COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:)	
)	
ELECTRONIC APPLICATION OF KENTUCKY)	**Case No. 2018-00294**
UTILITIES COMPANY FOR AN ADJUSTMENT)	
OF ITS ELECTRIC RATES)	
)	
In the Matter of:)	
)	
ELECTRONIC APPLICATION OF LOUISVILLE)	**Case No. 2018-00295**
GAS AND ELECTRIC COMPANY FOR AN)	
ADJUSTMENT OF ITS ELECTRIC AND GAS)	
RATES)	
)	

Direct Testimony and Exhibits of

Christopher C. Walters

On behalf of

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

January 16, 2019

BAI

BRUBAKER & ASSOCIATES, INC.

Project 10675.1 & 10675.2

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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,

4   Suite 140, Chesterfield, MO 63017.

5   **Q   WHAT IS YOUR OCCUPATION?**

6   A   I am a Senior Consultant in the field of public utility regulation with the firm of

7   Brubaker & Associates, Inc., energy, economic and regulatory consultants.

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

2   **EXPERIENCE.**

3   A   This information is included in Appendix A to my testimony.

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

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

6   Defense and all other Federal Executive Agencies ("DoD/FEA"). The DoD/FEA

7   takes service from Kentucky Utilities Company ("KU") and Louisville Gas and

8   Electric Company ("LG&E") (collectively, "Companies") on several electric and gas

9   rate schedules. Specifically, Fort Knox takes gas service from LG&E on the

10   Substitute Gas Sales Service rate ("SGSS").

11   **Q**   **WHAT IS THE SUBJECT MATTER OF YOUR TESTIMONY?**

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

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

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

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

16   McKenzie's recommended return on equity range of 9.92% to 10.92%, with a

17   midpoint of 10.42%.

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

19   the Companies' position.

1 **Q PLEASE SUMMARIZE THE BALANCE OF YOUR TESTIMONY AS WELL**

2 **AS YOUR RECOMMENDATIONS AND CONCLUSIONS.**

3 A In Section II 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

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

9 capital.

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

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

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

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

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

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

16 current fair market ROE for the Companies to fall within the range of 9.00% to 9.70%,

17 with a midpoint of 9.35%.

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

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

20 Mr. McKenzie recommends a cost of equity within the range of 9.92% to 10.92%,

21 with a point estimate of 10.42%. I show that his estimates are overstated and do not

22 represent an accurate estimate of the current market cost of equity for the Companies,

23 and would be much higher than a fair and balanced ROE for ratemaking purposes.

1   **II.   ACCESS TO CAPITAL AND ECONOMIC ENVIRONMENT**

2   **II.A. Electric Industry Authorized Returns on Equity,**
3   **Access to Capital, and Credit Strength**

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

5   **AUTHORIZED RETURNS ON EQUITY FOR ELECTRIC AND GAS**

6   **UTILITIES, UTILITIES' CREDIT STANDING, AND UTILITIES' ACCESS**

7   **TO CAPITAL TO FUND INFRASTRUCTURE INVESTMENT.**

8   A   Authorized ROEs for both electric and gas utilities have declined over the last ten

9   years, as illustrated in Figure 1 below, and have been reasonably stable well below

10   10.0% for about the last six years.

FIGURE 1

Authorized Returns on Equity*
(Exclude Limited Issue Riders)

Source and Note:
*S&P Global Market Intelligenc*e, RRA Regulatory Focus, Major Rate Case Decisions -- January - September 2018,
October 11, 2018 at pages 8 and 9.
* Data includes January - September, 2018.
* Electric Returns exclude Limited Issue Riders.
* RRA excludes the 2017 Alaska ENSTAR decision from its calculations.

1 **Q   PLEASE DESCRIBE THE DISTRIBUTION OF AUTHORIZED RETURNS ON**

2 **EQUITY FOR THE LAST FEW YEARS.**

3 A   The industry average authorized ROE is inflated by certain outlier ROEs that are much

4   higher than the rest of the industry. The distribution of authorized returns, annually,

5   since 2016 is summarized in Table 1 below.

TABLE 1

Distribution of Authorized ROEs
(All Electric Utilities)

Line	Year	Average (1)	Median (2)	Share of Decisions ≤ 9.7% (3)
1	2016	9.60%	9.60%	53%
2	2017[1]	9.67%	9.60%	67%
3	2018[2]	9.54%	9.53%	63%

Source and Notes:
S&P Global Market Intelligence, downloaded 12/18/2018.
[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 exludes allowed ROE for generating facilities subject to special
ratemaking principles.
*Excludes Limited Issue Rider Cases.

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6   The distribution of returns shows that over the last few years, the share of

7   authorized returns below 9.7% has grown, and the most frequent distribution of

8   authorized equity returns is less than 9.7%, with many below 9.5%.

1 **Q** **HOW HAS CREDIT RATING ACTIVITY SINCE 2011 IMPACTED THE**

2 **CREDIT RATING OF THE ELECTRIC UTILITY INDUSTRY?**

3 A The credit rating changes for the electric utility industry over the last several years are

4 the result of marked improvement in overall financial health and credit quality as

5 shown below in Table 2. As shown in this table, in 2008, approximately 69% of the

6 electric utility industry was rated from BBB- to BBB+, 18% had a bond rating better

7 than BBB+, and around 13% of the industry was below investment grade.

8 The overall industry rating improved steadily over the subsequent eight years.

9 By 2016, none of the industry was below investment grade, and around 70% were

10 BBB+ or stronger. Overall, the improvement in the electric utility industry's overall

11 credit quality has been quite significant.

Table 2

S&P Ratings by Category
(Year End)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 Q3
Regulated											
A or higher	8%	7%	9%	8%	6%	3%	3%	3%	6%	6%	3%
A-	10%	15%	14%	14%	17%	20%	21%	22%	28%	34%	32%
BBB+	23%	22%	17%	19%	14%	17%	32%	33%	36%	29%	29%
BBB	23%	27%	31%	35%	36%	49%	37%	33%	22%	20%	24%
BBB-	23%	20%	17%	14%	17%	6%	3%	3%	8%	11%	12%
Below BBB-	13%	10%	11%	11%	11%	6%	5%	6%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: EEI 2018 Q3 Credit Ratings. Tab V. S&P Rating by Comp. Category.

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

2 **SUPPORT INFRASTRUCTURE CAPITAL PROGRAMS?**

3 A Yes. In its October 30, 2018 Utility Capital Expenditures Update report, *RRA*

4 *Financial Focus*, a division of S&P Global Market Intelligence, made several relevant

5 comments about utility investments generally:

6 • Projected 2018 capital expenditures for the 50 gas and electric
7 utilities in the RRA universe has stayed mostly steady at about
8 $133.8 billion, an all-time high for the sector and nearly 14% higher
9 than the prior forecast of $117.5 billion last fall.

10 • CapEx projections for the longer term increased modestly from our
11 previous analysis in April 2018, rising to $118.9 billion for 2019
12 and $105.1 billion for 2020, as companies' plans for future projects
13 solidified and new opportunities arose.

14 • The federal tax code changes that took effect at the start of 2018
15 preserved a provision strongly supported by the industry to
16 encourage investment: the deductibility of interest expense for
17 regulated utilities. Being among the most capital-intensive
18 industries, utilities would have had a much higher cost of capital
19 absent this provision, which would have impacted capital
20 investment planning and likely led to higher utility bills.[1]

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

22 **UTILITY EQUITY SECURITIES?**

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

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

25 and conditions, and at relatively low cost. As shown on Exhibit CCW-1, the historical

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

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

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[1]S&P Global Market Intelligence, RRA Financial Focus: "Utility Capital Expenditures Update," October 30, 2018.

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

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

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

4 **Q   HOW SHOULD THE KENTUCKY PUBLIC SERVICE COMMISSION**

5   **("COMMISSION") USE THIS MARKET INFORMATION IN ASSESSING A**

6   **FAIR RETURN FOR THE COMPANIES?**

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

8   historically low levels. While authorized ROEs have fallen to the mid 9.0% range;

9   utilities continue to have access to large amounts of external capital to fund large

10   capital programs. The Commission should carefully weigh all this important

11   observable market evidence in assessing a fair ROE for LG&E and KU.

12 **II.B. Regulated Utility Industry Outlook**

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

14   **UTILITIES.**

15 A   Standard & Poor's ("S&P") recently published a report titled "Industry Top Trends

16   2019: North America Regulated Utilities." In that report, S&P noted the following:

17   – **Ratings Outlook**: Rating trends across regulated electric, gas, and
18   water utilities in North America remain mostly stable, reflecting
19   generally supportive regulatory oversight. However, the industry's
20   financial measures weakened in 2018 as a result of U.S. tax reform,
21   robust capital spending, and flat to slightly negative load growth. In
22   general, those utilities most affected by these developments were those
23   who strategically operate with a minimal financial cushion at their
24   current rating.

25   *   *   *

1   **– Industry Trends:** <u>The North America utility industry is mostly</u>
2   <u>stable with some downside ratings exposure.</u> Weaker credit measures
3   from tax reform will likely persist in 2019, reflecting tax-related rate
4   reductions carryovers. However, we expect that some utilities will
5   offset this reduced revenue with further equity infusions or asset sales.
6   Other developing trends include rising interest rates, inflation,
7   technology, climate change, and regulatory lag, which could further
8   stress the industry's credit quality.[2]

9   Moody's more recently did place the industry on "Negative" outlook, to reflect

10   the uncertainty and "<u>short-term</u>" cash flow impacts primarily as a result of the change

11   in federal tax law, but also the large capital program for the industry.[3]

12   **II.C. Federal Reserve Monetary Policy**

13   **Q**   **HAVE YOU CONSIDERED CONSENSUS MARKET OUTLOOKS FOR**

14   **CHANGES IN INTEREST RATES IN FORMING YOUR RECOMMENDED**

15   **ROE IN THIS CASE?**

16   A   Yes. The outlook for changes in interest rates, inflation, and Gross Domestic Product

17   ("GDP") growth has been impacted by expectations that the Federal Reserve Bank

18   Open Market Committee ("FOMC") will raise short-term interest rates. Consensus

19   economists are expecting continued increases in the Federal Funds Rate as the FOMC

20   continues to normalize interest rates in response to the strengthening of the U.S.

21   economy.

22   This is evident from a comparison of current and forecasted changes in the

23   Federal Funds Rate. Table 3 below shows that while the Federal Funds Rate (the

24   short-term rate) is expected to increase over the next several years (a consensus

---

[2]*S&P Global Ratings*: "Industry Top Trends 2019: North America Regulated Utilities," November 8, 2018, at 1 (emphasis added).

[3]*Moody's Investors Service*: "Outlook: Regulated utilities - US, 2019 outlook shifts to negative due to weaker cash flows, continued high leverage," June 18, 2018 at 3.

1   increase of 1.9% to 3.0%), the consensus for increases in <u>long-term</u> interest rates is not

2   as significant (a consensus increase of 3.1% to 3.7%).

