	6.03	6.04	6.20	8.46	9.83	8.41	8.59	7.17	6.79	6.24
36	SCANA Corp.	7.09	N/A	N/A	N/A	8.26	9.59	8.33	7.50	7.49	7.40	6.75	6.52	5.88	6.38	7.15	7.03	5.40	6.86	6.59	6.36
37	Sempra Energy	8.07	9.96	11.69	10.10	10.65	10.88	9.99	10.77	9.37	7.26	6.13	6.53	6.07	7.07	8.61	7.22	6.96	5.16	4.85	4.00
38	Southern Co.	8.16	8.20	8.54	7.05	7.49	8.83	8.23	8.42	8.30	8.75	8.22	7.79	7.08	8.18	8.62	8.47	8.41	8.28	8.28	7.83
39	Vectren Corp.	7.08	N/A	N/A	N/A	10.32	8.60	7.82	7.57	6.82	5.79	5.81	5.58	5.24	6.90	6.53	7.37	7.06	7.63	7.27	6.92
40	WEC Energy Group	8.86	12.96	12.66	10.82	11.04	10.95	12.90	10.27	9.58	9.24	8.43	8.15	6.87	7.57	7.84	7.27	6.40	6.27	4.91	4.27
41	Westar Energy	6.91	N/A	N/A	N/A	10.87	10.86	9.05	7.93	7.23	6.71	6.67	5.51	5.32	7.09	6.88	5.81	7.00	6.54	4.24	2.94
42	Xcel Energy Inc.	6.76	9.32	9.18	7.90	8.50	8.10	7.62	7.31	7.00	6.85	6.47	6.28	5.43	5.71	6.51	5.54	5.62	5.31	4.27	5.46
43	Average	7.48	10.17	9.56	8.64	9.36	8.65	8.05	7.85	7.39	6.98	6.53	6.00	5.59	6.95	7.72	7.12	7.13	6.77	5.70	5.85
44	Median	7.29	9.01	9.27	8.73	9.05	8.57	7.93	7.54	7.12	6.85	6.27	5.80	5.35	7.09	7.76	7.37	7.04	6.71	5.62	5.52

Sources:

[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.

[2] The Value Line Investment Survey, November 13, and December 11, 2020 and January 22, 2021.

[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

Note:

[a] Based on the average of the high and low price and the projected Cash Flow per share.

Kentucky Utilities Company and Louisville Gas and Electric Company

Electric Utilities
(Valuation Metrics)

Market Price to Book Value (MP/BV) Ratio [1]

Line	Company	16-Year Average (1)	2020 [2/b] (2)	2019 [3/b] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)	2005 (17)
1	ALLETE	1.60	1.45	1.87	1.79	1.78	1.53	1.37	1.42	1.51	1.34	1.35	1.28	1.15	1.55	1.89	2.09	2.22
2	Alliant Energy	1.73	2.08	2.26	2.16	2.38	2.17	1.86	1.86	1.70	1.57	1.46	1.31	1.04	1.33	1.67	1.52	1.33
3	Ameren Corp.	1.49	2.05	2.20	1.95	1.93	1.67	1.46	1.45	1.29	1.18	0.90	0.83	0.78	1.25	1.60	1.62	1.68
4	American Electric Power	1.59	2.05	2.12	1.82	1.88	1.81	1.55	1.54	1.40	1.31	1.23	1.23	1.08	1.48	1.85	1.56	1.57
5	Avangrid, Inc.	0.91	0.94	1.01	1.02	0.93	0.83	0.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.33	1.45	1.55	1.88	1.73	1.57	1.36	1.33	1.25	1.21	1.19	1.07	0.94	1.11	1.29	1.30	1.13
7	Black Hills	1.52	1.66	1.87	1.61	2.06	1.94	1.59	1.79	1.62	1.21	1.14	1.07	0.83	1.22	1.57	1.47	1.63
8	CenterPoint Energy	2.34	1.79	2.13	2.18	2.59	2.73	2.43	2.27	2.30	1.99	1.87	1.96	1.77	2.49	3.13	2.75	3.06
9	CMS Energy Corp.	2.08	2.97	3.20	2.81	2.93	2.72	2.43	2.26	2.09	1.91	1.66	1.48	1.10	1.23	1.82	1.42	1.32
10	Consol. Edison	1.41	1.41	1.57	1.49	1.63	1.58	1.42	1.34	1.38	1.47	1.38	1.22	1.08	1.17	1.47	1.47	1.52
11	Dominion Resources	2.61	2.45	2.19	2.40	2.94	3.15	3.34	3.55	2.97	2.84	2.37	2.01	1.80	2.42	2.69	2.07	2.50
12	DTE Energy	1.49	1.63	1.99	1.91	2.01	1.82	1.65	1.62	1.51	1.35	1.20	1.16	0.89	1.10	1.35	1.29	1.39
13	Duke Energy	1.21	1.34	1.46	1.33	1.41	1.35	1.29	1.28	1.19	1.12	1.11	1.00	0.91	1.06	1.15	N/A	N/A
14	Edison Int'l	1.67	1.67	1.71	1.97	2.17	1.92	1.76	1.68	1.57	1.53	1.24	1.07	1.04	1.56	2.05	1.80	1.93
15	El Paso Electric	1.63	2.09	2.06	1.94	1.87	1.68	1.48	1.52	1.49	1.59	1.64	1.17	0.98	1.33	1.69	1.71	1.76
16	Entergy Corp.	1.75	1.97	2.00	1.74	1.76	1.67	1.40	1.33	1.21	1.31	1.35	1.62	1.66	2.44	2.65	1.89	2.01
17	Eversource Energy	1.48	1.86	1.99	1.68	1.73	1.64	1.53	1.47	1.38	1.28	1.50	1.31	1.12	1.31	1.60	1.22	1.05
18	Evergy, Inc.	1.58	1.55	1.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	2.16	1.18	1.42	1.31	1.20	1.20	1.14	1.28	1.17	1.46	1.95	2.07	2.57	4.39	4.79	3.89	3.60
20	FirstEnergy Corp.	2.02	3.18	3.03	2.67	3.53	2.37	1.16	1.15	1.28	1.44	1.33	1.36	1.54	2.52	2.23	1.92	1.64
21	Fortis Inc.	1.46	1.33	1.38	1.24	1.41	1.26	1.33	1.35	1.45	1.59	1.59	1.56	1.33	1.48	1.63	1.96	N/A
22	Great Plains Energy	1.21	N/A	N/A	N/A	1.33	1.17	1.12	1.11	1.02	0.96	0.93	0.87	0.80	1.11	1.66	1.77	1.86
23	Hawaiian Elec.	1.67	2.01	2.02	1.76	1.76	1.63	1.71	1.49	1.54	1.62	1.54	1.44	1.16	1.61	1.57	2.01	1.78
24	IDACORP, Inc.	1.45	1.80	2.08	1.96	1.94	1.76	1.54	1.45	1.33	1.19	1.17	1.13	0.92	1.09	1.26	1.37	1.22
25	MGE Energy	2.10	2.40	2.79	2.59	2.88	2.60	2.10	2.10	2.06	1.92	1.75	1.65	1.54	1.62	1.75	1.83	2.09
26	NextEra Energy, Inc.	2.65	11.84	2.74	2.32	2.35	2.30	2.09	2.15	1.93	1.74	1.55	1.49	1.70	2.06	2.34	1.80	1.93
27	NorthWestern Corp	1.47	1.53	1.67	1.48	1.64	1.68	1.60	1.54	1.56	1.42	1.35	1.22	1.07	1.15	1.48	1.65	1.42
28	OGE Energy	1.85	1.91	2.03	1.75	1.82	1.73	1.79	2.22	2.24	1.94	1.90	1.70	1.37	1.52	1.98	1.91	1.80
29	Otter Tail Corp.	1.85	2.11	2.66	2.49	2.33	1.90	1.78	1.90	1.96	1.58	1.35	1.19	1.18	1.71	1.93	1.76	1.74
30	PG&E Corp.	1.60	N/A	N/A	1.70	1.71	1.69	1.57	1.39	1.38	1.41	1.46	1.56	1.41	1.50	1.94	1.83	1.84
31	Pinnacle West Capital	1.43	1.65	1.90	1.74	1.91	1.72	1.52	1.44	1.47	1.39	1.25	1.14	0.95	1.00	1.26	1.26	1.25
32	PNM Resources	1.28	1.75	2.23	1.83	1.84	1.56	1.33	1.21	1.09	0.98	0.80	0.69	0.56	0.66	1.23	1.21	1.45
33	Portland General	1.34	1.64	1.77	1.56	1.69	1.56	1.42	1.37	1.28	1.14	1.09	0.94	0.92	1.05	1.32	1.36	N/A
34	PPL Corp.	2.09	1.56	1.84	1.81	2.40	2.46	2.24	1.64	1.55	1.58	1.47	1.61	2.10	3.19	3.05	2.43	2.50
35	Public Serv. Enterprise	1.89	1.54	1.92	1.81	1.68	1.67	1.58	1.57	1.44	1.46	1.59	1.67	1.78	2.58	2.99	2.46	2.45
36	SCANA Corp.	1.51	N/A	N/A	N/A	1.65	1.74	1.47	1.48	1.48	1.48	1.36	1.33	1.20	1.45	1.62	1.64	1.72
37	Sempra Energy	1.80	1.73	2.13	2.06	2.24	2.00	2.17	2.20	1.84	1.53	1.28	1.35	1.32	1.60	1.87	1.70	1.73
38	Southern Co.	2.05	2.13	2.05	1.89	2.07	2.01	1.99	2.02	2.04	2.15	1.99	1.83	1.73	2.12	2.24	2.23	2.35
39	Vectren Corp.	1.83	N/A	N/A	N/A	2.75	2.29	2.11	2.08	1.82	1.57	1.53	1.41	1.34	1.64	1.74	1.77	1.82
40	WEC Energy Group	1.97	2.68	2.58	2.11	2.10	2.09	1.82	2.34	2.21	2.05	1.81	1.65	1.40	1.57	1.77	1.71	1.62
41	Westar Energy	1.37	N/A	N/A	N/A	1.94	1.95	1.49	1.44	1.33	1.26	1.20	1.10	0.93	1.10	1.36	1.30	1.41
42	Xcel Energy Inc.	1.63	2.26	2.26	1.97	2.06	1.88	1.66	1.55	1.50	1.51	1.41	1.32	1.19	1.30	1.53	1.40	1.38
43	Average	1.72	2.13	2.03	1.88	2.00	1.85	1.67	1.68	1.60	1.51	1.43	1.35	1.25	1.63	1.90	1.78	1.80
44	Median	1.61	1.79	2.02	1.83	1.91	1.74	1.57	1.53	1.49	1.47	1.37	1.31	1.15	1.48	1.71	1.71	1.73

Sources:

[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.

[2] The Value Line Investment Survey, November 13, and December 11, 2020 and January 22, 2021.

[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.
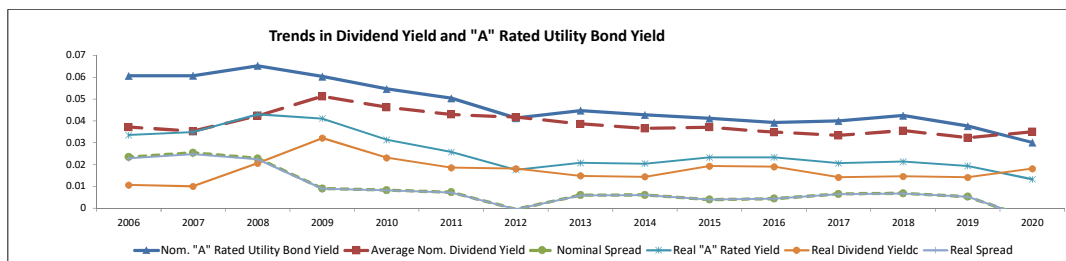
Notes:

[b] Based on the average of the high and low price and the projected Book Value per share.

Kentucky Utilities Company and Louisville Gas and Electric Company

Electric Utilities
(Valuation Metrics)

Dividend Yield[1]

Line	Company	15-Year Average (1)	2020 [2][a] (2)	2019 [3][a] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)
1	ALLETE	3.93%	3.72%	2.92%	2.99%	2.97%	3.56%	3.97%	3.92%	3.89%	4.49%	4.58%	5.03%	5.79%	4.37%	3.60%	3.16%
2	Alliant Energy	3.71%	3.10%	2.95%	3.20%	3.07%	3.21%	3.60%	3.53%	3.74%	4.07%	4.28%	4.61%	5.73%	4.10%	3.13%	3.32%
3	Ameren Corp.	4.38%	2.73%	2.67%	3.04%	3.12%	3.50%	3.96%	4.02%	4.61%	4.97%	5.28%	5.76%	5.98%	6.21%	4.88%	4.93%
4	American Electric Power	4.04%	3.34%	3.22%	3.60%	3.42%	3.54%	3.80%	3.83%	4.23%	4.58%	4.96%	4.90%	5.50%	4.20%	3.40%	4.06%
5	Avangrid, Inc.	3.77%	3.79%	3.51%	3.49%	3.79%	4.26%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	3.74%	3.81%	3.47%	2.93%	3.14%	3.39%	3.97%	3.99%	4.51%	4.55%	4.54%	4.76%	4.49%	3.39%	2.68%	2.52%
7	Black Hills	3.73%	3.21%	2.87%	3.31%	2.75%	2.87%	3.55%	2.84%	3.19%	4.39%	4.64%	4.79%	6.17%	4.21%	3.40%	3.79%
8	CenterPoint Energy	4.42%	3.79%	3.09%	4.09%	4.79%	4.70%	5.06%	3.94%	3.57%	4.04%	4.27%	5.29%	6.37%	4.98%	3.87%	4.39%
9	CMS Energy Corp.	3.24%	2.83%	2.70%	3.03%	2.88%	2.99%	3.36%	3.59%	3.76%	4.16%	4.25%	3.98%	3.97%	2.69%	1.16%	N/A
10	Consol. Edison	4.41%	3.90%	3.52%	3.68%	3.40%	3.62%	4.12%	4.38%	4.25%	4.07%	4.46%	5.16%	5.99%	5.67%	4.84%	5.04%
11	Dominion Resources	4.08%	4.64%	4.85%	4.72%	3.88%	3.82%	3.66%	3.43%	3.78%	4.06%	4.13%	4.41%	5.20%	3.77%	3.32%	3.60%
12	DTE Energy	4.15%	3.98%	3.19%	3.34%	3.15%	3.34%	3.53%	3.54%	3.84%	4.19%	4.68%	4.75%	6.29%	5.24%	4.36%	4.86%
13	Duke Energy	4.73%	4.61%	4.17%	4.54%	4.15%	4.26%	4.34%	4.26%	4.45%	4.68%	5.21%	5.71%	6.25%	5.16%	4.44%	N/A
14	Edison Int'l	3.15%	4.21%	3.82%	3.84%	2.87%	2.81%	2.83%	2.62%	2.85%	2.97%	3.37%	3.66%	3.95%	2.69%	2.21%	2.58%
15	El Paso Electric	2.69%	2.46%	2.48%	2.55%	2.49%	2.75%	3.13%	2.97%	2.99%	2.97%	2.11%	N/A	N/A	N/A	N/A	N/A
16	Entergy Corp.	4.05%	3.55%	3.57%	4.41%	4.49%	4.55%	4.59%	4.47%	5.07%	4.91%	4.85%	4.20%	3.97%	2.92%	2.39%	2.82%
17	Eversource Energy	3.28%	2.84%	2.86%	3.32%	3.14%	3.22%	3.34%	3.40%	3.48%	3.52%	3.23%	3.64%	4.16%	3.25%	2.60%	3.27%
18	Evergy, Inc.	3.31%	3.46%	3.15%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	3.85%	3.83%	3.07%	3.32%	3.51%	3.75%	3.88%	3.69%	4.69%	5.73%	4.96%	4.95%	4.26%	2.78%	2.48%	2.83%
20	FirstEnergy Corp.	4.32%	3.69%	3.58%	5.17%	4.62%	4.31%	4.23%	4.26%	4.26%	4.26%	4.90%	5.23%	5.76%	5.09%	3.21%	3.40%
21	Fortis Inc.	3.89%	3.90%	3.69%	4.07%	3.69%	3.80%	3.76%	3.88%	3.84%	3.84%	3.64%	3.58%	3.80%	4.21%	3.76%	2.79%
22	Great Plains Energy	4.52%	N/A	N/A	N/A	3.58%	3.64%	3.76%	3.62%	3.84%	4.08%	4.15%	4.49%	5.03%	6.96%	5.49%	5.60%
23	Hawaiian Elec.	4.52%	3.03%	3.10%	3.54%	3.65%	3.99%	4.05%	4.76%	4.72%	4.70%	5.04%	5.51%	6.89%	5.00%	5.18%	4.59%
24	IDACORP, Inc.	3.20%	2.98%	2.52%	2.61%	2.58%	2.77%	3.06%	3.12%	3.21%	3.28%	3.10%	3.44%	4.46%	3.95%	3.55%	3.39%
25	MGE Energy	3.13%	2.22%	2.01%	2.16%	1.95%	2.23%	2.78%	2.78%	2.91%	3.25%	3.63%	3.98%	4.36%	4.24%	4.14%	4.25%
26	NextEra Energy, Inc.	2.93%	0.61%	2.42%	2.68%	2.79%	2.91%	3.01%	3.02%	3.30%	3.65%	3.96%	3.90%	N/A	N/A	N/A	N/A
27	NorthWestern Corp	4.07%	3.82%	3.43%	3.86%	3.52%	3.43%	3.61%	3.30%	3.66%	4.17%	4.51%	4.93%	5.75%	5.38%	4.09%	3.65%
28	OGE Energy	3.68%	4.55%	3.60%	3.98%	3.61%	3.87%	3.51%	2.63%	2.48%	2.94%	3.06%	3.68%	4.96%	4.52%	3.77%	3.99%
29	Otter Tail Corp.	4.10%	3.37%	2.70%	2.92%	3.12%	3.87%	4.33%	4.14%	4.11%	5.21%	5.57%	5.68%	5.38%	4.52%	3.46%	3.92%
30	PG&E Corp.	3.70%	N/A	N/A	N/A	2.42%	3.22%	3.45%	3.96%	4.20%	4.25%	4.24%	4.08%	4.26%	4.01%	3.07%	3.22%
31	Pinnacle West Capital	4.48%	3.90%	3.35%	3.55%	3.16%	3.46%	3.88%	4.09%	3.98%	5.32%	4.81%	5.43%	6.76%	6.17%	4.75%	4.67%
32	PNM Resources	3.24%	3.00%	2.55%	2.79%	2.53%	2.69%	2.90%	2.79%	2.99%	2.96%	3.19%	4.09%	4.76%	4.85%	3.36%	3.21%
33	Portland General	3.67%	3.34%	2.97%	3.27%	2.92%	3.06%	3.27%	3.34%	3.67%	4.11%	4.37%	5.20%	5.36%	4.28%	3.34%	2.54%
34	PPL Corp.	4.54%	6.05%	5.15%	5.61%	4.24%	4.25%	4.55%	4.45%	4.81%	5.07%	5.10%	5.12%	4.51%	3.10%	2.69%	3.41%
35	Public Serv. Enterprise	3.82%	4.05%	3.30%	3.49%	3.74%	3.78%	3.81%	3.92%	4.35%	4.55%	4.24%	4.30%	4.30%	3.26%	2.73%	3.47%
36	SCANA Corp.	4.37%	N/A	N/A	N/A	4.03%	3.29%	3.90%	4.05%	4.15%	4.25%	4.78%	4.93%	5.67%	4.92%	4.29%	4.21%
37	Sempra Energy	2.97%	3.35%	2.97%	3.20%	2.92%	2.92%	2.71%	2.61%	3.03%	3.71%	3.65%	3.08%	3.23%	2.62%	2.08%	2.47%
38	Southern Co.	4.70%	4.49%	4.57%	5.27%	4.63%	4.42%	4.78%	4.69%	4.61%	4.29%	4.63%	5.13%	5.52%	4.58%	4.39%	4.52%
39	Vectren Corp.	4.38%	N/A	N/A	N/A	2.79%	3.31%	3.60%	3.62%	4.15%	4.82%	5.06%	5.53%	5.85%	4.79%	4.53%	4.52%
40	WEC Energy Group	3.04%	2.85%	2.85%	3.38%	3.31%	3.35%	3.49%	3.40%	3.49%	3.24%	2.35%	2.97%	3.16%	2.41%	2.14%	2.18%
41	Westar Energy	4.37%	N/A	N/A	N/A	3.00%	2.90%	3.73%	3.88%	4.27%	4.57%	4.84%	5.32%	6.27%	5.22%	4.16%	4.28%
42	Xcel Energy Inc.	3.84%	2.80%	2.85%	3.25%	3.10%	3.33%	3.69%	3.83%	3.86%	3.90%	4.20%	4.54%	5.14%	4.70%	4.05%	4.40%
43	**Average**	**3.87%**	**3.51%**	**3.23%**	**3.56%**	**3.34%**	**3.49%**	**3.71%**	**3.66%**	**3.87%**	**4.18%**	**4.30%**	**4.63%**	**5.13%**	**4.24%**	**3.53%**	**3.72%**
44	Median	3.85%	3.55%	3.10%	3.36%	3.15%	3.43%	3.71%	3.76%	3.85%	4.18%	4.42%	4.76%	5.17%	4.22%	3.43%	3.62%
45	20-Yr Treasury Yields[4]	3.26%	1.35%	2.40%	3.02%	2.65%	2.23%	2.55%	3.07%	3.12%	2.54%	3.62%	4.03%	4.11%	4.36%	4.91%	4.99%
46	20-Yr TIPS[4]	1.15%	-0.30%	0.60%	0.94%	0.75%	0.66%	0.78%	0.87%	0.75%	0.21%	1.19%	1.73%	2.21%	2.19%	2.36%	2.31%
47	Implied Inflation[b]	2.09%	1.66%	1.79%	2.06%	1.89%	1.56%	1.75%	2.19%	2.35%	2.33%	2.40%	2.26%	1.85%	2.13%	2.49%	2.62%
48	**Real Dividend Yield[c]**	**1.75%**	**1.82%**	**1.42%**	**1.47%**	**1.42%**	**1.90%**	**1.93%**	**1.44%**	**1.49%**	**1.81%**	**1.86%**	**2.32%**	**3.22%**	**2.07%**	**1.01%**	**1.07%**

A-Rated Utility

Line		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
49	**Nominal "A" Rated Yield[5]**	**4.75%**	**3.02%**	**3.77%**	**4.25%**	**4.00%**	**3.93%**	**4.12%**	**4.28%**	**4.48%**	**4.13%**	**5.04%**	**5.46%**	**6.04%**	**6.53%**	**6.07%**	**6.07%**
50	**Real "A" Rated Yield**	**2.60%**	**1.33%**	**1.94%**	**2.14%**	**2.07%**	**2.34%**	**2.33%**	**2.04%**	**2.08%**	**1.76%**	**2.58%**	**3.13%**	**4.11%**	**4.31%**	**3.49%**	**3.36%**

Baa-Rated Utility

Line		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
51	**Nominal "Baa" Rated Yield**	**5.31%**	**3.66%**	**4.19%**	**4.67%**	**4.38%**	**4.67%**	**5.03%**	**4.80%**	**4.98%**	**4.83%**	**5.57%**	**5.96%**	**7.06%**	**7.25%**	**6.33%**	**6.32%**
52	**Real "Baa" Rated Yield**	**3.16%**	**1.97%**	**2.36%**	**2.55%**	**2.44%**	**3.07%**	**3.22%**	**2.55%**	**2.57%**	**2.44%**	**3.09%**	**3.62%**	**5.11%**	**5.01%**	**3.74%**	**3.60%**

Spreads (A-Rated Utility Bond - Stock)

Line		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
53	**Nominal Spread[d]**	**0.87%**	**-0.49%**	**0.53%**	**0.69%**	**0.66%**	**0.44%**	**0.40%**	**0.61%**	**0.61%**	**-0.05%**	**0.74%**	**0.84%**	**0.91%**	**2.29%**	**2.54%**	**2.35%**
54	**Real Spread[e]**	**0.85%**	**-0.48%**	**0.52%**	**0.68%**	**0.65%**	**0.44%**	**0.40%**	**0.60%**	**0.59%**	**-0.05%**	**0.72%**	**0.82%**	**0.89%**	**2.24%**	**2.48%**	**2.29%**

Spreads (Baa-Rated Utility Bond - Stock)

Line		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
55	**Nominal Spread[b]**	**1.44%**	**0.15%**	**0.96%**	**1.11%**	**1.04%**	**1.19%**	**1.31%**	**1.14%**	**1.11%**	**0.65%**	**1.26%**	**1.34%**	**1.92%**	**3.00%**	**2.80%**	**2.60%**
56	**Real Spread[c]**	**1.41%**	**0.15%**	**0.94%**	**1.09%**	**1.02%**	**1.17%**	**1.29%**	**1.11%**	**1.09%**	**0.63%**	**1.23%**	**1.31%**	**1.89%**	**2.94%**	**2.73%**	**2.53%**

Spreads (Treasury Bond - Stock)

Line		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
57	**Nominal[f]**	**-0.61%**	**-2.15%**	**-0.83%**	**-0.54%**	**-0.69%**	**-1.26%**	**-1.17%**	**-0.59%**	**-0.75%**	**-1.64%**	**-0.68%**	**-0.60%**	**-1.02%**	**0.12%**	**1.38%**	**1.27%**
58	**Real[g]**	**-0.60%**	**-2.12%**	**-0.82%**	**-0.53%**	**-0.68%**	**-1.24%**	**-1.15%**	**-0.58%**	**-0.73%**	**-1.60%**	**-0.67%**	**-0.58%**	**-1.01%**	**0.12%**	**1.34%**	**1.24%**

Trends in Dividend Yield and "A" Rated Utility Bond Yield

Legend: Nom. "A" Rated Utility Bond Yield — Average Nom. Dividend Yield — Nominal Spread — Real "A" Rated Yield — Real Dividend Yieldc — Real Spread