TABLE 3

Blue Chip Financial Forecasts
<u>**Projected Federal Funds Rate, 30-Year Treasury Bond Yields, and GDP Price Index**</u>

Publication Date	2Q 2018	3Q 2018	4Q 2018	1Q 2019	2Q 2019	3Q 2019	4Q 2019	1Q 2020
Federal Funds Rate								
Jul-18	1.7	2.0	2.2	2.4	2.6	2.8	2.9	
Aug-18	**1.7**	2.0	2.2	2.4	2.6	2.8	2.9	
Sep-18	**1.7**	2.0	2.2	2.4	2.6	2.8	2.9	
Oct-18		1.9	2.2	2.4	2.7	2.8	2.9	2.9
Nov-18		**1.9**	2.3	2.5	2.7	2.8	3.0	3.0
Dec-18		**1.9**	2.3	2.5	2.7	2.9	3.0	3.0
T-Bond, 30 yr.								
Jul-18	3.1	3.3	3.4	3.5	3.6	3.7	3.8	
Aug-18	**3.1**	3.2	3.3	3.5	3.6	3.7	3.7	
Sep-18	**3.1**	3.1	3.3	3.4	3.5	3.6	3.7	
Oct-18		3.1	3.3	3.4	3.5	3.6	3.7	3.6
Nov-18		**3.1**	3.3	3.5	3.6	3.6	3.7	3.7
Dec-18		**3.1**	3.4	3.5	3.6	3.6	3.7	3.7
GDP Price Index								
Jul-18	2.1	2.2	2.2	2.2	2.2	2.3	2.2	
Aug-18	**3.0**	2.3	2.2	2.3	2.2	2.3	2.2	
Sep-18	**3.0**	2.2	2.3	2.3	2.3	2.2	2.2	
Oct-18		2.2	2.3	2.3	2.3	2.2	2.2	2.2
Nov-18		**1.7**	2.4	2.3	2.3	2.2	2.3	2.2
Dec-18		**1.7**	2.3	2.2	2.3	2.2	2.2	2.2

Source and Note:
 Blue Chip Financial Forecasts, July 2018 through December 2018.
 Actual Yields in Bold

---

3   Importantly, one should recognize that an increase in the Federal Funds Rate

4   does not automatically result in an increase in long-term interest rates. Specifically, I

1   note that none of the eight increases in the Federal Funds Rate experienced over the

2   last few years caused comparable changes in long-term interest rates. This is

3   illustrated on in Figure 2.

FIGURE 2

Timeline of Federal Funds Rate Increases
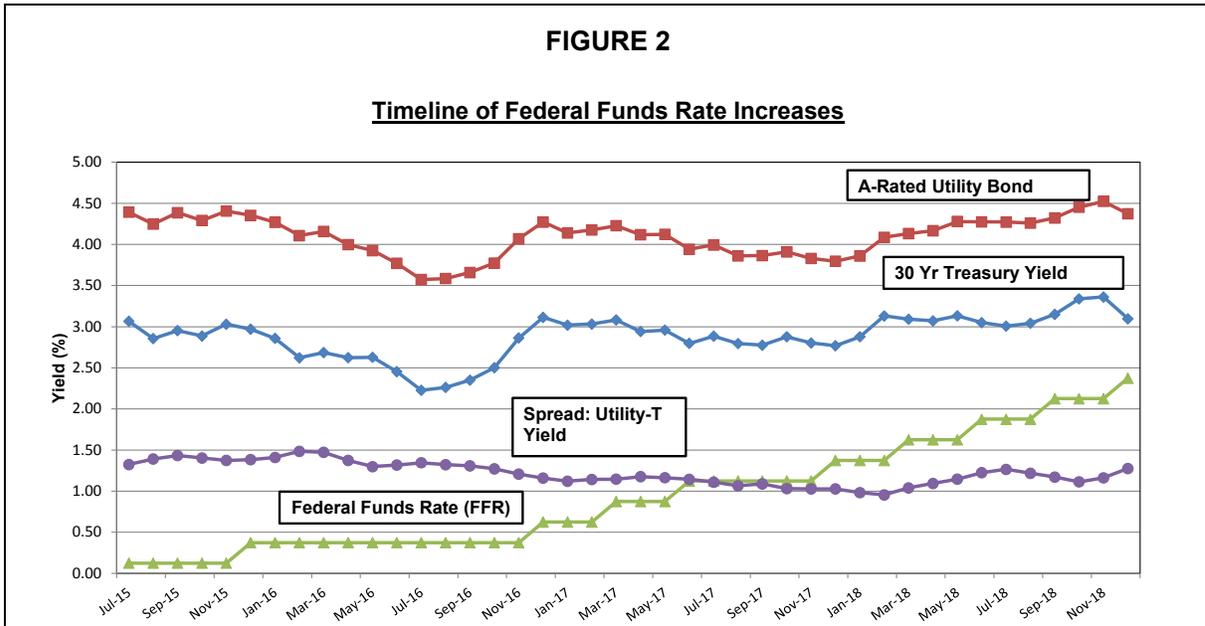
4   As shown in Figure 2 above, the actions taken by the FOMC to increase the

5   Federal Funds Rate have simply flattened the yield curve, and have not resulted in a

6   corresponding increase in long-term interest rates. This is significant because the cost

7   of common equity is impacted by long-term interest rates, not short-term interest rates.

8   As a result, the recent increases in the Federal Funds Rate, and the expectation of

9   continued increases in the Federal Funds Rate, have not, and are not expected to,

10   significantly impact long-term interest rates.

11   Also, the Federal Reserve has recently implemented a strategy to begin to

12   unwind its balance sheet position in long-term interest rate securities. The Federal

13   Reserve built up approximately $4.7 trillion of Treasury and mortgage-backed security

14   holdings as part of a quantitative easing ("QE") program that spanned 2008 to 2014.

1   During the QE program, the Federal Reserve procured long-term securities in an effort

2   to support the Federal Reserve's monetary policy, mitigate long-term interest rates,

3   and to stimulate the economy. In essence, by purchasing these securities, the Federal

4   Reserve was making capital more readily available at lower long-term interest rates.

5   The Federal Reserve recently started to unwind its balance sheet positions of

6   mortgage-backed securities and Treasury bonds. The Fed now engages in a slow and

7   systematic reduction to its balance sheet position. This Fed balance sheet action has

8   been disclosed to the market, and the impact on capital markets valuation and interest

9   rates is captured in current and projected interest rates.

10   For these reasons, the Federal Reserve actions on short-term interest rates and

11   unwinding its balance sheet have not resulted in material increases in long-term

12   interest rates.

13   **III.   RETURN ON COMMON EQUITY**

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

15   **COMMON EQUITY."**

16   A   A utility's cost of common equity, alternately described as the return on common

17   equity (commonly, "ROE"), is the expected return that investors require on an

18   investment in the utility. Investors expect to earn their required return from receiving

19   dividends and through stock price appreciation.

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

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

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

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

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

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

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

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

9   general standards provide the authorized return should: (1) be sufficient to maintain

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

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

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

13   **THE COMPANIES' COST OF COMMON EQUITY.**

14 **A**   I have used several models based on financial theory to estimate the Companies' cost

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

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

17   growth DCF using sustainable growth rate estimates; (3) a multi-stage growth DCF

18   model; (4) a Risk Premium model; and (5) a Capital Asset Pricing Model ("CAPM").

19   I have applied these models to a group of publicly traded utilities with investment risk

20   similar to the Companies.

1   **III.A. The Companies' Investment Risk**

2   **Q   PLEASE   DESCRIBE   THE   MARKET'S   ASSESSMENT   OF   THE**

3   **INVESTMENT RISK OF LG&E AND KU.**

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

5   investment risk must be done. The market's assessment of the Companies' investment

6   risk is best described by credit rating analysts' reports. The Companies' current

7   corporate bond ratings from Standard and Poor's ("S&P") and Moody's are A- and

8   A3, respectively.[4] The Companies' outlook from S&P and Moody's is "Stable". In

9   its most recent report on LG&E, S&P specifically stated:

10   **Business Risk: Excellent**

11   We assess LG&E's business risk profile based primarily on the
12   company's regulated integrated electric utility and natural gas
13   distribution operations under the generally constructive regulatory
14   framework in Kentucky. LG&E has limited scale, scope, and diversity,
15   serving a customer base of about 400,000 electric and about 320,000
16   natural gas customers in Louisville. The customer base consists largely
17   of residential and commercial customers, insulating the company from
18   fluctuations in demand and providing stability to the company's cash
19   flows. Our assessment also accounts for the modest operating diversity
20   of the company due to its electric and natural gas operations. The
21   company has about 3,000 megawatts (MW) of generation capacity,
22   which has higher operating risk than transmission and distribution
23   (T&D) operations. The company has been upgrading its coal-fired
24   generation plants to comply with environmental regulations. While the
25   capital costs of these upgrades are significant, spending can be
26   recovered through an environmental cost recovery mechanism, which
27   limits regulatory lag and is supportive of the credit profile. Under the
28   regulation of the Kentucky Public Service Commission (PSC), the
29   company benefits from other mechanisms such as a gas line tracker and
30   a pass-through fuel cost mechanism. These mechanisms increase the
31   stability of the company's returns.

32   *   *   *

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[4]S&P Global Market Intelligence, December 17, 2018.

1   **Financial Risk: Significant**

2   Under our base-case scenario, we project that LG&E's FFO to debt will
3   range from 21%-23% and debt to EBITDA will remain about 3.5x.
4   Over the next few years, we expect credit measures to benefit from the
5   company's use of regulatory mechanisms to recover its invested capital.
6   Our assessment also includes recently approved rate case outcomes that
increased electric rates by about $57 million and gas rates by about $7
million. We assess LG&E's financial risk profile as significant using
moderate financial benchmarks compared to the typical corporate
issuer, accounting for the company's low-risk regulated electric T&D
and natural gas distribution operations, which are partially offset by
relatively higher-risk regulated generation.[5]

7   **III.B. The Companies' Proposed Capital Structure**

8   **Q   WHAT CAPITAL STRUCTURE IS LG&E AND KU REQUESTING IN THIS**

9   **RATE CASE?**

10   A   The Companies' projected capital structure ending on April 30, 2020 is shown below

11   in Table 4.

TABLE 4

Proposed Capital Structure
(April 30, 2020)

Description	Ratemaking Weight
Short-Term Debt	1.89%
Long-Term Debt	45.27%
Common Equity	52.84%
Total	100.00%

Source: Schedule J-1.1/J-1.2.

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[5]*Standard & Poor's RatingsDirect*: "Summary: Louisville Gas & Electric Co.," December 27, 2017 at 4.

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 52.84% is significantly

4 higher than the average common equity ratio of my proxy group discussed below, as

5 well as the typical common equity ratio being authorized around the country. While I

6 am not making an explicit adjustment to my recommended return on equity to account

7 for the lower level of financial risk associated with a higher common equity ratio, I

8 have taken it into consideration in developing my recommended range and return.