Sources:
[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.
[2] The Value Line Investment Survey, November 13, and December 11, 2020 and January 22, 2021.
[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.
[4] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.
[5] www.moodys.com, Bond Yields and Key Indicators, through December 31, 2020.
Notes:
[a] Based on the average of the high and low price and the projected Dividends Declared per share, published in the Value Line Investment Survey.
[b] Line 47 = (1 + Line 45) / (1 + Line 46) - 1.
[c] Line 48 = (1 + Line 43) / (1 + Line 47) - 1.
[d] The spread being measured here is the nominal A-rated utility bond yield over the average nominal utility dividend yield; (Line 49 - Line 43).
[e] The spread being measured here is the real A-rated utility bond yield over the average real utility dividend yield; Line 50 - Line 48)
[f] The spread being measured here is the nominal 20-Year Treasury yield over the average nominal utility dividend yield; (Line 45 - Line 43)
[g] The spread being measured here is the real 20-Year TIPS yield over the average real utility dividend yield; Line 48 - Line 46)

Kentucky Utilities Company and Louisville Gas and Electric Company

Electric Utilities
(Valuation Metrics)

		Earnings per Share[1]														
Line	Company	15-Year Average (1)	2020 [2] (2)	2019 [3] (3)	2018 (4)	2017 (5)	2016 (6)	2015 (7)	2014 (8)	2013 (9)	2012 (10)	2011 (11)	2010 (12)	2009 (13)	2008 (14)	2007 (15)	2006 (16)
1	ALLETE	2.87	3.20	3.33	3.38	3.13	3.14	3.38	2.90	2.63	2.58	2.65	2.19	1.89	2.82	3.08	2.77
2	Alliant Energy	1.64	2.45	2.33	2.19	1.99	1.65	1.69	1.74	1.65	1.53	1.38	1.38	0.95	1.27	1.35	1.03
3	Ameren Corp.	2.76	3.45	3.35	3.32	2.77	2.68	2.38	2.40	2.10	2.41	2.47	2.77	2.78	2.88	2.98	2.66
4	American Electric Power	3.38	4.30	4.08	3.90	3.62	4.23	3.59	3.34	3.18	2.98	3.13	2.60	2.97	2.99	2.86	2.86
5	Avangrid, Inc.	1.77	1.80	2.40	1.92	1.67	1.98	0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.75	1.85	2.90	2.07	1.95	2.15	1.89	1.84	1.85	1.32	1.72	1.65	1.58	1.36	0.72	1.47
7	Black Hills	2.46	3.65	3.45	3.47	3.38	2.63	2.83	2.89	2.61	1.97	1.01	1.66	2.32	0.18	2.68	2.21
8	CenterPoint Energy	1.22	1.24	1.49	0.74	1.57	1.00	1.08	1.42	1.24	1.35	1.27	1.07	1.01	1.30	1.17	1.33
9	CMS Energy Corp.	1.64	2.65	2.39	2.32	2.17	1.98	1.89	1.74	1.66	1.53	1.45	1.33	0.93	1.23	0.64	0.64
10	Consol. Edison	3.73	4.00	3.95	4.55	4.10	3.94	4.05	3.62	3.93	3.86	3.57	3.47	3.14	3.36	3.48	2.95
11	Dominion Resources	2.89	3.10	2.15	3.25	3.53	3.44	3.20	3.05	3.09	2.75	2.76	2.89	2.64	3.04	2.13	2.40
12	DTE Energy	4.37	6.80	6.31	6.17	5.73	4.83	4.44	5.10	3.76	3.88	3.67	3.74	3.24	2.73	2.66	2.45
13	Duke Energy	3.94	5.20	5.05	4.13	4.22	3.71	4.10	4.13	3.98	3.71	4.14	4.02	3.39	3.03	3.60	2.73
14	Edison Int'l	3.36	1.70	4.65	-1.26	4.51	3.94	4.15	4.33	3.78	4.55	3.23	3.35	3.24	3.68	3.32	3.28
15	El Paso Electric	2.07	2.00	2.70	2.07	2.42	2.39	2.03	2.27	2.20	2.26	2.48	2.07	1.50	1.73	1.63	1.27
16	Entergy Corp.	6.01	5.65	6.30	5.88	5.19	6.88	5.81	5.77	4.96	6.02	7.55	6.66	6.30	6.20	5.60	5.36
17	Eversource Energy	2.44	3.60	3.45	3.25	3.11	2.96	2.76	2.58	2.49	1.89	2.22	2.10	1.91	1.86	1.59	0.82
18	Evergy, Inc.	2.72	2.65	2.79	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	3.00	2.90	3.00	2.07	2.78	1.80	2.54	2.10	2.31	1.92	3.75	3.87	4.29	4.10	4.03	3.50
20	FirstEnergy Corp.	2.57	1.75	1.85	1.33	2.73	2.10	2.00	0.85	2.97	2.13	1.88	3.25	3.32	4.38	4.22	3.82
21	Fortis Inc.	1.87	2.50	2.68	2.52	2.66	1.89	2.11	1.38	1.63	1.65	1.74	1.62	1.51	1.52	1.29	1.36
22	Great Plains Energy	1.33	N/A	N/A	N/A	-0.06	1.61	1.37	1.57	1.62	1.35	1.25	1.53	1.03	1.16	1.85	1.62
23	Hawaiian Elec.	1.53	1.80	1.90	1.85	1.64	2.29	1.50	1.64	1.62	1.67	1.44	1.21	0.91	1.07	1.11	1.33
24	IDACORP, Inc.	3.45	4.65	4.45	4.49	4.21	3.94	3.87	3.85	3.64	3.37	3.36	2.95	2.64	2.18	1.86	2.35
25	MGE Energy	1.98	2.65	2.51	2.43	2.20	2.18	2.06	2.32	2.16	1.86	1.76	1.67	1.47	1.59	1.51	1.37
26	NextEra Energy, Inc.	1.32	1.85	1.94	1.67	1.63	1.45	1.52	1.40	1.21	1.14	1.21	1.19	0.99	1.02	0.82	0.81
27	NorthWestern Corp	2.58	3.15	3.55	3.40	3.34	3.39	2.90	2.99	2.46	2.26	2.53	2.14	2.02	1.77	1.44	1.31
28	OGE Energy	1.72	2.05	2.24	2.12	1.92	1.69	1.69	1.98	1.94	1.79	1.73	1.50	1.33	1.25	1.32	1.23
29	Otter Tail Corp.	1.44	2.30	2.17	2.06	1.86	1.60	1.56	1.55	1.37	1.05	0.45	0.38	0.71	1.09	1.78	1.69
30	PG&E Corp.	1.49	N/A	N/A	-13.25	3.50	2.83	2.00	3.06	1.83	2.07	2.78	2.82	3.03	3.22	2.78	2.76
31	Pinnacle West Capital	3.58	5.10	4.50	4.54	4.43	3.95	3.92	3.58	3.66	3.50	2.99	3.08	2.26	2.12	2.96	3.17
32	PNM Resources	1.37	2.20	2.20	1.66	1.92	1.65	1.64	1.45	1.41	1.31	1.08	0.87	0.58	0.11	0.76	1.72
33	Portland General	1.89	1.55	2.40	2.37	2.29	2.16	2.04	2.18	1.77	1.87	1.95	1.66	1.31	1.39	2.33	1.14
34	PPL Corp.	2.36	2.35	2.40	2.58	2.11	2.79	2.37	2.38	2.38	2.61	2.61	2.29	1.19	2.45	2.63	2.29
35	Public Serv. Enterprise	2.89	3.40	3.70	2.76	2.82	2.83	3.30	2.99	2.45	2.44	3.11	3.07	3.08	2.90	2.59	1.85
36	SCANA Corp.	3.30	N/A	N/A	N/A	4.20	4.16	3.81	3.79	3.39	3.15	2.97	2.98	2.85	2.95	2.74	2.59
37	Sempra Energy	4.77	6.80	5.85	5.48	4.63	4.24	5.23	4.63	4.22	4.35	4.47	4.02	4.78	4.43	4.26	4.23
38	Southern Co.	2.68	3.15	3.10	3.00	3.21	2.83	2.84	2.77	2.70	2.67	2.55	2.36	2.32	2.25	2.28	2.10
39	Vectren Corp.	1.94	N/A	N/A	N/A	2.60	2.55	2.39	2.02	1.66	1.94	1.73	1.64	1.79	1.63	1.83	1.44
40	WEC Energy Group	2.43	3.75	3.58	3.34	3.14	2.96	2.34	2.59	2.51	2.35	2.18	1.92	1.60	1.52	1.42	1.32
41	Westar Energy	1.96	N/A	N/A	N/A	2.27	2.43	2.09	2.35	2.27	2.15	1.79	1.80	1.28	1.31	1.84	1.88
42	Xcel Energy Inc.	1.95	2.80	2.60	2.47	2.30	2.21	2.10	2.03	1.91	1.85	1.72	1.56	1.49	1.46	1.35	1.35
43	**Average**	**2.59**	**3.13**	**3.23**	**2.87**	**2.90**	**2.81**	**2.67**	**2.66**	**2.50**	**2.43**	**2.44**	**2.36**	**2.19**	**2.21**	**2.26**	**2.11**
44	**Industry Average Growth**	**2.95%**	**-3.09%**	**12.53%**	**-0.78%**	**3.24%**	**5.25%**	**0.08%**	**6.36%**	**3.26%**	**-0.70%**	**3.61%**	**7.71%**	**-1.07%**	**-2.17%**	**7.14%**	

Sources:
[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 25, 2019.
[2] The Value Line Investment Survey, November 13, and December 11, 2020 and January 22, 2021.
[3] The Value Line Investment Survey, January 24, February 14, and March 13, 2020.
Notes:
PG&E is excluded from 2017, 2018, and 2019 average calculations due to their Dividend Suspension.

Kentucky Utilities Company and Louisville Gas and Electric Company

Electric Utilities
(Valuation Metrics)

		Cash Flow / Capital Spending			
Line	Company	2019 (1)	2020 (2)	2021 (3)	3 - 5 yr Projection (4)
1	ALLETE	0.63x	0.74x	0.82x	1.95x
2	Alliant Energy	0.73x	0.82x	0.98x	1.02x
3	Ameren Corp.	0.79x	0.51x	0.76x	0.95x
4	American Electric Power	0.75x	0.74x	0.78x	0.89x
5	Avangrid, Inc.	0.70x	0.56x	0.54x	0.67x
6	Avista Corp.	0.89x	0.85x	0.89x	1.04x
7	Black Hills	0.51x	0.72x	0.78x	1.21x
8	CenterPoint Energy	0.83x	0.88x	0.70x	0.76x
9	CMS Energy Corp.	0.79x	0.82x	0.68x	0.91x
10	Consol. Edison	0.79x	0.82x	0.90x	1.02x
11	Dominion Resources	0.81x	1.00x	0.86x	1.03x
12	DTE Energy	0.83x	0.67x	0.82x	1.31x
13	Duke Energy	0.78x	0.86x	0.87x	1.05x
14	Edison Int'l	0.69x	0.67x	0.75x	0.89x
15	El Paso Electric	0.96x	1.00x	0.83x	0.86x
16	Entergy Corp.	0.79x	0.81x	0.97x	1.11x
17	Eversource Energy	0.78x	0.95x	0.86x	1.06x
18	Evergy, Inc.	1.34x	1.06x	1.00x	1.38x
19	Exelon Corp.	1.18x	1.30x	1.30x	1.43x
20	FirstEnergy Corp.	0.74x	0.96x	0.91x	1.05x
21	Fortis Inc.	0.68x	0.60x	0.73x	0.85x
22	Hawaiian Elec.	1.12x	1.10x	1.35x	1.17x
23	IDACORP, Inc.	1.25x	1.25x	1.21x	1.39x
24	MGE Energy	0.97x	0.73x	1.09x	1.22x
25	NextEra Energy, Inc.	0.67x	0.58x	0.68x	0.68x
26	NorthWestern Corp	1.07x	0.98x	0.83x	1.13x
27	OGE Energy	1.26x	1.43x	1.21x	1.40x
28	Otter Tail Corp.	0.80x	0.45x	1.21x	1.75x
29	Pinnacle West Capital	0.98x	0.98x	0.78x	1.13x
30	PNM Resources	0.72x	0.59x	0.51x	1.25x
31	Portland General	0.99x	0.75x	1.01x	1.46x
32	PPL Corp.	0.92x	1.06x	1.12x	1.54x
33	Public Serv. Enterprise	1.07x	1.00x	1.27x	1.48x
34	Sempra Energy	0.66x	0.92x	0.80x	1.29x
35	Southern Co.	0.88x	1.01x	0.95x	1.19x
36	WEC Energy Group	0.91x	0.70x	0.74x	0.97x
37	Xcel Energy Inc.	0.69x	0.99x	0.94x	1.09x
38	Average	0.86x	0.86x	0.90x	1.15x
39	Median	0.80x	0.85x	0.86x	1.11x

Sources:

  The Value Line Investment Survey Investment Analyzer Software,
   downloaded on June 25, 2019.
  The Value Line Investment Survey, November 13, and December 11, 2020 and Janu
  The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

Notes:

  Based on the projected Cash Flow per share and Capital Spending per share.

Exhibit CCW-3

Proxy Group

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Proxy Group

Line	Company	Credit Ratings[1]		Common Equity Ratios	
		S&P (1)	Moody's (2)	MI[1] (3)	Value Line[2] (4)
1	ALLETE, Inc.	BBB	Baa1	56.1%	61.4%
2	Alliant Energy Corporation	A-	Baa2	43.5%	48.5%
3	Ameren Corporation	BBB+	Baa1	44.7%	47.1%
4	Avangrid, Inc.	BBB+	Baa1	64.2%	69.4%
5	Avista Corporation	BBB	Baa2	46.2%	50.6%
6	Black Hills Corporation	BBB+	Baa2	39.6%	42.9%
7	CMS Energy Corporation	BBB+	Baa1	27.3%	29.4%
8	Consolidated Edison, Inc.	A-	Baa2	44.2%	49.3%
9	DTE Energy Company	BBB+	Baa2	39.6%	42.3%
10	Duke Energy Corporation	BBB+	Baa1	40.5%	44.1%
11	Entergy Corporation	BBB+	Baa2	33.4%	37.1%
12	Eversource Energy	A-	Baa1	44.4%	46.6%
13	NorthWestern Corporation	BBB	Baa2	47.5%	47.5%
14	Public Service Enterprise Group Incorporated	BBB+	Baa1	47.7%	52.3%
15	Sempra Energy	BBB+	Baa2	36.6%	43.4%
16	Southern Company	A-	Baa2	34.1%	39.5%
17	WEC Energy Group, Inc.	A-	Baa1	43.9%	47.4%
18	Xcel Energy Inc.	A-	Baa1	39.2%	43.2%
19	**Average**	**BBB+**	**Baa1**	**42.9%**	**46.8%**
20	**Median**			**43.7%**	**46.9%**
21	**Kentucky Utilities Company and Louisville Gas and Electric Company**	**A-[3]**	**A3[3]**	**53.1%[4]**	

Sources:

[1] S&P Global Market Intelligence, Downloaded on February 1, 2021.

[2] *The Value Line Investment Survey*, November 13, December 11, 2020, and January 22, 2021.

[3] McKenzie direct at 15.

[4] Schedule J-1.

Exhibit CCW-4

Consensus Analysts' Growth Rates

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Consensus Analysts' Growth Rates

		Zacks		MI		Yahoo! Finance		Average of
Line	Company	Estimated Growth %[1] (1)	Number of Estimates (2)	Estimated Growth %[2] (3)	Number of Estimates (4)	Estimated Growth %[3] (5)	Number of Estimates (6)	Growth Rates (7)
1	ALLETE, Inc.	N/A	N/A	5.33%	3	7.00%	N/A	6.17%
2	Alliant Energy Corporation	5.90%	N/A	5.95%	3	5.80%	N/A	5.88%
3	Ameren Corporation	6.80%	N/A	6.66%	7	6.60%	N/A	6.69%
4	Avangrid, Inc.	4.70%	N/A	7.62%	4	3.40%	N/A	5.24%
5	Avista Corporation	5.40%	N/A	5.01%	3	5.40%	N/A	5.27%
6	Black Hills Corporation	5.80%	N/A	5.45%	4	4.72%	N/A	5.32%
7	CMS Energy Corporation	7.00%	N/A	6.89%	7	7.23%	N/A	7.04%
8	Consolidated Edison, Inc.	2.00%	N/A	3.20%	4	2.56%	N/A	2.59%
9	DTE Energy Company	5.70%	N/A	6.08%	9	6.03%	N/A	5.94%
10	Duke Energy Corporation	3.60%	N/A	4.14%	5	2.36%	N/A	3.37%
11	Entergy Corporation	5.40%	N/A	5.58%	4	5.35%	N/A	5.44%
12	Eversource Energy	6.50%	N/A	6.59%	9	6.51%	N/A	6.53%
13	NorthWestern Corporation	3.40%	N/A	3.67%	4	2.70%	N/A	3.26%
14	Public Service Enterprise Group Incorporated	3.00%	N/A	4.43%	4	1.15%	N/A	2.86%
15	Sempra Energy	7.30%	N/A	6.76%	6	7.70%	N/A	7.25%
16	Southern Company	5.00%	N/A	5.56%	5	4.36%	N/A	4.97%
17	WEC Energy Group, Inc.	6.10%	N/A	5.88%	3	6.10%	N/A	6.03%
18	Xcel Energy Inc.	6.10%	N/A	5.34%	5	6.20%	N/A	5.88%
19	**Average**	**5.28%**	**N/A**	**5.56%**	**5**	**5.07%**	**N/A**	**5.32%**
20	**Median**							**5.66%**

Sources:

[1] Zacks, http://www.zacks.com/, downloaded on January 22, 2021.

[2] S&P Global Market Intelligence, https://platform.mi.spglobal.com, downloaded on January 22, 2021.

[3] Yahoo! Finance, http://www.finance.yahoo.com/, downloaded on January 22, 2021.

Note:

Yahoo! Finance next year number of estimates.

Exhibit CCW-5

Constant Growth DCF Model
(Consensus Analysts' Growth Rates)

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric

Constant Growth DCF Model
(Consensus Analysts' Growth Rates)

Line	Company	13-Week AVG Stock Price[1] (1)	Analysts' Growth[2] (2)	Annualized Dividend[3] (3)	Adjusted Yield (4)	Constant Growth DCF (5)
1	ALLETE, Inc.	$59.59	6.17%	$2.47	4.40%	10.57%
2	Alliant Energy Corporation	$52.43	5.88%	$1.52	3.07%	8.95%
3	Ameren Corporation	$78.57	6.69%	$2.06	2.80%	9.48%
4	Avangrid, Inc.	$47.11	5.24%	$1.76	3.93%	9.17%
5	Avista Corporation	$38.02	5.27%	$1.62	4.49%	9.76%
6	Black Hills Corporation	$60.62	5.32%	$2.26	3.93%	9.25%
7	CMS Energy Corporation	$61.02	7.04%	$1.63	2.86%	9.90%
8	Consolidated Edison, Inc.	$74.79	2.59%	$3.06	4.20%	6.78%
9	DTE Energy Company	$124.55	5.94%	$4.34	3.69%	9.63%
10	Duke Energy Corporation	$92.12	3.37%	$3.86	4.33%	7.70%
11	Entergy Corporation	$102.70	5.44%	$3.80	3.90%	9.35%
12	Eversource Energy	$88.12	6.53%	$2.27	2.74%	9.28%
13	NorthWestern Corporation	$57.05	3.26%	$2.40	4.34%	7.60%
14	Public Service Enterprise Group Incorporated	$58.21	2.86%	$1.96	3.46%	6.32%
15	Sempra Energy	$127.91	7.25%	$4.18	3.50%	10.76%
16	Southern Company	$60.68	4.97%	$2.56	4.43%	9.40%
17	WEC Energy Group, Inc.	$94.47	6.03%	$2.53	2.84%	8.87%
18	Xcel Energy Inc.	$67.94	5.88%	$1.72	2.68%	8.56%
19	**Average**	**$74.77**	**5.32%**	**$2.56**	**3.64%**	**8.96%**
20	**Median**					**9.26%**

Sources:

[1] S&P Global Market Intelligence, Downloaded on February 1, 2021.

[2] Exhibit CCW-4.

[3] *The Value Line Investment Survey*, November 13, December 11, 2020, and January 22, 2021.

Exhibit CCW-6

Payout Ratios

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Payout Ratios

Line	Company	Dividends Per Share		Earnings Per Share		Payout Ratio	
		2019 (1)	Projected (2)	2019 (3)	Projected (4)	2019 (5)	Projected (6)
1	ALLETE, Inc.	$2.35	$2.80	$3.33	$4.25	70.57%	65.88%
2	Alliant Energy Corporation	$1.42	$1.96	$2.33	$3.00	60.94%	65.33%
3	Ameren Corporation	$1.92	$2.45	$3.35	$4.50	57.31%	54.44%
4	Avangrid, Inc.	$1.76	$1.80	$2.26	$2.50	77.88%	72.00%
5	Avista Corporation	$1.55	$1.90	$2.97	$2.50	52.19%	76.00%
6	Black Hills Corporation	$2.05	$2.75	$3.53	$4.25	58.07%	64.71%
7	CMS Energy Corporation	$1.53	$2.15	$2.39	$3.50	64.02%	61.43%
8	Consolidated Edison, Inc.	$2.96	$3.50	$4.08	$5.00	72.55%	70.00%
9	DTE Energy Company	$3.85	$5.20	$6.31	$8.50	61.01%	61.18%
10	Duke Energy Corporation	$3.75	$4.15	$5.07	$6.00	73.96%	69.17%
11	Entergy Corporation	$3.66	$4.55	$6.30	$7.00	58.10%	65.00%
12	Eversource Energy	$2.14	$2.85	$3.45	$4.50	62.03%	63.33%
13	NorthWestern Corporation	$2.30	$2.75	$3.53	$4.00	65.16%	68.75%
14	Public Service Enterprise Group Incorporated	$1.88	$2.30	$3.90	$4.25	48.21%	54.12%
15	Sempra Energy	$3.87	$5.60	$5.97	$10.00	64.82%	56.00%
16	Southern Company	$2.46	$2.86	$3.17	$3.75	77.60%	76.27%
17	WEC Energy Group, Inc.	$2.36	$3.20	$3.58	$4.75	65.92%	67.37%
18	Xcel Energy Inc.	$1.62	$2.15	$2.64	$3.50	61.36%	61.43%
19	**Average**	**$2.41**	**$3.05**	**$3.79**	**$4.76**	**63.98%**	**65.13%**

Source:
The Value Line Investment Survey, November 13, December 11, 2020, and January 22, 2021.

Exhibit CCW-7

Sustainable Growth Rate

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Sustainable Growth Rate

					3 to 5 Year Projections							Sustainable
Line	Company	Dividends Per Share (1)	Earnings Per Share (2)	Book Value Per Share (3)	Book Value Growth (4)	ROE (5)	Adjustment Factor (6)	Adjusted ROE (7)	Payout Ratio (8)	Retention Rate (9)	Internal Growth Rate (10)	Growth Rate (11)
1	ALLETE, Inc.	$2.80	$4.25	$51.25	3.49%	8.29%	1.02	8.43%	65.88%	34.12%	2.88%	3.25%
2	Alliant Energy Corporation	$1.96	$3.00	$28.45	6.02%	10.54%	1.03	10.85%	65.33%	34.67%	3.76%	6.08%
3	Ameren Corporation	$2.45	$4.50	$44.50	6.34%	10.11%	1.03	10.42%	54.44%	45.56%	4.75%	7.36%
4	Avangrid, Inc.	$1.80	$2.50	$51.25	0.77%	4.88%	1.00	4.90%	72.00%	28.00%	1.37%	1.37%
5	Avista Corporation	$1.90	$2.50	$32.25	2.24%	7.75%	1.01	7.84%	76.00%	24.00%	1.88%	2.41%
6	Black Hills Corporation	$2.75	$4.25	$47.75	4.44%	8.90%	1.02	9.09%	64.71%	35.29%	3.21%	3.95%
7	CMS Energy Corporation	$2.15	$3.50	$25.75	7.81%	13.59%	1.04	14.10%	61.43%	38.57%	5.44%	8.17%
8	Consolidated Edison, Inc.	$3.50	$5.00	$62.50	2.92%	8.00%	1.01	8.12%	70.00%	30.00%	2.43%	3.14%
9	DTE Energy Company	$5.20	$8.50	$79.00	5.40%	10.76%	1.03	11.04%	61.18%	38.82%	4.29%	5.65%
10	Duke Energy Corporation	$4.15	$6.00	$69.00	2.43%	8.70%	1.01	8.80%	69.17%	30.83%	2.71%	3.41%
11	Entergy Corporation	$4.55	$7.00	$64.50	4.67%	10.85%	1.02	11.10%	65.00%	35.00%	3.89%	4.95%
12	Eversource Energy	$2.85	$4.50	$50.75	5.80%	8.87%	1.03	9.12%	63.33%	36.67%	3.34%	5.71%
13	NorthWestern Corporation	$2.75	$4.00	$45.75	2.51%	8.74%	1.01	8.85%	68.75%	31.25%	2.77%	3.17%
14	Public Service Enterprise Group Incorporated	$2.30	$4.25	$38.75	5.29%	10.97%	1.03	11.25%	54.12%	45.88%	5.16%	5.20%
15	Sempra Energy	$5.60	$10.00	$89.00	8.00%	11.24%	1.04	11.67%	56.00%	44.00%	5.13%	7.91%
16	Southern Company	$2.86	$3.75	$30.75	3.33%	12.20%	1.02	12.39%	76.27%	23.73%	2.94%	3.73%
17	WEC Energy Group, Inc.	$3.20	$4.75	$38.00	3.46%	12.50%	1.02	12.71%	67.37%	32.63%	4.15%	4.15%
18	Xcel Energy Inc.	$2.15	$3.50	$33.25	5.67%	10.53%	1.03	10.82%	61.43%	38.57%	4.17%	6.09%
19	**Average**	**$3.05**	**$4.76**	**$49.03**	**4.48%**	**9.86%**	**1.02**	**10.08%**	**65.13%**	**34.87%**	**3.57%**	**4.76%**
20	**Median**											**4.55%**

Sources and Notes:

Cols. (1), (2) and (3): *The Value Line Investment Survey* , November 13, December 11, 2020, and January 22, 2021.