9 **III.C. Risk Proxy Group**

10 **Q** **PLEASE DESCRIBE HOW YOU IDENTIFIED A PROXY UTILITY GROUP**

11 **THAT COULD BE USED TO ESTIMATE THE COMPANIES' CURRENT**

12 **MARKET COST OF EQUITY.**

13 A To start, I began with the same proxy group developed by the Companies' witness Mr.

14 McKenzie. From his proxy group, I removed five companies: Algonquin, Avangrid,

15 Emera, Fortis, and Southern Company. I eliminated Algonquin because it is not part

16 of the *Value Line* universe and is headquartered in Canada. I eliminated Avangrid

17 because more than 80% of its stock is owned by its ultimate parent company, *Iberdola*

18 S.A., a holding company headquartered in Spain. Including Avangrid in the proxy

19 group potentially overstates the required return for the Companies because of the

20 potential for investor-required premiums being reflected in the stock price. I

21 eliminated Emera because it is headquartered in Canada and, while it is part of the

22 *Value Line* universe, it is not categorized as being part of the Electric Utility industry.

1   Rather, *Value Line* has placed Emera in the Power industry. I excluded Fortis for

2   being a Canada-based company. Finally, I excluded Southern Company for its

3   divestiture of Gulf Power and Pivotal Utility Holdings, which were announced on

4   May 21, 2018.

5 **Q**   **PLEASE DESCRIBE YOUR PROXY GROUP'S INDICATED INVESTMENT**

6   **RISK RELATIVE TO THE COMPANIES.**

7 A   The proxy group shown in Exhibit CCW-2 has an average corporate credit rating from

8   S&P of BBB+, which is one notch less than the Companies' rating of A-. The proxy

9   group has an average corporate credit rating from Moody's of Baa1, which is one

10   notch lower than the Companies' credit rating from Moody's of A3.

11   I also note that the proxy group has an average common equity ratio of 41.3%

12   (including short-term debt) from S&P Global Market Intelligence ("MI") and 44.9%

13   (excluding short-term debt) from *Value Line*. the Companies' proposed common

14   equity ratio of 52.84% is significantly higher than that of the proxy group average

15   common equity ratio of 41.3% as reported by MI. Based on the relative credit ratings

16   and capital structures of the proxy group, the cost of equity results produced by the

17   market models described below should be considered high end estimates for the

18   investor required return for the Companies. As such, I take these data into

19   consideration in determining my recommendation.

1 **III.D. Discounted Cash Flow Model**

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

3 A   The DCF model posits that a stock price is valued by summing the present value of

4   expected future cash flows discounted at the investor's required rate of return or cost

5   of capital. This model is expressed mathematically as follows:

6       $$P_0 = \frac{D_1}{(1+K)^1} + \frac{D_2}{(1+K)^2} \ldots \frac{D_\infty}{(1+K)^\infty} \qquad \text{(Equation 1)}$$
7

8   P_0 = Current stock price
9   D = Dividends in periods 1 - ∞
10   K = Investor's required return

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

12   required return, known as "K."   If it is reasonable to assume that earnings and

13   dividends will grow at a constant rate, then Equation 1 can be expressed as follows:

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

15   K = Investor's required return
16   D_1 = Dividend in first year
17   P_0 = Current stock price
18   G = Expected constant dividend growth rate

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

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

21   **MODEL.**

22 A   As shown in Equation 2 above, the constant growth DCF model requires a current

23   stock price, expected dividend, and expected growth rate in dividends.

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

2 **GROWTH DCF MODEL?**

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

4 proxy group over a 13-week period ending on December 14, 2018. An average stock

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

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

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

8 A 13-week average stock price reflects a period that is short enough to contain

9 data that reasonably reflects current market expectations but not so short as to be

10 susceptible to market price variations that may not reflect the stock's long-term value.

11 In my judgment, a 13-week average stock price is a reasonable balance between the

12 need to reflect current market expectations and the need to capture sufficient data to

13 smooth out aberrant market movements.

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

15 **MODEL?**

16 A   I used the most recently paid quarterly dividend as reported in *Value Line*.[6] This

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

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

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

---

[6]*The Value Line Investment Survey*, October 26, November 16, and December 14, 2018.

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

4   dividends. Regardless of the method, for purposes of determining the market-required

5   return on common equity, one must attempt to estimate investors' consensus 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.[7] 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,

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

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

16   estimates from three sources: Zacks, MI, and Reuters. All such projections were

17   available on December 14, 2018, and all were reported online.[8]

18   Each consensus growth rate projection is based on a survey of 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 is not as reliable as a

21   consensus of market analysts' projections. The consensus estimate is a simple

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[7]*See, e.g.,* David Gordon, Myron Gordon, and Lawrence Gould, "Choice Among Methods of Estimating Share Yield," *The Journal of Portfolio Management*, Spring 1989.
[8]Exhibit CCW-3.

1   arithmetic average, or mean, of surveyed analysts' earnings growth forecasts.   A

2   simple average of the growth forecasts gives equal weight to all surveyed analysts'

3   projections. Therefore, a simple average, or arithmetic mean, of analyst forecasts is a

4   good proxy for market consensus expectations.

5   Q   **WHAT ARE THE GROWTH RATES YOU USED IN YOUR CONSTANT**

6   **GROWTH DCF MODEL?**

7   A   The growth rates I used in my DCF analysis are shown in Exhibit CCW-3.   The

8   average growth rate for my proxy group is 5.41%.

9   Q   **WHAT ARE THE RESULTS OF YOUR CONSTANT GROWTH DCF**

10   **MODEL?**

11 A   As shown in Exhibit CCW-4, the average and median constant growth DCF returns

12   for my proxy group for the 13-week analysis are 9.06% and 9.29%, respectively.

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

14   **CONSTANT GROWTH DCF ANALYSIS?**

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

16   average sustainable growth rate of 5.41%. The three- to five-year growth rates are

17   higher than the consensus long-term sustainable GDP growth rate of 4.19%.

1   **Q**   **HOW DID YOU ESTIMATE A MAXIMUM LONG-TERM SUSTAINABLE**

2   **GROWTH RATE?**

3   A   A long-term sustainable growth rate for a utility cannot exceed the growth rate of the

4   economy in which it sells its goods and services. For this reason, the projected

5   long-term Gross Domestic Product ("GDP") growth rate is the best proxy for the

6   maximum long-term sustainable growth rate for a utility investment. Those surveyed

7   by *Blue Chip Financial Forecasts* project that over the next 5 and 10 years, the U.S.

8   nominal GDP will grow at an annual rate of approximately 4.19%. These GDP

9   growth projections reflect a real growth outlook of around 2.0% to 2.1% and an

10   inflation outlook of around 2.1% going forward. As such, the average GDP growth

11   rate over the next 10 years is around 4.19%, which I believe is a reasonable proxy of

12   long-term sustainable growth.[9]

13   In my multi-stage growth DCF analysis, I discuss academic and investment

14   practitioner support for using the projected long-term GDP growth outlook as a

15   maximum sustainable growth rate projection; but using the long-term GDP growth

16   rate as a conservative projection for the maximum sustainable growth rate is logical,

17   and is generally consistent with academic and economic practitioner accepted

18   practices.

---

[9]*Blue Chip Financial Forecasts,* December 1, 2018, at 14.

1   **III.E. Sustainable Growth DCF**

2   **Q**   **WHAT IS THE SUSTAINABLE GROWTH DCF AND HOW DOES IT DIFFER**

3   **FROM THE CONSTANT GROWTH DCF?**

4   A   The sustainable growth DCF model relies on projections of utilities' earnings,

5   dividends, book value, and earned ROE to derive an estimate of a long-term

6   sustainable growth rate. This model differs from a DCF model using analysts' growth

7   rate projections in that it derives growth based on the operating performance of the

8   utility, issuance of new shares, and specific factors that can influence long-term

9   growth for the utility company.

10   **Q**   **PLEASE   DESCRIBE   HOW   YOU   ESTIMATED   A   SUSTAINABLE**

11   **LONG-TERM GROWTH RATE FOR YOUR SUSTAINABLE GROWTH DCF**

12   **MODEL.**

13   A   A sustainable growth rate is based on the percentage of the utility's earnings that is

14   retained and reinvested in utility plant and equipment. These reinvested earnings

15   increase the earnings base (rate base). Earnings grow when plant funded by reinvested

16   earnings is put into service, and the utility is allowed to earn its authorized return on

17   such additional rate base investment.

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

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

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

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

22   business funds more investments with retained earnings.

1   The payout ratios of the proxy group are shown in my Exhibit CCW-5.

2   Dividend payout ratios and earnings retention ratios then can be used to develop a

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

4   earnings retention ratio will help gauge whether analysts' current three- to five-year

5   growth rate projections can be sustained over an indefinite period of time.

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

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

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

9   As shown in Exhibit CCW-6, the average sustainable growth rate for the proxy

10   group using this internal growth rate model is 5.37%.

11   **Q   WHAT IS THE DCF ESTIMATE USING THESE SUSTAINABLE LONG-**

12   **TERM GROWTH RATES?**

13   A   A DCF estimate based on these sustainable growth rates is developed in Exhibit

14   CCW-7.   As shown there, and using the same formula in Equation 2 above, a

15   sustainable growth DCF analysis produces proxy group average and median DCF

16   results for the 13-week period of 9.02% and 8.47%, respectively.

17   **III.F. Multi-Stage Growth DCF Model**

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

19   A   Yes. My first constant growth DCF is based on consensus growth rate projections so

20   it is a reasonable reflection of rational investment expectations over the next three to

21   five years. A limitation of the constant growth DCF model is that it cannot reflect a

1   rational expectation that a period of high or low short-term growth can be followed by

2   a change in growth to a rate that is more reflective of long-term sustainable growth.

3   Because of this inherent limitation, I also performed a multi-stage growth DCF

4   analysis to reflect this outlook of changing growth expectations.

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

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

7   earnings growth outlooks and capital programs change. Utility companies go through

8   cycles of making investments in their systems. When utility companies are making

9   large investments, their rate base grows rapidly, which in turn accelerates earnings

10   growth. Once a major construction cycle is completed or levels off, growth in the

11   utility rate base slows and its earnings growth slows from an abnormally high three- to

12   five-year rate to a lower sustainable growth rate.

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

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

15   because the percentage growth in rate base will slow as a simple function of the fact

16   that each new increment invested will produce a smaller percentage change than the

17   last. In addition, the utility has limited human and capital resources available to

18   expand its construction program. Therefore, the three- to five-year growth rate

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

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

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

22   is sustainable.

1 **Q** **PLEASE DESCRIBE YOUR MULTI-STAGE GROWTH DCF MODEL.**

2 **A** The multi-stage growth DCF model reflects the possibility of non-constant growth for

3 a company over time. The multi-stage growth DCF model reflects three growth

4 periods: (1) a short-term growth period consisting of the first five years; (2) a

5 transition period, consisting of the next five years (6 through 10); and (3) a long-term

6 growth period starting in year 11 through perpetuity.

7 For the short-term growth period, I relied on the consensus growth projections

8 described above in relationship to my constant growth DCF model. For the transition

9 period, the growth rates were reduced or increased by an equal factor reflecting the

10 difference between the analysts' growth rates and the long-term sustainable growth

11 rate. For the long-term growth period, I assumed each company's growth would

12 converge to the maximum sustainable long-term growth rate – the GDP growth rate.

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

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

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

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

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

18 area economic growth and demand for utility service or infrastructure modernization

19 or compliance with environmental mandates. In other words, utilities invest in plant to

20 meet sales demand growth. Sales growth, in turn, is tied to economic growth in their

21 service areas.

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

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

3   as shown in Exhibit CCW-8. Utility sales growth has lagged behind GDP growth for

4   more than a decade. As a result, nominal GDP growth should be considered a proxy

5   toward the high-end for utility sales growth, rate base growth, and earnings growth.

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

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

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

9 A   Yes. This concept is supported in published financial literature and academic work.

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

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

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

18   The use of the economic growth rate is also supported by investment

19   practitioners as outlined as follows:

20   **Estimating Growth Rates**

21   One of the advantages of a three-stage discounted cash flow model is
22   that it fits with life cycle theories in regards to company growth. In
23   these theories, companies are assumed to have a life cycle with varying
24   growth characteristics. Typically, the potential for extraordinary growth
25   in the near term eases over time and eventually growth slows to a more
26   stable level.

---

[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   * * *

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

9   **Q**   **IS THERE ANY ACTUAL INVESTMENT HISTORY THAT SUPPORTS THE**

10   **NOTION   THAT   THE   CAPITAL   APPRECIATION   FOR   STOCK**

11   **INVESTMENTS WILL NOT EXCEED THE NOMINAL GROWTH OF THE**

12   **U.S. GDP?**

13 **A**   Yes. This is evident by a comparison of the compound annual growth, or geometric

14   average growth, of the U.S. GDP compared to the compound annual growth of the

15   U.S. stock market. Duff & Phelps measured the historical geometric growth of the

16   U.S. stock market over the period 1926-2017 to be approximately 6.0%.[12] During this

17   same time period, the U.S. nominal compound annual growth of the U.S. GDP was

18   approximately 6.4%.[13]

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

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

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

22   U.S. GDP growth outlook is likely a high-end estimate of the long-term sustainable

23   growth of U.S. stock investments.

---

[11]*Morningstar, Inc., Ibbotson SBBI 2013 Valuation Yearbook* at 51 and 52.
[12]*Duff & Phelps, 2018 SBBI Yearbook* at 6-17.
[13]U.S. Bureau of Economic Analysis, February 28, 2018.

1 **Q** **WHAT IS THE GEOMETRIC AVERAGE AND WHY IS IT APPROPRIATE**

2 **TO USE THIS MEASURE WHEN COMPARING GDP GROWTH TO**

3 **CAPITAL APPRECIATION IN THE STOCK MARKET?**

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

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

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

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

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

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

10 growth rate is most appropriate.

11 **Q** **HOW DID YOU DETERMINE A SUSTAINABLE LONG-TERM GROWTH**

12 **RATE THAT REFLECTS THE CURRENT CONSENSUS OUTLOOK OF THE**

13 **MARKET?**

14 A I relied on the consensus of long-term GDP growth projections. *Blue Chip Financial*

15 *Forecasts* publishes the consensus for GDP growth projections twice a year. These

16 analyst projections reflect current outlooks for GDP and are likely influential on

17 investors' expectations of future growth prospects. The consensus projections of

18 future GDP growth is 4.19% over the next 10 years.[15]

19 Therefore, I propose to use the consensus for projected 5- and 10-year average

20 GDP growth rates of 4.19%, as published by *Blue Chip Financial Forecasts*, as an

21 estimate of long-term sustainable growth. *Blue Chip Financial Forecasts* provides

[14]*New Regulatory Finance*, Roger Morin, PhD, at 133-134.
[15]*Blue Chip Financial Forecasts*, December 1, 2018, at 14.

1   real GDP growth projections of 2.0% to 2.1% and GDP inflation of 2.1%[16] over the

2   5-year and 10-year projection periods, or approximately 4.19% on nominal GDP

3   projections. These GDP growth forecasts represent the most likely views of market

4   participants because they are the consensus estimates provided by analysts and

5   economists surveyed by *Blue Chip Financial Forecasts*.

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

7   **GDP GROWTH?**

8 A   Yes, and these sources corroborate my use of the consensus projections, as shown

9   below in Table 5.

TABLE 5

GDP Forecasts

Source	Term	Real GDP	Inflation	Nominal GDP
Blue Chip Financial Forecasts	5-10 Yrs	2.1%	2.1%	4.2%
EIA - Annual Earnings Outlook	28 Yrs	2.0%	2.3%	4.4%
Congressional Budget Office	6 Yrs	1.8%	2.1%	4.0%
Moody's Analytics	25 Yrs	2.0%	1.8%	3.8%
Social Security Administration	48 Yrs			4.4%
The Economist Intelligence Unit	25 Yrs	1.9%	1.8%	3.7%

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

11   2018 Annual Report, the EIA projects real GDP through 2050 to be 2.0% and a

12   long-term GDP price inflation projection of 2.3%. The EIA data supports a long-term

13   nominal GDP growth outlook of 4.4%.[17]

---

[16]*Id.*
[17]DOE/EIA Annual Energy Outlook 2018 With Projections to 2050, February 2018, Table 20.

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

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

3   6 years, with a GDP price inflation outlook of 2.1%. The CBO 6-year outlook for

4   nominal GDP based on this projection is 4.0%.[18]

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

6   25-year outlook to 2047, Moody's Analytics is projecting real GDP growth of 2.0%

7   with GDP inflation of 1.8%.[19] Based on these projections, Moody's is projecting

8   nominal GDP growth of 3.8% over the next 25 years.

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

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

11   cost" scenario of approximately 50 years, is 4.4%.[20]

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

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

14   Economist Intelligence Unit is projecting real GDP growth of 1.9% with an inflation

15   rate of 1.8% out to 2050. The real GDP growth projection is in line with the

16   consensus. The long-term nominal GDP projection based on these outlooks is

17   approximately 3.7%.[21]

18   The real GDP and nominal GDP growth projections made by these

19   independent sources support the use of the consensus for 5-year and 10-year projected

20   GDP growth outlooks as a reasonable estimate of market participants' long-term GDP

21   growth.

---

[18]*CBO: The Budget and Economic Outlook: 2017 to 2027*, April 2018, downloaded April 17, 2018.
[19]www.economy.com, *Moody's Analytics Forecast*, January 24, 2018.
[20]www.ssa.gov, "2018 OASDI Trustees Report," Table VI.G4.
[21]*S&P Global Market Intelligence, Economist Intelligence Unit*, downloaded on March 14, 2018.

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

2   **IN YOUR MULTI-STAGE GROWTH DCF ANALYSIS?**

3 A I relied on the same 13-week average stock prices and the most recent quarterly

4   dividend payment data discussed above. For stage one growth, I used the consensus

5   growth rate projections discussed above in my constant growth DCF model. The first

6   stage covers the first five years, consistent with the time horizon of the securities

7   analysts' growth rate projections. The second stage, or transition stage, begins in year

8   6 and extends through year 10. The second stage growth transitions the growth rate

9   from the first stage to the third stage using a straight linear trend. For the third stage,

10   or long-term sustainable growth stage, starting in year 11, I used a 4.19% long-term

11   sustainable growth rate based on the consensus long-term projected nominal GDP

12   growth rate.

13 **Q** **WHAT ARE THE RESULTS OF YOUR MULTI-STAGE GROWTH DCF**

14   **MODEL?**

15 A As shown in Exhibit CCW-9, the average and median DCF returns on equity for my

16   proxy group using the 13-week average stock price are 8.07% and 7.79%,

17   respectively.

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

19 A The results from my DCF analyses are summarized in Table 6 below:

<div style="border:1px solid">

TABLE 6

Summary of DCF Results

Description	Proxy Group	
	Average	**Median**
Constant Growth DCF Model (Analysts' Growth)	9.06%	9.29%
Constant Growth DCF Model (Sustainable Growth)	9.02%	8.47%
Multi-Stage Growth DCF Model	8.07%	7.79%

</div>

1   Based on these results, I conclude that my DCF analysis indicates a cost of

2 equity of 9.20%. I am placing primary reliance on my constant growth DCF model

3 based on analyst growth rate estimates, because my review of the models demonstrates

4 that this is most representative of observable data regarding the current market cost of

5 equity for regulated utilities.

6 **III.G. Risk Premium Model**

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

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

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

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

11 the coupon payments on bonds represent contractual obligations.   In contrast,

12 companies are not required to pay dividends or guarantee returns on common equity

13 investments. Therefore, common equity securities are considered to be riskier than

14 bond securities.

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

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

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

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

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

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

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

8   estimates of the investor-required return at the time of the proceeding.

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

10   regulatory commission-authorized returns on common equity and contemporary

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

12   September 2018 because public utility stocks consistently traded at a premium to book

13   value during that period. This is illustrated in Exhibit CCW-10, which shows the

14   market-to-book ratio since 1986 for the electric utility industry was consistently above

15   a multiple of 1.0x. Over this period, an analyst can infer that authorized ROEs were

16   sufficient to support market prices that at least exceeded book value. This is an

17   indication that commission authorized returns on common equity supported a utility's

18   ability to issue additional common stock without diluting existing shares. It further

19   demonstrates utilities were able to access equity markets without a detrimental impact

20   on current shareholders.

21   Based on this analysis, as shown in Exhibit CCW-11, the average indicated

22   equity risk premium over U.S. Treasury bond yields has been 5.54%. Since the risk

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

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

2   method to measure the current ROE under the risk premium methodology.

3   I incorporated five-year and 10-year rolling average risk premiums over the

4   study period to gauge the variability over time of risk premiums. These rolling

5   average risk premiums mitigate the impact of anomalous market conditions and

6   skewed risk premiums over an entire business cycle. As shown on my Exhibit CCW-

7   11, the five-year rolling average risk premium over Treasury bonds ranged from

8   4.25% to 6.72%, while the 10-year rolling average risk premium ranged from 4.38%

9   to 6.57%.

10   As shown on my Exhibit CCW-12, the average indicated equity risk premium

11   over contemporary A-rated Moody's utility bond yields was 4.18%. The five-year and

12   10-year rolling average risk premiums ranged from 2.88% to 5.57% and 3.20% to

13   5.34%, respectively.

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

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

16   **ACCURATE   CONCLUSIONS   ABOUT   CONTEMPORARY   MARKET**

17   **CONDITIONS?**

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

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

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

21   ROE and the corresponding equity risk premiums were supportive of investors' return

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

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

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

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

4   estimate contemporary risk premiums.