Col. (4): [Col. (3) / Page 2 Col. (2)] ^ (1/number of years projected) - 1.

Col. (5): Col. (2) / Col. (3).

Col. (6): [2 * (1 + Col. (4))] / (2 + Col. (4)).

Col. (7): Col. (6) * Col. (5).

Col. (8): Col. (1) / Col. (2).

Col. (9): 1 - Col. (8).

Col. (10): Col. (9) * Col. (7).

Col. (11): Col. (10) + Page 2 Col. (9).

Kentucky Utilities Company and Louisville Gas and Electric Company

Sustainable Growth Rate

Line	Company	13-Week Average Stock Price[1] (1)	2019 Book Value Per Share[2] (2)	Market to Book Ratio (3)	Common Shares Outstanding (in Millions)[2] 2019 (4)	3-5 Years (5)	Growth (6)	S Factor[3] (7)	V Factor[4] (8)	S * V (9)
1	ALLETE, Inc.	$59.59	$43.17	1.38	51.70	54.25	0.97%	1.34%	27.55%	0.37%
2	Alliant Energy Corporation	$52.43	$21.24	2.47	245.02	265.00	1.58%	3.90%	59.49%	2.32%
3	Ameren Corporation	$78.57	$32.73	2.40	246.20	270.00	1.86%	4.47%	58.34%	2.61%
4	Avangrid, Inc.	$47.11	$49.31	0.96	309.01	309.00	- 0.00%	- 0.00%	- 4.66%	0.00%
5	Avista Corporation	$38.02	$28.87	1.32	67.18	73.00	1.68%	2.21%	24.07%	0.53%
6	Black Hills Corporation	$60.62	$38.42	1.58	61.48	65.50	1.27%	2.01%	36.62%	0.74%
7	CMS Energy Corporation	$61.02	$17.68	3.45	283.86	300.00	1.11%	3.84%	71.03%	2.73%
8	Consolidated Edison, Inc.	$74.79	$54.12	1.38	333.00	365.00	1.85%	2.56%	27.64%	0.71%
9	DTE Energy Company	$124.55	$60.73	2.05	192.21	205.00	1.30%	2.66%	51.24%	1.36%
10	Duke Energy Corporation	$92.12	$61.20	1.51	733.00	785.00	1.38%	2.08%	33.57%	0.70%
11	Entergy Corporation	$102.70	$51.34	2.00	199.15	210.00	1.07%	2.13%	50.01%	1.07%
12	Eversource Energy	$88.12	$38.29	2.30	329.88	361.00	1.82%	4.19%	56.55%	2.37%
13	NorthWestern Corporation	$57.05	$40.42	1.41	50.45	53.00	0.99%	1.40%	29.15%	0.41%
14	Public Service Enterprise Group Incorporated	$58.21	$29.94	1.94	504.00	505.00	0.04%	0.08%	48.57%	0.04%
15	Sempra Energy	$127.91	$60.58	2.11	291.71	330.00	2.50%	5.27%	52.64%	2.78%
16	Southern Company	$60.68	$26.11	2.32	1,053.30	1,085.00	0.59%	1.38%	56.97%	0.79%
17	WEC Energy Group, Inc.	$94.47	$32.06	2.95	315.43	315.43	0.00%	0.00%	66.06%	0.00%
18	Xcel Energy Inc.	$67.94	$25.24	2.69	524.54	555.00	1.14%	3.06%	62.85%	1.92%
19	**Average**	**$74.77**	**$39.53**	**2.01**	**321.73**	**339.23**	**1.24%**	**2.50%**	**47.78%**	**1.19%**

Sources and Notes:
[1] S&P Global Market Intelligence, Downloaded on February 1, 2021.
[2] *The Value Line Investment Survey*, November 13, December 11, 2020, and January 22, 2021.
[3] Expected Growth in the Number of Shares, Column (3) * Column (6).
[4] Expected Profit of Stock Investment, [1 - 1 / Column (3)].

Exhibit CCW-8

Constant Growth DCF Model
(Sustainable Growth Rate)

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Constant Growth DCF Model
(Sustainable Growth Rate)

Line	Company	13-Week AVG Stock Price[1] (1)	Sustainable Growth[2] (2)	Annualized Dividend[3] (3)	Adjusted Yield (4)	Constant Growth DCF (5)
1	ALLETE, Inc.	$59.59	3.25%	$2.47	4.28%	7.53%
2	Alliant Energy Corporation	$52.43	6.08%	$1.52	3.08%	9.16%
3	Ameren Corporation	$78.57	7.36%	$2.06	2.81%	10.17%
4	Avangrid, Inc.	$47.11	1.37%	$1.76	3.79%	5.16%
5	Avista Corporation	$38.02	2.41%	$1.62	4.36%	6.78%
6	Black Hills Corporation	$60.62	3.95%	$2.26	3.88%	7.82%
7	CMS Energy Corporation	$61.02	8.17%	$1.63	2.89%	11.06%
8	Consolidated Edison, Inc.	$74.79	3.14%	$3.06	4.22%	7.36%
9	DTE Energy Company	$124.55	5.65%	$4.34	3.68%	9.33%
10	Duke Energy Corporation	$92.12	3.41%	$3.86	4.33%	7.74%
11	Entergy Corporation	$102.70	4.95%	$3.80	3.88%	8.84%
12	Eversource Energy	$88.12	5.71%	$2.27	2.72%	8.43%
13	NorthWestern Corporation	$57.05	3.17%	$2.40	4.34%	7.51%
14	Public Service Enterprise Group Incorporated	$58.21	5.20%	$1.96	3.54%	8.74%
15	Sempra Energy	$127.91	7.91%	$4.18	3.53%	11.44%
16	Southern Company	$60.68	3.73%	$2.56	4.38%	8.11%
17	WEC Energy Group, Inc.	$94.47	4.15%	$2.53	2.79%	6.94%
18	Xcel Energy Inc.	$67.94	6.09%	$1.72	2.69%	8.78%
19	**Average**	**$74.77**	**4.76%**	**$2.56**	**3.62%**	**8.38%**
20	**Median**					**8.27%**

Sources:

[1] S&P Global Market Intelligence, Downloaded on February 1, 2021.

[2] Exhibit CCW-7, page 1.

[3] *The Value Line Investment Survey*, November 13, December 11, 2020, and January 22, 2021.
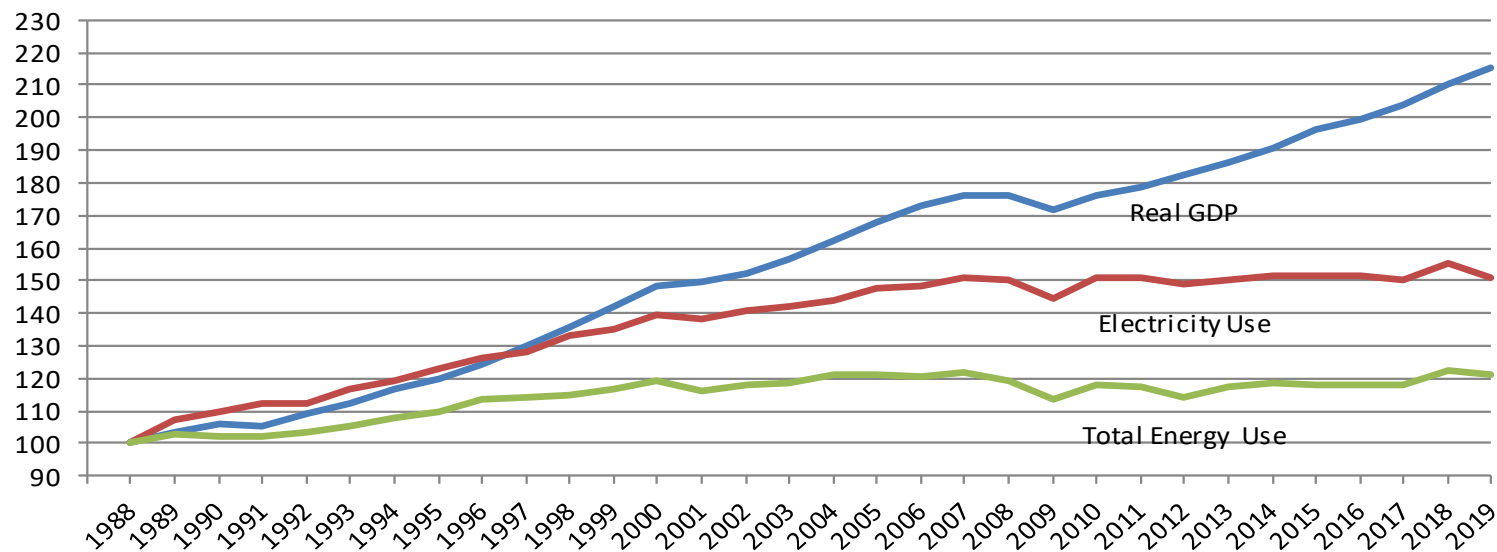
Exhibit CCW-9

Electricity Sales Are Linked to U.S. Economic Growth

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Electricity Sales Are Linked to U.S. Economic Growth

Note:
1988 represents the base year. Graph depicts increases or decreases from the base year.

Sources:
U.S. Energy Information Administration
Federal Reserve Bank of St. Louis

Exhibit CCW-10

Multi-Stage Growth DCF Model

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Multi-Stage Growth DCF Model

| Line | Company | 13-Week AVG Stock Price[1] (1) | Annualized Dividend[2] (2) | First Stage Growth[3] (3) | Second Stage Growth | | | | | Third Stage Growth[4] (9) | Multi-Stage Growth DCF (10) |
					Year 6 (4)	Year 7 (5)	Year 8 (6)	Year 9 (7)	Year 10 (8)		
1	ALLETE, Inc.	$59.59	$2.47	6.17%	5.86%	5.56%	5.26%	4.95%	4.65%	4.35%	9.18%
2	Alliant Energy Corporation	$52.43	$1.52	5.88%	5.63%	5.37%	5.11%	4.86%	4.60%	4.35%	7.68%
3	Ameren Corporation	$78.57	$2.06	6.69%	6.30%	5.91%	5.52%	5.13%	4.74%	4.35%	7.52%
4	Avangrid, Inc.	$47.11	$1.76	5.24%	5.09%	4.94%	4.79%	4.64%	4.49%	4.35%	8.47%
5	Avista Corporation	$38.02	$1.62	5.27%	5.12%	4.96%	4.81%	4.65%	4.50%	4.35%	9.05%
6	Black Hills Corporation	$60.62	$2.26	5.32%	5.16%	5.00%	4.83%	4.67%	4.51%	4.35%	8.48%
7	CMS Energy Corporation	$61.02	$1.63	7.04%	6.59%	6.14%	5.69%	5.24%	4.79%	4.35%	7.65%
8	Consolidated Edison, Inc.	$74.79	$3.06	2.59%	2.88%	3.17%	3.47%	3.76%	4.05%	4.35%	8.16%
9	DTE Energy Company	$124.55	$4.34	5.94%	5.67%	5.41%	5.14%	4.88%	4.61%	4.35%	8.36%
10	Duke Energy Corporation	$92.12	$3.86	3.37%	3.53%	3.69%	3.86%	4.02%	4.18%	4.35%	8.45%
11	Entergy Corporation	$102.70	$3.80	5.44%	5.26%	5.08%	4.89%	4.71%	4.53%	4.35%	8.48%
12	Eversource Energy	$88.12	$2.27	6.53%	6.17%	5.80%	5.44%	5.07%	4.71%	4.35%	7.43%
13	NorthWestern Corporation	$57.05	$2.40	3.26%	3.44%	3.62%	3.80%	3.98%	4.16%	4.35%	8.44%
14	Public Service Enterprise Group Incorporate	$58.21	$1.96	2.86%	3.11%	3.36%	3.60%	3.85%	4.10%	4.35%	7.53%
15	Sempra Energy	$127.91	$4.18	7.25%	6.77%	6.28%	5.80%	5.31%	4.83%	4.35%	8.44%
16	Southern Company	$60.68	$2.56	4.97%	4.87%	4.76%	4.66%	4.56%	4.45%	4.35%	8.92%
17	WEC Energy Group, Inc.	$94.47	$2.53	6.03%	5.75%	5.47%	5.19%	4.91%	4.63%	4.35%	7.45%
18	Xcel Energy Inc.	$67.94	$1.72	5.88%	5.63%	5.37%	5.11%	4.86%	4.60%	4.35%	7.25%
19	**Average**	**$74.77**	**$2.56**	**5.32%**	**5.16%**	**4.99%**	**4.83%**	**4.67%**	**4.51%**	**4.35%**	**8.17%**
20	**Median**										**8.40%**