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

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

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

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

9   returns due to unexpected and abnormal stock price performance. Short-term,

10   abnormal actual returns would be smoothed over time and the achieved actual

11   investment returns over long time periods would approximate investors' expected

12   returns. Therefore, it is reasonable to assume that averages of annual achieved returns

13   over long time periods will generally converge on the investors' expected returns.

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

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

16   historical period of time.

17 **Q   BASED ON THIS DATA, WHAT RISK PREMIUM HAVE YOU USED TO**

18   **ESTIMATE THE COMPANIES' COST OF COMMON EQUITY IN THIS**

19   **PROCEEDING?**

20 A   The equity risk premium should reflect the relative market perception of risk in the

21   utility industry today. I have gauged investor perceptions in utility risk today in

22   Exhibit CCW-13, where I show the yield spread between utility bonds and Treasury

1   bonds over the last 39 years. As shown in this exhibit, the average utility bond yield

2   spreads over Treasury bonds for "A" and "Baa" rated utility bonds for this historical

3   period are 1.50% and 1.94%, respectively. Yield spreads of "A" and "Baa" rated

4   utility bonds over Treasury bonds during 2017 were 1.10% and 1.48%, respectively,

5   which are lower than the 39-year averages. Similarly, yield spreads of "A" and "Baa"

6   rated utility bonds over Treasury bonds during the first three quarters of 2018 were

7   1.12% and 1.51%, respectively, which are lower than the 39-year averages.

8   A current 13-week average "A" rated utility bond yield of 4.46% when

9   compared to the current Treasury bond yield of 3.30%, as shown in Exhibit CCW-14,

10   page 1, implies a yield spread of 116 basis points. This current utility bond yield

11   spread is lower than the 39-year average spread for "A" rated utility bonds of 1.50%.

12   The current spread for the "Baa" rated utility bond yield of 164 basis points is 30 basis

13   points lower than the 39-year average of 1.94%.

14   These utility bond yield spreads are evidence that the market perception of

15   utility risk is below average, or in line, relative to the historical time period and

16   demonstrate that utilities continue to have strong access to capital in the current

17   market.

18 **Q   WHAT IS YOUR RECOMMENDED RETURN FOR THE COMPANIES**

19   **BASED ON YOUR RISK PREMIUM STUDY?**

20 A   Because of today's relatively low level of interest rates and uncertainty revolving

21   around forecasted interest rates, I am recommending more weight be given to the

22   high-end risk premium estimates than the low-end in order to be conservative. To

1   calculate the estimated equity risk premium, I applied 75% weight to my high-end risk

2   premium estimates and 25% to the low-end.   Applying these weights, the risk

3   premium for Treasury bond yields would be approximately 6.1%,[22] which is

4   considerably higher than the 33-year average risk premium of 5.54% and reasonably

5   reflective of the 3.7% projected Treasury bond yield. An equity risk premium of 6.1%

6   added to the projected Treasury bond yield of 3.7% produces an estimated cost of

7   equity of 9.8%.

8   Similarly, applying these weights to the utility risk premium indicates a risk

9   premium of 4.9%.[23] This risk premium is above the 33-year historical average risk

10   premium of 4.18%. Adding this risk premium to the average of current observable

11   A-rated utility bond yields of 4.46%, produces an estimated cost of equity of

12   approximately 9.4%. Adding this risk premium to the current Baa-rated utility bond

13   yield of 4.94%, produces an estimated cost of equity of approximately 9.8%. The

14   estimated risk premium over utility bond yields is in the range of 9.4% to 9.8%, with

15   an average of 9.6%.

16   Based on this methodology, my Treasury bond risk premium and my utility

17   bond risk premium indicate a return in the range of 9.6% to 9.8%, with an average of

18   9.7%.

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[22](4.25% * 25%) + (6.72% * 75%) = 6.10%.
[23](2.88% * 25%) + (5.57% * 75%) = 4.90%.

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

2 **Q   PLEASE DESCRIBE THE CAPM.**

3 A   The CAPM is based upon the theory that the market-required rate of return for a

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

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

6   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

14   diversified portfolio. When stocks are held in a diversified portfolio, stock-specific

15   risks can be eliminated by balancing the portfolio with securities that react in the

16   opposite direction to firm-specific risk factors (e.g., business cycle, competition,

17   product mix, and production limitations).

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

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

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

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

22   non-systematic risks are business risks. The CAPM theory suggests the market will

23   not compensate investors for assuming risks that can be diversified away. Therefore,

24   the only risk investors will be compensated for are systematic, or non-diversifiable,

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

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

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

3   market risk premium.

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

5   **RATE?**

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

7   yield is 3.7%.[24]   The current 30-year Treasury bond yield is 3.30%, as shown in

8   Exhibit CCW-14. Again, in an effort to provide a conservative ROE estimate, I used

9   *Blue Chip Financial Forecasts'* projected 30-year Treasury bond yield of 3.70% for

10   my CAPM analysis.

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

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

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

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

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

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

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

18   nominal risk-free rate (or expected inflation rate and real risk-free rate) included in a

19   long-term bond yield is a reasonable estimate of the nominal risk-free rate included in

20   common stock returns.

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[24]*Blue Chip Financial Forecasts*, December 1, 2018 at 2.

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

2   unanticipated future inflation and interest rates. As such, in this regard, a Treasury

3   bond yield is not a risk-free rate. Risk premiums related to unanticipated inflation and

4   interest rates reflect systematic market risks. Consequently, for companies with betas

5   less than 1.0, using the Treasury bond yield as a proxy for the risk-free rate in the

6   CAPM analysis can produce an overstated estimate of the CAPM return.

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

8 A   As shown in Exhibit CCW-15, the proxy group average *Value Line* beta estimate is

9   0.59.

10 **Q   HOW DID YOU DERIVE YOUR ESTIMATES OF THE MARKET RISK**

11   **PREMIUM?**

12 A   I derived two market risk premium estimates: a forward-looking estimate and one

13   based on a long-term historical average.

14   The forward-looking estimate was derived by estimating the expected return

15   on the market (as represented by the S&P 500) and subtracting the risk-free rate from

16   this estimate. I estimated the expected return on the S&P 500 by adding an expected

17   inflation rate to the long-term historical arithmetic average real return on the market.

18   The real return on the market represents the achieved return above the rate of inflation.

19   Duff & Phelps' *2018 SBBI Yearbook* estimates the historical arithmetic

20   average real market return over the period 1926 to 2017 to be 9.0%.[25] A current

---

[25]*Duff & Phelps, 2018 SBBI Yearbook at 6-18.*

1   consensus for projected inflation, as measured by the Consumer Price Index, is

2   2.3%.[26] Using these estimates, the expected market return is 11.5%.[27] The market

3   risk premium then is the difference between the 11.5% expected market return and my

4   3.7% risk-free rate estimate, or 7.8%.

5   My historical estimate of the market risk premium was also calculated by using

6   data provided by Duff & Phelps in its *2018 SBBI Yearbook*. Over the period 1926

7   through 2017, the Duff & Phelps study estimated that the arithmetic average of the

8   achieved total return on the S&P 500 was 12.1%[28] and the total return on long-term

9   Treasury bonds was 6.00%.[29] The indicated market risk premium is 6.1% (12.1% -

10   6.0% = 6.1%).

11   The long-term government bond yield of 6.0% occurred during a period of

12   inflation of around 3.0%, thus implying a real return on long-term government bonds

13   of around 3.0%.

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

15   A   Duff & Phelps makes several estimates of a forward-looking market risk premium

16   based on actual achieved data from the historical period of 1926 through 2017 as well

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

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

19   return on Treasury bonds. The total return includes capital appreciation, dividend or

20   coupon reinvestment returns, and annual yields received from coupons and/or

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[26]*Blue Chip Financial Forecasts*, December 1, 2018 at 2.
[27]$\{ \ [\ (1 + 0.090) * (1 + 0.023) \ ] - 1 \ \} * 100.$
[28]*Duff & Phelps, 2018 Yearbook at 6-17.*
[29]*Id.*

1   dividend payments. The income return, in contrast, only reflects the income return

2   received from dividend payments or coupon yields. Duff & Phelps claims the income

3   return is the only true risk-free rate associated with Treasury bonds and is the best

4   approximation of a truly risk-free rate.[30] I disagree with this assessment from Duff &

5   Phelps because it does not reflect a true investment option available to the marketplace

6   and therefore does not produce a legitimate estimate of the expected premium of

7   investing in the stock market versus that of Treasury bonds. Nevertheless, I will use

8   Duff & Phelps' conclusion to show the reasonableness of my market risk premium

9   estimates.

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

11   estimates a market risk premium of 7.07% based on the difference between the total

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

13   Treasury bond investments over the 1926-2017 period.[31]

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

15   produced a market risk premium estimate of 6.04%.[32]

16   Duff & Phelps explains that the historical market risk premium based on the

17   S&P 500 was influenced by an abnormal expansion of price-to-earnings ("P/E") ratios

18   relative to earnings and dividend growth during the period, primarily over the last

19   30 years. Duff & Phelps believes this abnormal P/E expansion is not sustainable.[33]

20   Therefore, Duff & Phelps adjusted this market risk premium estimate to normalize the

21   growth in the P/E ratio to be more in line with the growth in dividends and earnings.

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[30]*Duff & Phelps 2017 Valuation Handbook* at 3-32.
[31]*Duff & Phelps 2018 Valuation Handbook* at 3-45.
[32]*Id.*
[33]*Id.* at 3-43.

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

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

3   economic information, multiple risk premium estimation methodologies, and the

4   current state of the economy by observing measures such as the level of stock indices

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

6   utilizing a "normalized" risk-free rate of 3.5%, Duff & Phelps concludes the current

7   expected, or forward-looking, market risk premium is 5.0%, implying an expected

8   return on the market of 8.5%.[34]

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

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

11   bond yield, the results of my CAPM analysis should be considered conservative

12   estimates for the cost of equity.

13 **Q   HOW DOES YOUR ESTIMATED MARKET RISK PREMIUM RANGE**

14   **COMPARE TO THAT ESTIMATED BY DUFF & PHELPS?**

15 A   The Duff & Phelps analyses indicate a market risk premium falls somewhere in the

16   range of 5.0% to 7.1%. My market risk premium falls in the range of 6.1% to 7.8%.

17   My average market risk premium of 7.0% is at the high end of the Duff & Phelps

18   range.

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[34]*Id.* at 3-32 and 3-33.

1   **Q**   **WHAT ARE THE RESULTS OF YOUR CAPM ANALYSIS?**

2   A   As shown in Exhibit CCW-16 based on my low market risk premium of 6.1% and my

3   high market risk premium of 7.8%, a risk-free rate of 3.7%, and a beta of 0.59, my

4   CAPM analysis produces a return of approximately 7.32% to 8.33%. Based on my

5   assessment of risk premiums in the current market, as discussed above, I recommend

6   the high-end CAPM return estimate because it closely aligns the market risk premium

7   with the prevailing risk-free rate. I recommend a CAPM return of 8.33%, rounded to

8   8.30%.

9   **III.I. ROE Summary**

10   **Q**   **BASED ON THE RESULTS OF YOUR ANALYSES DESCRIBED ABOVE,**

11   **WHAT ROE DO YOU RECOMMEND FOR THE COMPANIES?**

12   A   Based on my analyses, I estimate the Companies' current market cost of equity to be

13   9.35%. My recommended ROE of 9.35% is at the midpoint of my estimated range of

14   9.00% to 9.70%. As shown in Table 7 below, the high-end of my estimated range is

15   based on my risk premium studies. The low-end is based on a combination of my

16   DCF and CAPM analyses.

TABLE 7

Return on Common Equity Summary

Description	Results
DCF	9.20%
Risk Premium	9.70%
CAPM	8.30%

1   My ROE estimates reflect observable market evidence, the impact of Federal

2   Reserve policies on current and expected long-term capital market costs, an

3   assessment of the current risk premium built into current market securities, and a

4   general assessment of the current investment risk characteristics of the electric utility

5   industry and the market's demand for utility securities.

6 **Q**   **WHAT IS THE OVERALL RATE OF RETURN IS PRODUCED AS A**

7   **RESULT OF YOUR RECOMMENDATIONS?**

8 A   As shown in Table 8 below, the overall rate of return produced by my recommended

9   ROE of 9.35% and the Companies' proposed capital structure is 7.05%.

TABLE 8

Overall Rate of Return
(April 30, 2020)

Description	Ratemaking Weight	Cost of Capital
Short-Term Debt	1.89%	3.25%
Long-Term Debt	45.27%	4.53%
Common Equity	<u>52.84%</u>	<u>9.35%</u>
Total	100.00%	7.05%

1   **IV.   RESPONSE TO THE COMPANIES' WITNESS MR. ADRIEN MCKENZIE**

2   **IV.A. Summary of Response**

3   **Q   WHAT IS THE COMPANIES' RETURN ON EQUITY RECOMMENDATION?**

4   A   Mr. McKenzie recommends a return on equity of 10.42%, which is the midpoint of his

5   recommended range of 9.92% to 10.92%.[35]   His recommendation includes an

6   adjustment of 12 basis points to account for flotation costs.[36]

7   Mr. McKenzie's recommended range, including his proposed flotation cost

8   adjustment, are unreasonable and should be rejected. For the reasons discussed below,

9   his 12 basis point flotation cost adjustment further exacerbates an already overstated

10   "bare bones" fair return on equity for the Companies.

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[35]McKenzie Direct Testimony at 6-7.
[36] *Id.* at 7.

1   **IV.B. Flotation Cost Adjustment**

2   **Q   DID MR. MCKENZIE INCLUDE A FLOTATION COST ADJUSTMENT IN**

3   **HIS RECOMMENDED RETURN FOR THE COMPANIES?**

4   A   Yes. Mr. McKenzie included an upward adjustment of 12 basis points to compensate

5   for flotation costs to his return on equity recommendation.[37] He acknowledges there is

6   no standard method for reflecting flotation costs in return on equity methodology,[38] so

7   he proposes a methodology that is "[t]he most common method used to account for

8   flotation costs in regulatory proceedings [...]".[39] In effect, he adjusts his proxy

9   group's average dividend yield of 4.0% by a historical average flotation cost of 3.1%

10   he calculated on his Exhibit No. 11. Applying this flotation cost adjustment of 3.1%

11   to his proxy group's dividend yield of 4.0% produces a flotation cost adjustment of 12

12   basis points.[40] This flotation cost adjustment is intended to recover the actual cost a

13   utility incurs by issuing additional stock to the public.

14 **Q   IS MR. MCKENZIE'S FLOTATION COST RETURN ON EQUITY ADDER**

15   **REASONABLE?**

16 A   No. Mr. McKenzie's flotation cost return on equity adder is not reasonable or justified

17   for several reasons. First, the adder is not based on the recovery of prudent and

18   verifiable actual flotation costs incurred by LG&E and KU. As discussed at page 72

19   of Mr. McKenzie's direct testimony, he derives a flotation cost adder based on cost

20   information of other publicly traded utility holding companies. Because he does not

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[37] *Id.*
[38] *Id.* at 69.
[39] *Id.* at 72.
[40] *Id.*

1   show that his adjustment is based on the Companies' actual and verifiable flotation

2   expenses, there are no means of verifying whether Mr. McKenzie's proposal is

3   reasonable or appropriate. Stated differently, Mr. McKenzie's flotation cost return on

4   equity adder is not based on known and measurable costs. Therefore, the Commission

5   should reject a flotation cost return on equity adder for the Companies.

6   **IV.C. Return on Equity**

7   **Q   HOW DID MR. MCKENZIE DEVELOP HIS RETURN ON EQUITY RANGE?**

8   A   Mr. McKenzie developed his return on equity recommendation by applying the DCF,

9   the traditional CAPM, the Empirical CAPM ("ECAPM"), a Risk Premium model, and

10   an Expected Earnings analysis to his utility proxy group. Then he corroborates his

11   results by developing a non-utility DCF model.

12   As shown below in Table 9, Mr. McKenzie concludes that a "bare-bones"

13   return on equity in the range of 9.8% to 10.8%, with a midpoint of 10.1%. Then, Mr.

14   McKenzie adds his flotation cost adjustment of 12 basis points to produce his

15   recommended range of 9.92% to 10.92% and return on equity of 10.42%. However,

16   reasonable adjustments to Mr. McKenzie's DCF, CAPM, ECAPM, and Risk Premium

17   studies reduce his return on equity estimate for the Companies to no higher than my

18   recommended return on equity of 9.35%.

TABLE 9

Mr. McKenzie's ROE Analysis

Model	Average (1)	Corrected (2)
DCF	8.9% - 10.5%	9.5%
CAPM (Current)		
Unadjusted	9.6%	8.2%
Size Adjusted	10.1%	Reject
CAPM (Projected)		
Unadjusted	10.0%	9.1%
Size Adjusted	10.4%	Reject
ECAPM (Current)		
Unadjusted	10.5%	Reject
Size Adjusted	11.0%	Reject
ECAPM (Projected)		
Unadjusted	10.8%	Reject
Size Adjusted	11.2%	Reject
Risk Premium		
Current	10.0%	8.7%
Projected	11.0%	8.7%
Expected Earnings	10.8% - 11.1%	Reject
Non-Utility DCF	9.9% - 11.0%	Reject
Range	**9.8% - 10.8%**	**8.2% - 9.5%**
Flotation Cost Adjustment	0.12%	Reject
Adjusted Range	**9.92% - 10.92%**	
Recommended ROE	**10.42%**	**9.35%**

_____
Source: Exhibit No. 2.

1 **Q** **PLEASE DESCRIBE MR. MCKENZIE'S DCF ANALYSIS.**

2 A Mr. McKenzie applied the traditional DCF model to his utility proxy group. Based on

3 his utility proxy group, the DCF results average in the range of 8.9% to 10.5% with a

4 midpoint of 9.7%.

5 In developing his recommended DCF range, Mr. McKenzie excluded what he

6 found to be outlier results. Mr. McKenzie removed 11 low-end outliers and only three

7 high-end outlier from his DCF results.[41]

8 **Q** **CAN MR. MCKENZIE'S DCF ANALYSIS BE ADJUSTED TO PRODUCE**

9 **MORE REASONABLE RESULTS?**

10 A Yes. Mr. McKenzie's proposal to selectively remove what he believes to be low-end

11 and high-end outliers from the proxy group has the effect of manipulating the results

12 of the proxy group study. Mr. McKenzie simply narrows the range of the proxy group

13 results to produce a result which he finds to be reasonable. This is hardly an

14 independent assessment of what the current market cost of equity is for the

15 Companies.

16 A better methodology would be to rely on the results of the proxy group, by

17 assessing the central tendency of the proxy group results. In the presence of outliers, a

18 more accurate method of measuring the central tendency of the proxy group's results

19 would be to measure the median of all the DCF return estimates. In doing so, this

20 would lower Mr. McKenzie's DCF range of 8.9% to 10.5% down to 8.0% to 9.9% for

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[41]Exhibit No. 5, page 3.

1   his utility proxy group, including the br+sv DCF results. Excluding the br+sv results

2   would produce a range between 9.0% and 9.9%, with a midpoint of 9.5%.

3   **Q   PLEASE DESCRIBE MR. MCKENZIE'S CURRENT AND PROJECTED**

4   **TRADITIONAL CAPM ANALYSES.**

5   A   Mr. McKenzie developed a traditional CAPM analysis based on current and projected

6   Treasury bond yields. Mr. McKenzie estimates a market return of 13.5%. From this

7   market return estimate he subtracts his current and projected risk-free rates of 3.1%

8   and 4.0%, to arrive at current and projected market risk premiums of 10.1% and 9.2%,

9   respectively.[42] He relies on the *Value Line* utility betas for the companies included in

10   his proxy group to produce an average cost of equity of 8.6% to 9.0%.[43] Then he each

11   of his CAPM return estimates to account for any size adjustment based on each

12   company's market capitalization. This size adjustment has increased his current bond

13   yield CAPM from 9.6% to 10.1% and his projected bond yield CAPM result from

14   10.0% to 10.4%.

15   **Q   ARE MR. MCKENZIE'S CURRENT AND PROJECTED CAPM ANALYSES**

16   **REASONABLE?**

17   A   No. I have several concerns with Mr. McKenzie's CAPM analyses. In short, Mr.

18   McKenzie's CAPM analyses are overstated for at least three reasons: (1) his expected

19   return on the market of 13.2% is based on a growth rate of 10.9%, which is more than

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[42]Exhibit No. 7.
[43]*Id.*

1   twice the expected growth of the U.S. economy; (2) his projected interest rate of 4.0%

2   is too high and without merit; and (3) his size adjustment is not reasonable.

3 **Q   WHY DO YOU BELIEVE MR. MCKENZIE'S EXPECTED RETURN ON THE**

4 **MARKET IS OVERSTATED?**

5 A   Mr. McKenzie's expected return on the market of 13.2% is based on a dividend yield

6   of 2.3% and an expected growth rate of 10.9%. The expected growth rate of 10.9%,

7   and ultimately the expected return on the market of 13.2%, is unreasonably high and

8   unsustainable.

9   Mr. McKenzie obtained growth rates for the dividend paying S&P 500

10   companies from three sources including Zacks, Value Line, and IBES. He uses these

11   growth rates to perform three DCF analyses on the market. The growth rates Mr.