Sources:
[1] S&P Global Market Intelligence, Downloaded on February 1, 2021.
[2] *The Value Line Investment Survey*, November 13, December 11, 2020, and January 22, 2021.
[3] Exhibit CCW-4.
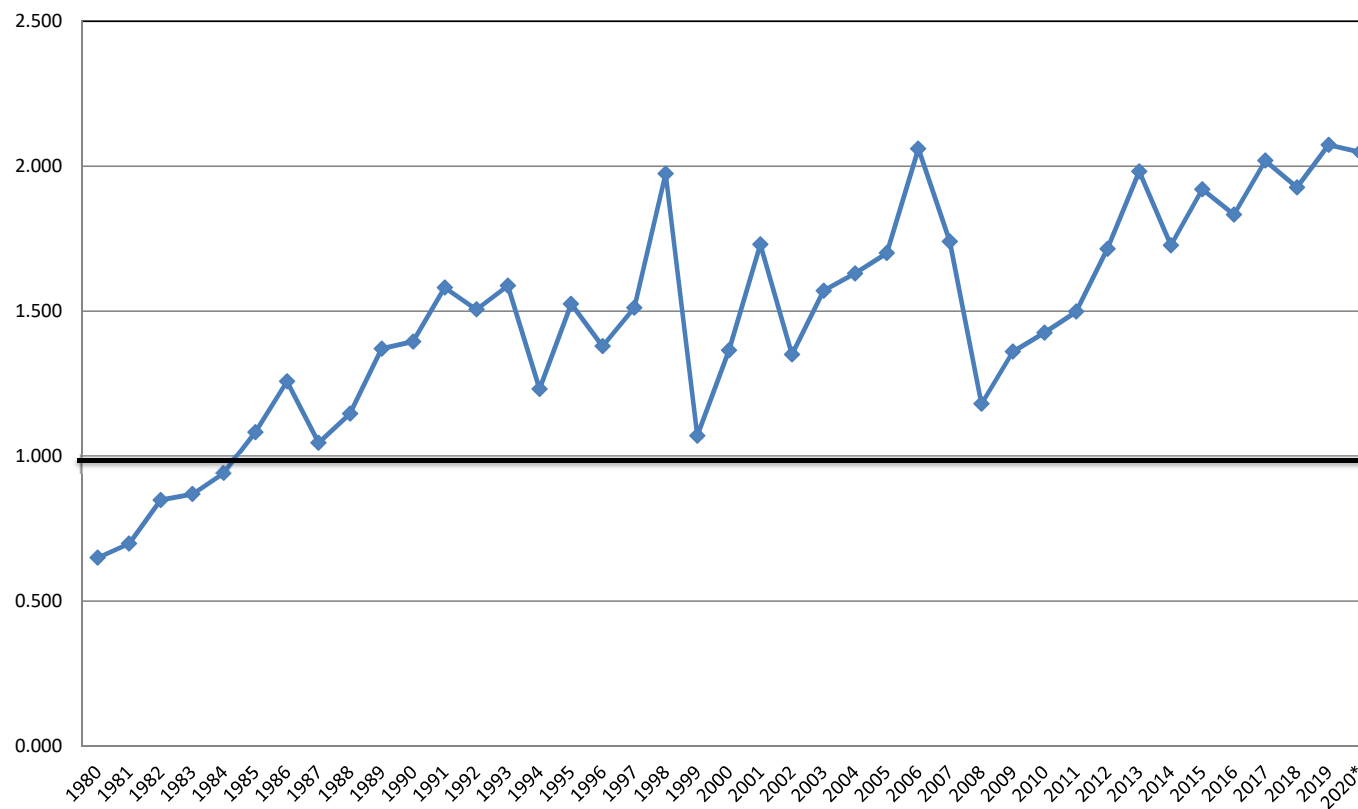[4] *Blue Chip Financial Forecasts*, December 1, 2020 at 14.

Exhibit CCW-11

Common Stock Market/Book Ratio

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Common Stock Market/Book Ratio

Source:

1980 - 2000: Mergent Public Utility Manual.

2001 - 2015: AUS Utility Reports, multiple dates.

2016 - 2019: Value Line Investment Survey, multiple dates.

* Value Line Investment Survey Reports, November 13, November 27, December 11, 2020, and January 22, 2021.

Exhibit CCW-12

Equity Risk Premium – Treasury Bond

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Equity Risk Premium - Treasury Bond

Line	Year	Authorized Electric Returns[1] (1)	30 yr. Treasury Bond Yield[2] (2)	Indicated Risk Premium (3)	Rolling 5 - Year Average (4)	Rolling 10 - Year Average (5)
1	1986	13.93%	7.80%	6.13%		
2	1987	12.99%	8.58%	4.41%		
3	1988	12.79%	8.96%	3.83%		
4	1989	12.97%	8.45%	4.52%		
5	1990	12.70%	8.61%	4.09%	4.60%	
6	1991	12.55%	8.14%	4.41%	4.25%	
7	1992	12.09%	7.67%	4.42%	4.26%	
8	1993	11.41%	6.60%	4.81%	4.45%	
9	1994	11.34%	7.37%	3.97%	4.34%	
10	1995	11.55%	6.88%	4.67%	4.46%	4.53%
11	1996	11.39%	6.70%	4.69%	4.51%	4.38%
12	1997	11.40%	6.61%	4.79%	4.59%	4.42%
13	1998	11.66%	5.58%	6.08%	4.84%	4.65%
14	1999	10.77%	5.87%	4.90%	5.03%	4.68%
15	2000	11.43%	5.94%	5.49%	5.19%	4.82%
16	2001	11.09%	5.49%	5.60%	5.37%	4.94%
17	2002	11.16%	5.43%	5.73%	5.56%	5.07%
18	2003	10.97%	4.96%	6.01%	5.55%	5.19%
19	2004	10.75%	5.05%	5.70%	5.71%	5.37%
20	2005	10.54%	4.65%	5.89%	5.79%	5.49%
21	2006	10.34%	4.87%	5.47%	5.76%	5.57%
22	2007	10.31%	4.83%	5.48%	5.71%	5.64%
23	2008	10.37%	4.28%	6.09%	5.73%	5.64%
24	2009	10.52%	4.07%	6.45%	5.88%	5.79%
25	2010	10.29%	4.25%	6.04%	5.90%	5.85%
26	2011	10.19%	3.91%	6.28%	6.07%	5.91%
27	2012	10.01%	2.92%	7.09%	6.39%	6.05%
28	2013	9.81%	3.45%	6.36%	6.44%	6.09%
29	2014	9.75%	3.34%	6.41%	6.44%	6.16%
30	2015	9.60%	2.84%	6.76%	6.58%	6.24%
31	2016	9.60%	2.60%	7.00%	6.72%	6.40%
32	2017	9.68%	2.90%	6.79%	6.66%	6.53%
33	2018	9.55%	3.11%	6.44%	6.68%	6.56%
34	2019	9.64%	2.58%	7.06%	6.81%	6.62%
35	2020 [3]	9.39%	1.56%	7.83%	7.02%	6.80%
36	**Average**	**10.99%**	**5.34%**	**5.65%**	**5.59%**	**5.59%**
37	**Minimum**				**4.25%**	**4.38%**
38	**Maximum**				**7.02%**	**6.80%**

Sources:

[1] *Regulatory Research Associates, Inc*., Regulatory Focus, Major Rate Case Decisions, Jan. 1997 p. 5, and Jan. 2011 p. 3.
S&P Global Market Intelligence, RRA Regulatory Focus, Major Rate Case Decisions, January - December 2020, February 2, 2021, p. 1.
2006 - 2019 Authorized Returns exclude limited issue rider cases.

[2] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.
The yields from 2002 to 2005 represent the 20-Year Treasury yields obtained from the Federal Reserve Bank.

[3] Data represents January - December, 2020.

Exhibit CCW-13

Equity Risk Premium – Utility Bond

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Equity Risk Premium - Utility Bond

Line	Year	Authorized Electric Returns[1] (1)	Average "A" Rated Utility Bond Yield[2] (2)	Indicated Risk Premium (3)	Rolling 5 - Year Average (4)	Rolling 10 - Year Average (5)
1	1986	13.93%	9.58%	4.35%		
2	1987	12.99%	10.10%	2.89%		
3	1988	12.79%	10.49%	2.30%		
4	1989	12.97%	9.77%	3.20%		
5	1990	12.70%	9.86%	2.84%	3.12%	
6	1991	12.55%	9.36%	3.19%	2.88%	
7	1992	12.09%	8.69%	3.40%	2.99%	
8	1993	11.41%	7.59%	3.82%	3.29%	
9	1994	11.34%	8.31%	3.03%	3.26%	
10	1995	11.55%	7.89%	3.66%	3.42%	3.27%
11	1996	11.39%	7.75%	3.64%	3.51%	3.20%
12	1997	11.40%	7.60%	3.80%	3.59%	3.29%
13	1998	11.66%	7.04%	4.62%	3.75%	3.52%
14	1999	10.77%	7.62%	3.15%	3.77%	3.52%
15	2000	11.43%	8.24%	3.19%	3.68%	3.55%
16	2001	11.09%	7.76%	3.33%	3.62%	3.56%
17	2002	11.16%	7.37%	3.79%	3.61%	3.60%
18	2003	10.97%	6.58%	4.39%	3.57%	3.66%
19	2004	10.75%	6.16%	4.59%	3.86%	3.82%
20	2005	10.54%	5.65%	4.89%	4.20%	3.94%
21	2006	10.34%	6.07%	4.27%	4.39%	4.00%
22	2007	10.31%	6.07%	4.24%	4.48%	4.04%
23	2008	10.37%	6.53%	3.84%	4.37%	3.97%
24	2009	10.52%	6.04%	4.48%	4.34%	4.10%
25	2010	10.29%	5.47%	4.82%	4.33%	4.26%
26	2011	10.19%	5.04%	5.15%	4.51%	4.45%
27	2012	10.01%	4.13%	5.88%	4.83%	4.66%
28	2013	9.81%	4.48%	5.33%	5.13%	4.75%
29	2014	9.75%	4.28%	5.47%	5.33%	4.84%
30	2015	9.60%	4.12%	5.48%	5.46%	4.90%
31	2016	9.60%	3.93%	5.67%	5.57%	5.04%
32	2017	9.68%	4.00%	5.68%	5.53%	5.18%
33	2018	9.55%	4.25%	5.30%	5.52%	5.33%
34	2019	9.64%	3.77%	5.87%	5.60%	5.47%
35	2020 [3]	9.39%	3.05%	6.34%	5.77%	5.62%
36	**Average**	**10.99%**	**6.70%**	**4.28%**	**4.23%**	**4.21%**
37	**Minimum**				**2.88%**	**3.20%**
38	**Maximum**				**5.77%**	**5.62%**

Sources:

[1] *Regulatory Research Associates, Inc*., Regulatory Focus, Major Rate Case Decisions, Jan. 1997 p. 5, and Jan. 2011 p. 3.
S&P Global Market Intelligence, RRA Regulatory Focus, Major Rate Case Decisions, January - December 2020,
February 2, 2021, p. 1.
2006 - 2019 Authorized Returns exclude limited issue rider cases.

[2] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.
The yields from 2002 to 2005 represent the 20-Year Treasury yields obtained from the Federal Reserve Bank.