12   McKenzie relies on include numbers that do not make logical sense from an economic

13   perspective. For example, Mr. McKenzie's expected growth of the market of 10.9%

14   included companies with expected growth rates well in excess of 20%. In fact, several

15   of Mr. McKenzie's growth rates were in excess of 20.0% including 34 from IBES, six

16   from Zacks, and 23 from *Value Line*. Even more illogical, Mr. McKenzie included

17   growth rates as high as 49.0% from IBES, 30.0% from Zacks, and 44.5% from *Value*

18   *Line*. As I explained in greater detail above, growth rates of this magnitude cannot be

19   reasonably expected to continue into perpetuity, which is the time period for which the

20   DCF is based on.

1   **Q**   **HOW DO MR. MCKENZIE'S MARKET RISK PREMIUMS COMPARE TO**

2   **THOSE ESTIMATED BY DUFF & PHELPS?**

3   A   As described above, Duff & Phelps has calculated three market risk premiums in the

4   range of 5.00% to 7.07%. The 5.00% risk premium is the Duff & Phelps

5   recommended normalized risk premium and corresponds with a normalized risk-free

6   rate of 3.5%. Both of Mr. McKenzie's market risk premiums are significantly above

7   all risk premiums identified by Duff & Phelps, and one of his estimates is more than

8   double the Duff & Phelps normalized market risk premium of 5.0%. It should be

9   noted that Mr. McKenzie's proposed market risk premium of 10.1% exceeds the

10   maximum allowable market risk premium in the Duff & Phelps Cost of Capital

11   Navigator.

12 **Q**   **WHY DO YOU FIND MR. MCKENZIE'S SIZE ADJUSTMENT**

13   **INAPPROPRIATE?**

14 A   Mr. McKenzie's size adjustment return on equity adder is based on estimates made by

15   Duff & Phelps's 2018 Cost of Capital Navigator. Duff & Phelps estimates various

16   size adjustments based on differentials in beta estimates tied to the size of a company.

17   The main concern with these size adjustments as applied by Mr. McKenzie, is that

18   they are not based on risk comparable companies relative to the utility industry or the

19   Companies.

1 **Q WHY IS MR. MCKENZIE'S SIZE ADJUSTMENT TO HIS CAPM RETURN**

2 **NOT RISK COMPARABLE TO THE COMPANIES?**

3 A His size adjustment is based on companies that have significantly more systematic

4 risks that are not reflective of the utility industry or the Companies. The size

5 adjustments relied on by Mr. McKenzie reflects companies that have unadjusted beta

6 estimates well in excess of 1.00.[44] I have provided the beta estimates, as calculated by

7 Duff & Phelps for each decile below in Table 10.

TABLE 10

Duff & Phelps Size Adjustments and Corresponding Betas

CRSP Decile		Market Cap	Size Premium	OLS Beta	VL Adj. Proxy Beta	Proxy OLS Beta
1	$	25,142.834	-0.30%	0.92	0.65	0.45
2	$	12,067.589	0.55%	1.04	0.65	0.45
3	$	6,557.519	0.83%	1.11	0.65	0.45
4	$	4,097.960	0.86%	1.13	0.65	0.45
5	$	2,763.719	1.36%	1.17	0.65	0.45
6	$	1,815.680	1.63%	1.17	0.65	0.45
7	$	1,175.369	1.58%	1.25	0.65	0.45
8	$	657.705	1.90%	1.30	0.65	0.45
9	$	299.400	2.48%	1.34	0.65	0.45
10	$	2.531	5.37%	1.39	0.65	0.45

Source:
Duff & Phelps Cost of Capital Navigator, CRSP Deciles Size Study.

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8 These unadjusted beta estimates are substantially higher than the average

9 <u>adjusted</u> beta of 0.65 for the utility proxy group used by Mr. McKenzie as reflective of

10 the Companies' investment risk. To put this into a more of an apple-to-apples

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[44]*Duff & Phelps Cost of Capital Navigator, CRSP Deciles Size Study.*

1   comparison, I have also provided the average unadjusted OLS beta for Mr.

2   McKenzie's proxy group (0.45). As shown above, every decile measured by Duff &

3   Phelps has a much higher beta than Mr. McKenzie's utility group. This should be

4   interpreted as, no matter which decile is being observed, the average company being

5   measured in that decile is somewhere between 2x and 3.1x more sensitive to

6   movements in the market than the average company in Mr. McKenzie's proxy group

7   as measured by beta. In other words, the typical company in each decile is much

8   riskier than the typical utility company. Because of this significant disparity in risk, as

9   measured by beta, Mr. McKenzie's size adjustment produces a CAPM return estimate

10   that does not produce a risk appropriate return for the Companies and therefore, is not

11   a reasonable and fair return for LG&E and KU.

12   **Q   CAN YOU EXPLAIN HOW BETA CORRESPONDS WITH THE LEVEL OF**

13   **INVESTMENT RISK FOR A COMPANY AND THEREFORE PRODUCES AN**

14   **APPROPRIATE RISK-ADJUSTED RETURN FOR A SUBJECT COMPANY?**

15   A   Yes. Beta represents a measure of systematic or non-diversifiable, market-related risk.

16   All subject companies' betas are measured relative to that of the overall market and

17   adjusted upward by *Value Line*. The market beta is considered to be 1.0. For

18   companies that have betas greater than 1, they are regarded as having more risk than

19   the overall market. For companies that have betas less than 1, they are regarded to

20   have risk less than the overall market.

1   For these reasons, utility companies which consistently and predictably have

2   adjusted betas far less than 1 (usually in the range of 0.5 to 0.8 depending on market

3   conditions) are generally reflective of lower risk investment options.

4   **Q   CAN MR. MCKENZIE'S CAPM ANALYSIS BE ADJUSTED TO PRODUCE**

5   **MORE REASONABLE RESULTS?**

6   A   Yes.   While I am concerned with Mr. McKenzie's projected interest rate of 4.0%,

7   eliminating his size adjustments and using a more reasonable market risk premium can

8   correct his grossly overstated CAPM returns. For example, using my high-end market

9   risk premium of 7.8% and eliminating the size adjustments will produce average cost

10 of equity estimates of 8.2% and 9.1% for his current and projected CAPM analyses,

11 respectively.

12 **Q   DID MR. MCKENZIE ALSO PERFORM AN ECAPM ANALYSIS?**

13 A   Yes. Mr. McKenzie performed an ECAPM analysis that relied on the same market

14 risk premiums of 10.1% (current) and 9.2% (projected), the same current and

15 projected risk-free rates of 3.1% and 4.0%, respectively, and the same average *Value*

16 *Line* betas that he used in his current and projected CAPM analyses.

17   He then uses an ECAPM model that applies a 25% weighting factor to the

18 market beta of 1, and a 75% weighting factor to the utility beta. This produces an

19 ECAPM range of 10.5% to 10.8%.

1   Finally, Mr. McKenzie applied a size adjustment of approximately 0.45% to

2   his ECAPM estimates. His size-adjusted range is 11.0% to 11.2%.[45]

3   **Q   ARE MR. MCKENZIE'S CURRENT AND PROJECTED ECAPM ANALYSES**

4   **REASONABLE?**

5   A   No. Mr. McKenzie's ECAPM analyses share all of the same flaws as his traditional

6   CAPM analyses. More importantly, Mr. McKenzie's proposal to apply an ECAPM

7   while using adjusted betas published by Value Line, as well as the long-term risk-free

8   rate further inflates his results. Mr. McKenzie's analysis and results should be

9   disregarded.

10 **Q   PLEASE EXPLAIN THE ISSUES YOU HAVE WITH MR. MCKENZIE'S**

11   **CURRENT AND PROJECTED ECAPM ANALYSES.**

12 A   Mr. McKenzie's ECAPM analysis is flawed because his model was developed using

13   adjusted utility betas. An ECAPM analysis flattens the security market line, and is

14   designed for raw beta estimates, not adjusted betas such as the ones published by

15   *Value Line*. Beta adjustments, on their own, accomplish virtually the same thing as an

16   ECAPM analysis. They flatten the security market line, and increase the intercept at

17   the risk-free rate. ECAPM analysis is not designed to be used with adjusted betas, but

18   rather is designed to be used with unadjusted betas. Mr. McKenzie's proposal to use

19   adjusted betas within an ECAPM analysis is unreasonable and double counts the

20   attempt to flatten the security market line and increase CAPM return estimates for

---

[45]Exhibit No. 8.

1   companies with betas below 1, and decrease CAPM return estimates for companies

2   with betas greater than 1.

3   **Q**   **DO YOU HAVE ANY ADDITIONAL COMMENTS REGARDING THE**

4   **ECAPM AND ADJUSTED BETAS?**

5   **A**   Yes. The notion that an adjustment to beta is only a horizontal axis adjustment is not

6   true. The *Value Line* beta adjustment alters the CAPM return at both the vertical axis

7   (the intercept point) and the horizontal axis, the slope of the CAPM return line (along

8   the horizontal axis). This is depicted in Figure 3 below.

9   As shown in Figure 3, I have modeled the expected returns at various levels of

10   raw beta using both the traditional CAPM and ECAPM methodologies assuming a

11   risk-free rate of 3.50%, and a market risk premium of 7.50%. I also show the

12   expected CAPM and ECAPM returns using the associated adjusted (*Value Line*) beta

13   estimates for each raw beta estimate. As shown in Figure 3 below, the impact on the

14   traditional CAPM return using a raw beta and a traditional CAPM using an adjusted

15   beta has the effect of increasing the intercept point at a zero raw beta (y axis) from: (1)

16   risk-free rate to (2) the combination of the risk-free rate plus 35% of the market risk

17   premium. Further, as the unadjusted beta is increased above zero, the adjusted beta

18   increases the CAPM return when the raw beta is less than one, and decreases the

19   CAPM return when the raw beta is greater than one. In other words, the beta

20   adjustment raises the CAPM return at the vertical axis point and flattens the security

21   market across the horizontal axis as the raw beta increases above zero.

1   The ECAPM using raw betas has the same impact on the traditional CAPM

2   using an adjusted beta: the ECAPM increases the CAPM return at a zero raw beta

3   from: (1) the risk-free rate, to (2) the risk-free rate plus 25% of the market risk

4   premium. Further, the ECAPM using raw betas flattens the traditional CAPM return

5   line across the horizontal axis as the raw betas increase above zero.