[3] Data represents January - December, 2020.
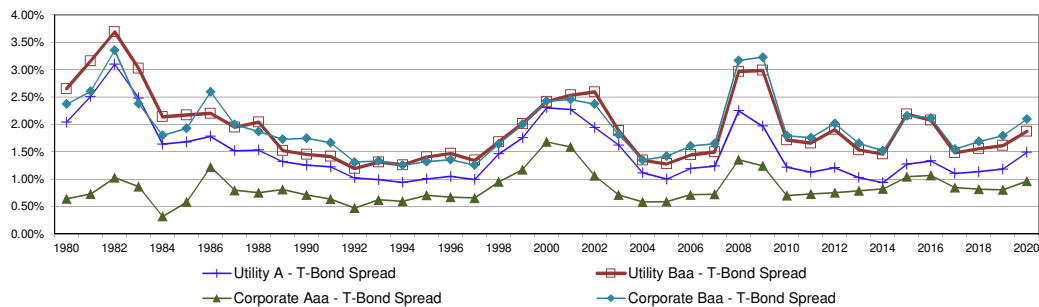
Exhibit CCW-14

Bond Yield Spreads

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Bond Yield Spreads

		T-Bond	Public Utility Bond				Corporate Bond				Utility to Corporate	
					A-T-Bond	Baa-T-Bond			Aaa-T-Bond	Baa-T-Bond	Baa	A-Aaa
Line	Year	Yield[1]	A[2]	Baa[2]	Spread	Spread	Aaa[3]	Baa[3]	Spread	Spread	Spread	Spread
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	1980	11.30%	13.34%	13.95%	2.04%	2.65%	11.94%	13.67%	0.64%	2.37%	0.28%	1.40%
2	1981	13.44%	15.95%	16.60%	2.51%	3.16%	14.17%	16.04%	0.73%	2.60%	0.56%	1.78%
3	1982	12.76%	15.86%	16.45%	3.10%	3.69%	13.79%	16.11%	1.03%	3.35%	0.34%	2.07%
4	1983	11.18%	13.66%	14.20%	2.48%	3.02%	12.04%	13.55%	0.86%	2.38%	0.65%	1.62%
5	1984	12.39%	14.03%	14.53%	1.64%	2.14%	12.71%	14.19%	0.32%	1.80%	0.34%	1.32%
6	1985	10.79%	12.47%	12.96%	1.68%	2.17%	11.37%	12.72%	0.58%	1.93%	0.24%	1.10%
7	1986	7.80%	9.58%	10.00%	1.78%	2.20%	9.02%	10.39%	1.22%	2.59%	-0.39%	0.56%
8	1987	8.58%	10.10%	10.53%	1.52%	1.95%	9.38%	10.58%	0.80%	2.00%	-0.05%	0.72%
9	1988	8.96%	10.49%	11.00%	1.53%	2.04%	9.71%	10.83%	0.75%	1.87%	0.17%	0.78%
10	1989	8.45%	9.77%	9.97%	1.32%	1.52%	9.26%	10.18%	0.81%	1.73%	-0.21%	0.51%
11	1990	8.61%	9.86%	10.06%	1.25%	1.45%	9.32%	10.36%	0.71%	1.75%	-0.30%	0.54%
12	1991	8.14%	9.36%	9.55%	1.22%	1.41%	8.77%	9.80%	0.63%	1.67%	-0.25%	0.59%
13	1992	7.67%	8.69%	8.86%	1.02%	1.19%	8.14%	8.98%	0.47%	1.31%	-0.12%	0.55%
14	1993	6.60%	7.59%	7.91%	0.99%	1.31%	7.22%	7.93%	0.62%	1.33%	-0.02%	0.37%
15	1994	7.37%	8.31%	8.63%	0.94%	1.26%	7.96%	8.62%	0.59%	1.25%	0.01%	0.35%
16	1995	6.88%	7.89%	8.29%	1.01%	1.41%	7.59%	8.20%	0.71%	1.32%	0.09%	0.30%
17	1996	6.70%	7.75%	8.17%	1.05%	1.47%	7.37%	8.05%	0.67%	1.35%	0.12%	0.38%
18	1997	6.61%	7.60%	7.95%	0.99%	1.34%	7.26%	7.86%	0.66%	1.26%	0.09%	0.34%
19	1998	5.58%	7.04%	7.26%	1.46%	1.68%	6.53%	7.22%	0.95%	1.64%	0.04%	0.51%
20	1999	5.87%	7.62%	7.88%	1.75%	2.01%	7.04%	7.87%	1.18%	2.01%	0.01%	0.58%
21	2000	5.94%	8.24%	8.36%	2.30%	2.42%	7.62%	8.36%	1.68%	2.42%	-0.01%	0.62%
22	2001	5.49%	7.76%	8.03%	2.27%	2.54%	7.08%	7.95%	1.59%	2.45%	0.08%	0.68%
23	2002	5.43%	7.37%	8.02%	1.94%	2.59%	6.49%	7.80%	1.06%	2.37%	0.22%	0.88%
24	2003	4.96%	6.58%	6.84%	1.62%	1.89%	5.67%	6.77%	0.71%	1.81%	0.08%	0.91%
25	2004	5.05%	6.16%	6.40%	1.11%	1.35%	5.63%	6.39%	0.58%	1.35%	0.00%	0.53%
26	2005	4.65%	5.65%	5.93%	1.00%	1.28%	5.24%	6.06%	0.59%	1.42%	-0.14%	0.41%
27	2006	4.87%	6.07%	6.32%	1.20%	1.44%	5.59%	6.48%	0.71%	1.61%	-0.16%	0.48%
28	2007	4.83%	6.07%	6.33%	1.24%	1.50%	5.56%	6.48%	0.72%	1.65%	-0.15%	0.52%
29	2008	4.28%	6.53%	7.25%	2.25%	2.97%	5.63%	7.45%	1.35%	3.17%	-0.20%	0.90%
30	2009	4.07%	6.04%	7.06%	1.97%	2.99%	5.31%	7.30%	1.24%	3.23%	-0.24%	0.73%
31	2010	4.25%	5.47%	5.96%	1.22%	1.71%	4.95%	6.04%	0.70%	1.79%	-0.08%	0.52%
32	2011	3.91%	5.04%	5.57%	1.13%	1.66%	4.64%	5.67%	0.73%	1.76%	-0.10%	0.40%
33	2012	2.92%	4.13%	4.83%	1.21%	1.90%	3.67%	4.94%	0.75%	2.02%	-0.11%	0.46%
34	2013	3.45%	4.48%	4.98%	1.03%	1.53%	4.24%	5.10%	0.79%	1.65%	-0.12%	0.24%
35	2014	3.34%	4.28%	4.80%	0.94%	1.46%	4.16%	4.86%	0.82%	1.52%	-0.06%	0.12%
36	2015	2.84%	4.12%	5.03%	1.27%	2.19%	3.89%	5.00%	1.05%	2.16%	0.03%	0.23%
37	2016	2.60%	3.93%	4.67%	1.33%	2.08%	3.66%	4.71%	1.07%	2.12%	-0.04%	0.27%
38	2017	2.90%	4.00%	4.38%	1.10%	1.48%	3.74%	4.44%	0.85%	1.55%	-0.06%	0.26%
39	2018	3.11%	4.25%	4.67%	1.14%	1.56%	3.93%	4.80%	0.82%	1.69%	-0.13%	0.32%
40	2019	2.58%	3.77%	4.19%	1.18%	1.61%	3.39%	4.38%	0.81%	1.79%	-0.18%	0.38%
41	2020 [4]	1.56%	3.05%	3.44%	1.49%	1.87%	2.53%	3.66%	0.96%	2.10%	-0.22%	0.53%
42	**Average**	**6.31%**	**7.80%**	**8.24%**	**1.49%**	**1.93%**	**7.15%**	**8.24%**	**0.84%**	**1.93%**	**0.00%**	**0.65%**

Yield Spreads
Treasury Vs. Corporate & Treasury Vs. Utility

Legend: Utility A - T-Bond Spread; Utility Baa - T-Bond Spread; Corporate Aaa - T-Bond Spread; Corporate Baa - T-Bond Spread

Sources:

[1] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.

[2] The utility yields for the period 1980-2000 were obtained from Mergent Public Utility Manual, Mergent Weekly News Reports, 2003.
The utility yields for the period 2001-2009 were obtained from the Mergent Bond Record.
The utility yields for the period 2010-2019 were obtained from http://credittrends.moodys.com/.

[3] The corporate yields for the period 1980-2009 were obtained from the St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/.
The corporate yields from 2010-2019 were obtained from http://credittrends.moodys.com/.

[4] Data represents January - December, 2020.

Exhibit CCW-15

Treasury and Utility Bond Yields

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Treasury and Utility Bond Yields

Line	Date	Treasury Bond Yield[1] (1)	"A" Rated Utility Bond Yield[2] (2)	"Baa" Rated Utility Bond Yield[2] (3)
1	01/22/21	1.85%	2.92%	3.18%
2	01/15/21	1.85%	2.93%	3.20%
3	01/08/21	1.87%	2.96%	3.24%
4	12/31/20	1.65%	2.74%	3.00%
5	12/24/20	1.66%	2.77%	3.07%
6	12/18/20	1.70%	2.81%	3.08%
7	12/11/20	1.63%	2.72%	3.00%
8	12/04/20	1.73%	2.83%	3.09%
9	11/27/20	1.57%	2.74%	3.03%
10	11/20/20	1.53%	2.72%	3.08%
11	11/13/20	1.65%	2.89%	3.21%
12	11/06/20	1.60%	2.89%	3.21%
13	10/30/20	1.65%	2.99%	3.35%
14	**Average**	**1.69%**	**2.84%**	**3.13%**
15	**Spread To Treasury**		**1.15%**	**1.44%**

Sources:

[1] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.

[2] http://credittrends.moodys.com/.

Kentucky Utilities Company and Louisville Gas and Electric Company

Treasury and Utility Bond Yields

Line	Date	Treasury Bond Yield[1] (1)	"A" Rated Utility Bond Yield[2] (2)	"Baa" Rated Utility Bond Yield[2] (3)
1	01/22/21	1.85%	2.92%	3.18%
2	01/15/21	1.85%	2.93%	3.20%
3	01/08/21	1.87%	2.96%	3.24%
4	12/31/20	1.65%	2.74%	3.00%
5	12/24/20	1.66%	2.77%	3.07%
6	12/18/20	1.70%	2.81%	3.08%
7	12/11/20	1.63%	2.72%	3.00%
8	12/04/20	1.73%	2.83%	3.09%
9	11/27/20	1.57%	2.74%	3.03%
10	11/20/20	1.53%	2.72%	3.08%
11	11/13/20	1.65%	2.89%	3.21%
12	11/06/20	1.60%	2.89%	3.21%
13	10/30/20	1.65%	2.99%	3.35%
14	10/23/20	1.64%	2.98%	3.28%
15	10/16/20	1.52%	2.90%	3.24%
16	10/09/20	1.58%	2.97%	3.30%
17	10/02/20	1.48%	2.93%	3.28%
18	09/25/20	1.40%	2.86%	3.19%
19	09/18/20	1.45%	2.86%	3.18%
20	09/11/20	1.42%	2.83%	3.16%
21	09/04/20	1.46%	2.87%	3.19%
22	08/28/20	1.52%	2.92%	3.24%
23	08/21/20	1.35%	2.74%	3.06%
24	08/14/20	1.45%	2.79%	3.11%
25	08/07/20	1.23%	2.59%	2.93%
26	07/31/20	1.20%	2.56%	2.93%
27	**Average**	**1.56%**	**2.84%**	**3.15%**
28	**Spread To Treasury**		**1.28%**	**1.59%**

Sources:

[1] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.

[2] http://credittrends.moodys.com/.

Kentucky Utilities Company and Louisville Gas and Electric Company

Trends in Bond Yields
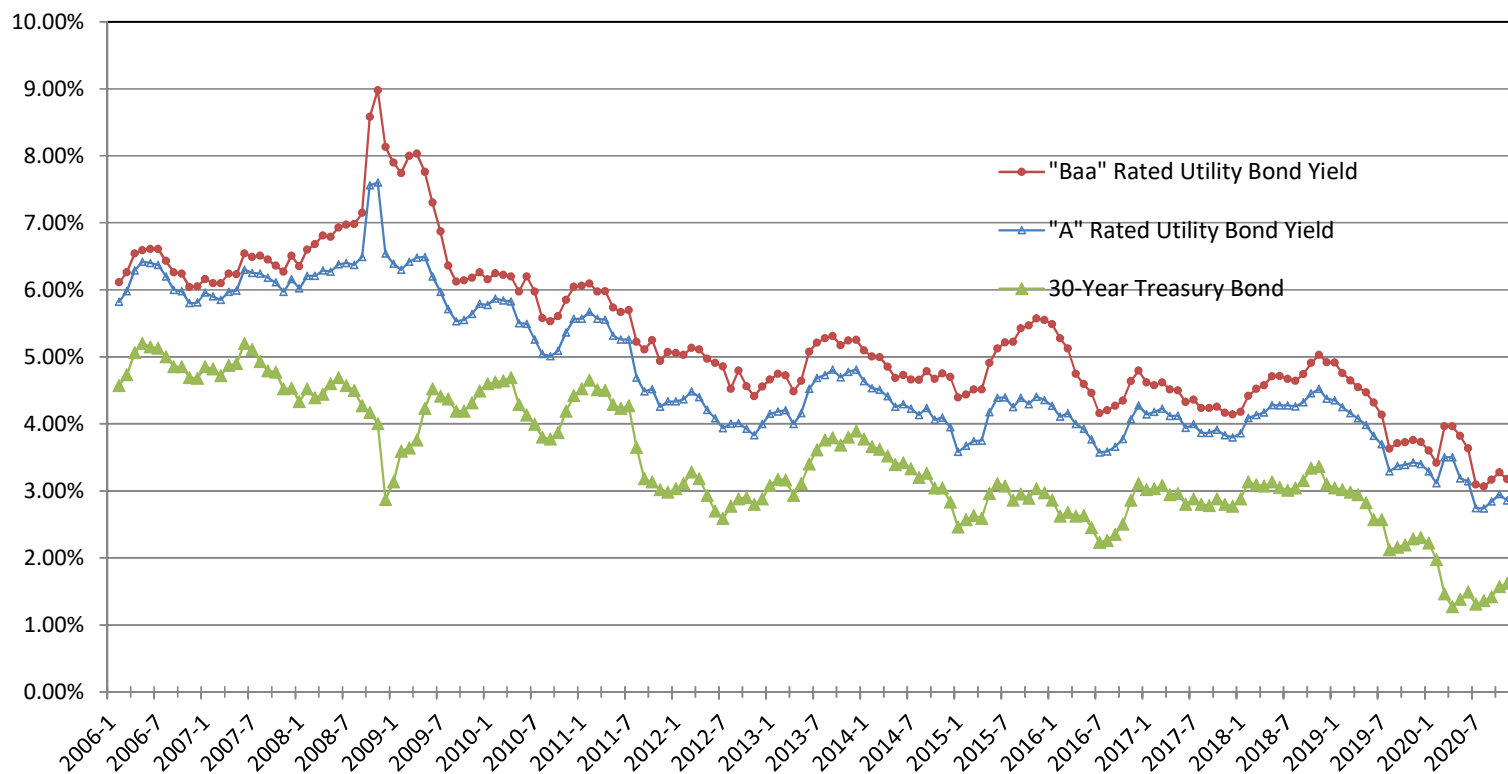
Sources:
Mergent Bond Record.
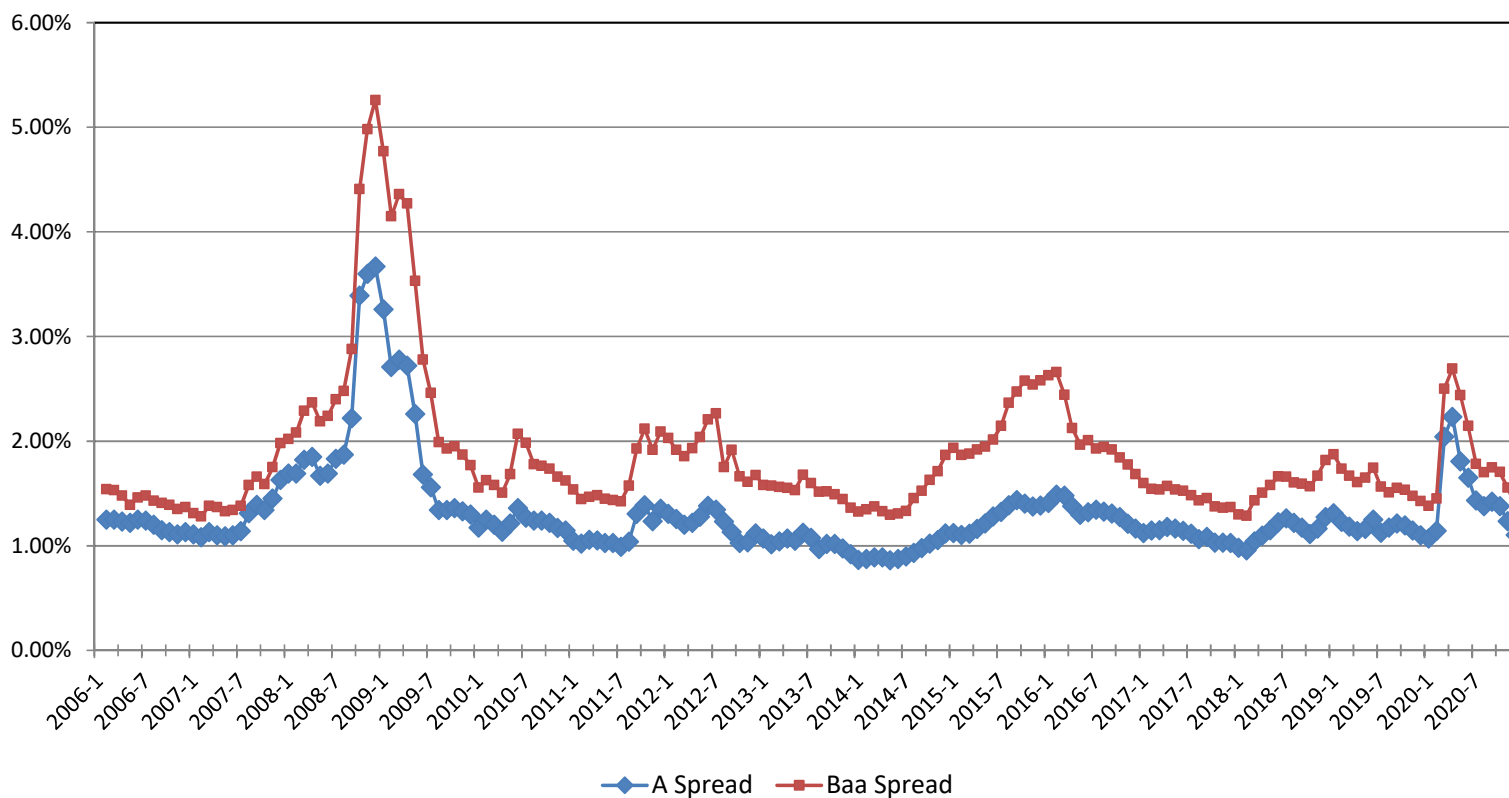www.moodys.com, Bond Yields and Key Indicators.
St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/

Kentucky Utilities Company and Louisville Gas and Electric Company

Yield Spread Between Utility Bonds and 30-Year Treasury Bonds

Sources:
Mergent Bond Record.
www.moodys.com, Bond Yields and Key Indicators.
St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/

Exhibit CCW-16

Value Line Beta

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

Value Line Beta

Line	Company	Beta[1]	S&P Global Market Intelligence Beta[2]
1	ALLETE, Inc.	0.85	0.69
2	Alliant Energy Corporation	0.85	0.65
3	Ameren Corporation	0.85	0.61
4	Avangrid, Inc.	0.85	0.55
5	Avista Corporation	0.95	0.66
6	Black Hills Corporation	1.00	0.72
7	CMS Energy Corporation	0.80	0.62
8	Consolidated Edison, Inc.	0.75	0.53
9	DTE Energy Company	0.95	0.67
10	Duke Energy Corporation	0.85	0.62
11	Entergy Corporation	0.95	0.71
12	Eversource Energy	0.90	0.68
13	NorthWestern Corporation	0.95	0.75
14	Public Service Enterprise Group Incorporated	0.90	0.69
15	Sempra Energy	1.00	0.67
16	Southern Company	0.90	0.67
17	WEC Energy Group, Inc.	0.80	0.61
18	Xcel Energy Inc.	0.80	0.64
19	**Average**	**0.88**	**0.65**
20	**Median**	**0.88**	**0.66**
21	**Historical Beta[3]**	**0.66**	

Source:

[1] *The Value Line Investment Survey,*
November 13, December 11, 2020, and January 22, 2021.

[2] S&P Global Market Intelligence, betas for the period 1/22/2016 - 1/22/2021.

[3] Exhibit CCW-16, page 2.

Kentucky Utilities Company and Louisville Gas and Electric Company

Historical Betas
(Gas Utilities)

Line	Company	Average	3Q20	2Q20	1Q20	4Q19	3Q19	2Q19	1Q19	4Q18	3Q18	2Q18	1Q18	4Q17	3Q17	2Q17	1Q17	4Q16	3Q16	2Q16	1Q16	4Q15	3Q15	2Q15	1Q15	4Q14	3Q14
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1	ALLETE, Inc.	0.75	0.85	0.85	0.60	0.65	0.65	0.65	0.65	0.65	0.70	0.75	0.75	0.80	0.75	0.80	0.80	0.75	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80
2	Alliant Energy Corporation	0.72	0.85	0.80	0.55	0.60	0.60	0.60	0.65	0.60	0.65	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80
3	Ameren Corporation	0.68	0.80	0.80	0.50	0.55	0.55	0.60	0.60	0.55	0.60	0.65	0.65	0.70	0.65	0.65	0.70	0.65	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
4	Avangrid, Inc.	0.45	0.80	0.80	0.40	0.40	0.40	0.40	0.40	0.30	0.30	0.40	0.35	NMF	NMF	NMF	NMF	NMF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Avista Corporation	0.72	0.95	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.70	0.70	0.75	0.75	0.70	0.70	0.70	0.70	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.75
6	Black Hills Corporation	0.86	1.00	0.65	0.70	0.70	0.75	0.80	0.75	0.80	0.85	0.90	0.90	0.90	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.85
7	CMS Energy Corporation	0.66	0.80	0.80	0.50	0.50	0.55	0.55	0.55	0.55	0.55	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.75	0.75	0.70	0.75	0.75	0.70	0.75
8	Consolidated Edison, Inc.	0.54	0.75	0.75	0.40	0.45	0.45	0.45	0.45	0.45	0.45	0.50	0.50	0.50	0.50	0.50	0.55	0.55	0.55	0.55	0.55	0.60	0.60	0.60	0.60	0.60	0.60
9	DTE Energy Company	0.67	0.90	0.90	0.50	0.55	0.55	0.55	0.55	0.55	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75
10	Duke Energy Corporation	0.59	0.85	0.85	0.45	0.50	0.50	0.50	0.50	0.55	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.50	0.60	0.60	0.60	0.60	0.60
11	Entergy Corporation	0.67	0.95	0.95	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.65	0.70	0.70	0.70	0.70
12	Eversource Energy	0.69	0.90	0.90	0.55	0.55	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
13	NorthWestern Corporation	0.67	0.90	0.55	0.60	0.60	0.60	0.60	0.55	0.60	0.65	0.65	0.70	0.70	0.65	0.65	0.70	0.70	0.70	0.70	0.70	0.70	0.75	0.70	0.70	0.70	0.70
14	Public Service Enterprise Group Incorporated	0.71	0.90	0.90	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.70	0.65	0.70	0.70	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
15	Sempra Energy	0.78	0.95	0.65	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.80	0.80	0.80	0.80	0.75	0.75	0.75
16	Southern Company	0.58	0.90	0.90	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.55	0.65	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.60	0.60	0.55	0.60	0.55	0.55	0.60
17	WEC Energy Group, Inc.	0.62	0.80	0.80	0.45	0.50	0.50	0.50	0.55	0.50	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.70	0.70	0.70	0.70	0.65	0.65	0.65
18	Xcel Energy Inc.	0.60	0.75	0.45	0.50	0.50	0.50	0.50	0.50	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.65
19	**Average**	0.66	0.87	0.77	0.54	0.56	0.57	0.58	0.58	0.58	0.60	0.65	0.66	0.68	0.66	0.66	0.68	0.67	0.69	0.71	0.73	0.73	0.73	0.73	0.72	0.72	0.72

Source: Value Line Software Analyzer

Exhibit CCW-17

CAPM Return

Witness: Christopher C. Walters

Kentucky Utilities Company and Louisville Gas and Electric Company

CAPM Return

Line	Description	Risk Premium[2] Derived MRP (1)	FERC 2-Step DCF[3] Derived MRP (2)	DCF[3] Derived MRP (3)
	Current Beta			
1	Risk-Free Rate[1]	2.10%	2.10%	2.10%
2	Market Risk Premium	9.10%	10.70%	12.50%
3	Beta[4]	0.88	0.88	0.88
4	**CAPM**	**10.14%**	**11.55%**	**13.14%**
	Historical Beta			
5	Risk-Free Rate[1]	2.10%	2.10%	2.10%
6	Market Risk Premium	9.10%	10.70%	12.50%
7	Historical Beta[4]	0.66	0.66	0.66
8	**CAPM**	**8.14%**	**9.20%**	**10.40%**
	Current S&P Global Market Intelligence Beta			
9	Risk-Free Rate[1]	2.10%	2.10%	2.10%
10	Market Risk Premium	9.10%	10.70%	12.50%
11	Beta[4]	0.65	0.65	0.65
12	**CAPM**	**8.03%**	**9.07%**	**10.24%**

Sources:

[1] *Blue Chip Financial Forecasts*, January 1, 2021, at 2.

[2] *Duff & Phelps, 2020 SBBI Yearbook* at 6-18.

[3] *State Street Global Advisors, downloaded 2/1/2021.*

[4] Exhibit CCW-16, page 1.

Kentucky Utilities Company and Louisville Gas and Electric Company

Development of the Market Risk Premium

Line	Description	MRP
Risk Premium Based Method:		
1	Lg. Co. Stock Real Market Return	9.00% [1]
2	Projected Consumer Price Index	2.00% [2]
3	Expected Market Return	11.18%
4	Risk-Free Rate	2.10% [2]
5	Market Risk Premium	**9.10%**
FERC 2-Step DCF Based Method:		
6	Short-Term S&P 500 Growth	12.83% [3]
7	Long-Term GDP Growth	4.35% [4]
8	Blended Growth Rate	11.13% [5]
9	Index Dividend Yield	1.53% [3]
10	Adjusted Yield	1.70%
11	Expected Market Return	12.83%
12	Risk-Free Rate	2.10% [2]
13	Market Risk Premium	**10.70%**
DCF Based Method:		
14	S&P 500 Growth	12.83% [3]
15	Index Dividend Yield	1.53% [3]
16	Adjusted Yield	1.73%
17	Expected Market Return	14.56%
18	Risk-Free Rate	2.10% [2]
19	Market Risk Premium	**12.50%**

Sources & Note:

[1] Duff & Phelps 2020 SBBI Yearbook at 6-18.

[2] *Blue Chip Financial Forecasts*, January 1, 2021.

[3] State Street Global Advisors, SPDR S&P 500 ETF, downloaded 2/1/2021.

[4] *Blue Chip Financial Forecasts*, December 1, 2020.

[5] (80%*12.83%) + (20%*4.35%) = 11.13%.