Figure 3
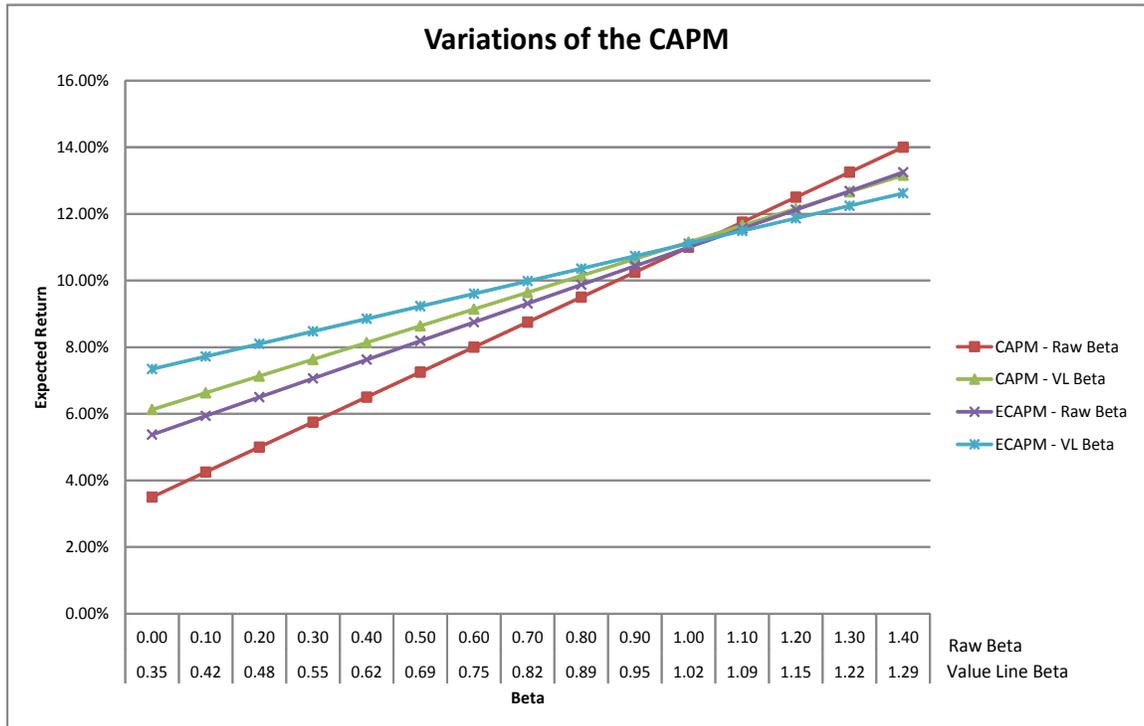
Assumptions:
Market Risk Premium is 7.50%
Risk-Free Rate is 3.50%

6   As shown in the graph above, compared to the traditional CAPM using a raw

7   beta, the traditional CAPM using an adjusted beta raises the intercept point (a y axis

8   impact) and flattens the slope of the security market line (an x axis impact). Similarly,

9   using a raw beta estimate, the ECAPM raises the intercept point at the y axis and

10   flattens the CAPM return for all raw beta estimates.

1   Significantly, if an adjusted beta is used in an ECAPM return model, the

2   CAPM return at the y axis increases from: (1) the risk-free rate, up to (2) the risk-free

3   rate plus approximately 51% of the market risk premium. Further, the CAPM return

4   for betas less than one starts at an inflated y axis intercept point and increases as the

5   raw beta increases above zero.

6   Mathematically, *Value Line*'s beta adjustments produce nearly the same effect

7   on the estimated CAPM return as does an ECAPM using a raw beta. Using an

8   adjusted beta in an ECAPM model, as Mr. McKenzie has proposed, produces a flawed

9   and inflated CAPM return estimate.

10 **Q   IS   THERE   ANY   ACADEMIC   SUPPORT   FOR   MR.   MCKENZIE'S**

11 **PROPOSED USE OF AN ADJUSTED BETA IN AN ECAPM STUDY?**

12 A   No. I am unaware of any peer reviewed academic study showing that the empirical

13 CAPM is more accurate using adjusted betas. To my knowledge, the ECAPM has

14 been tested and published with raw beta estimates. Further, Mr. McKenzie has not

15 provided any academic research that was subjected to academic peer review which

16 supports her proposed use of an adjusted beta in an ECAPM study. As such, the

17 practice of using an adjusted beta in an ECAPM study is simply not supported by

18 academic research. There is, however, considerable academic support for the use of a

19 raw beta in an ECAPM study. For the reasons outlined above, Mr. McKenzie's

20 ECAPM analyses should be rejected.

1   **Q**   **PLEASE DESCRIBE MR. MCKENZIE'S UTILITY RISK PREMIUM**

2   **ANALYSIS.**

3   A   Mr. McKenzie's utility bond yield versus authorized return on common equity risk

4   premium is shown in his Exhibit No. 9. As shown on page 3 of this exhibit, Mr.

5   McKenzie estimated an annual equity risk premium by subtracting Moody's utility

6   bond yield from the electric utility regulatory commission authorized return on

7   common equity over the period 1974 through 2017. Based on this analysis, Mr.

8   McKenzie estimates an average indicated equity risk premium over utility bond yields

9   of 3.71%.

10   Mr. McKenzie then adjusts this average equity risk premium using a regression

11   analysis based on an expectation that there is an ongoing inverse relationship between

12   interest rates and equity risk premiums. Using this regression analysis, Mr. McKenzie

13   increases his equity risk premium from 3.71%, up to 5.44% and 4.72% relative to

14   current and projected Baa-rated bond yields.[46] He then adds these inflated equity risk

15   premiums to the current and his projected Baa-rated utility bond yield of 4.60% to

16   6.26%, to produce a return on equity of 10.04% to 10.98%.[47]

17   Mr. McKenzie's risk premium analysis is overstated because of a highly

18   suspect and inflated projected Baa-rated bond yield of 6.26%, and his development of

19   risk premiums is based on the flawed and incomplete assumption that equity risk

20   premiums change by only changes in interest rates. Academic literature is clear that

21   equity risk premiums change based on differences in the perceived risk of equity

---

[46]Exhibit No. 9.
[47]*Id.*

1   securities versus bond securities, not simply caused by only changes in nominal

2   interest rates.

3 **Q**   **DO YOU HAVE ANY COMMENTS CONCERNING MR. MCKENZIE'S**

4   **PROJECTED UTILITY YIELD OF 6.26%?**

5 **A**   Yes. Mr. McKenzie uses a projected AA-rated utility bond yield for the period 2019

6   through 2023 in the range of 5.37% to 6.01%, with a midpoint of 5.69%. He then

7   measures the current average Baa-utility bond yield spread over the AA utility bond

8   yield. This spread is 0.57%. He then adds this current yield spread 0.57% to the

9   projected AA-utility bond yield of 5.69% to produce his projected yield of 6.26%.[48]

10   This projected yield is incomplete.   Current AA-rated utility bond yields are

11   approximately 4.0% as of the 13-week period ending February 3, 2017.   Mr.

12   McKenzie's projected increase to AA-rated utility bond yields does not reflect

13   consensus market outlooks.

14 **Q**   **WHY IS MR. MCKENZIE'S USE OF ONLY A SIMPLE INVERSE**

15   **RELATIONSHIP BETWEEN INTEREST RATES AND EQUITY RISK**

16   **PREMIUMS UNREASONABLE?**

17 **A**   Mr. McKenzie's belief that there is a simple inverse relationship between equity risk

18   premiums and interest rates is unsupported by academic research. While academic

19   studies have shown that, in the past, there has been an inverse relationship with these

20   variables, researchers have found that the relationship changes over time and is

---

[48]McKenzie Direct Testimony at 40.

1   influenced by changes in perception of the risk of bond investments relative to equity

2   investments, and not simply changes to interest rates.[49]

3   In the 1980s, equity risk premiums were inversely related to interest rates, but

4   that was likely attributable to the interest rate volatility that existed at that time.

5   Interest rate volatility currently is much lower than it was in the 1980s.[50] As such,

6   when interest rates were more volatile, the relative perception of bond investment risk

7   increased relative to the investment risk of equities. This changing investment risk

8   perception caused changes in equity risk premiums.

9   In today's marketplace, interest rate variability is not as extreme as it was

10   during the 1980s. Nevertheless, changes in the perceived risk of bond investments

11   relative to equity investments still drive changes in equity premiums. However, a

12   relative investment risk differential cannot be measured simply by observing nominal

13   interest rates. Changes in nominal interest rates are highly influenced by changes to

14   inflation outlooks, which also change equity return expectations. As such, the relevant

15   factor needed to explain changes in equity risk premiums is the relative changes to the

16   risk of equity versus debt securities investments, not simply changes to interest rates.

17   Importantly, Mr. McKenzie's analysis ignores investment risk differentials.

18   He bases his adjustment to the equity risk premium exclusively on changes in nominal

19   interest rates. This is a flawed methodology and does not produce accurate or reliable

20   risk premium return on equity estimates. His results should be rejected by the

21   Commission.

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[49]"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.
        [50]*Duff & Phelps, 2016 SBBI Yearbook* at 6-7 to 6-10.

1 **Q** **CAN MR. MCKENZIE'S RISK PREMIUM ANALYSES BASED ON**

2 **PROJECTED YIELDS BE MODIFIED TO PRODUCE MORE REASONABLE**

3 **RESULTS?**

4 **A** Yes. By eliminating the inverse relationship adjustment to the equity risk premium of

5 3.71% and the current Baa-rated utility yield of 4.94%, will result in a risk premium

6 return on equity of 8.65% (3.71% + 4.94%), rounded to 8.7%. Importantly, Mr.

7 McKenzie's projected Baa-rated bond yield of 6.26% effectively says that he expects

8 Baa-rated bond yields to increase by 132 basis points higher than the current

9 observable market Baa-rated bond yield of 4.94%. A near-term forecasted spread of

10 that magnitude is unreasonable and should not be relied upon.

11 **Q** **PLEASE DESCRIBE MR. MCKENZIE'S EXPECTED EARNINGS**

12 **ANALYSIS.**

13 **A** Mr. McKenzie's expected earnings analysis is based on *Value Line*'s projected earned

14 return on book equities for his proxy group, adjusted to reflect average year equity

15 returns. Based on a review of projected earnings over the next three to five years, Mr.

16 McKenzie estimates a return on equity for the Companies in the range of 11.1% to

17 11.3% (Exhibit No. 10).

18 **Q** **IS THE EXPECTED EARNINGS ANALYSIS A REASONABLE METHOD**

19 **FOR ESTIMATING A FAIR RETURN ON EQUITY FOR LG&E AND KU?**

20 **A** No. An expected earnings analysis does not measure the return an investor requires in

21 order to make an investment. In other words, the accounting measure of the earned

1   return on equity does not measure the opportunity cost of capital. Rather, it measures

2   the earned return on book equity that companies have experienced in the past or are

3   projected to achieve in the future. The returns investors require in order to assume the

4   risk of an investment are measured from prevailing stock market prices.

5   Additionally, the historical and projected earned return on equity for these

6   holding companies can be significantly influenced by the financial performance of

7   nonregulated operations.   For these reasons, Mr. McKenzie's expected earnings

8   analysis should be disregarded.

9 **Q   DO YOU HAVE ANY ADDITIONAL COMMENTS IN REGARDS TO MR.**

10   **MCKENZIE'S RETURN ESTIMATES?**

11 A   Yes. Mr. McKenzie also performed a DCF model on a non-utility proxy group, which

12   he found to be a reasonable risk proxy for LG&E and KU. The DCF results of his

13   non-utility group range are presented on Exhibit No. 12. The average adjusted DCF

14   result was 10.5%. While Mr. McKenzie did not rely on the results of his non-utility

15   DCF analysis in arriving at his recommended range of reasonableness,[51] he did opine

16   that the analysis is relevant in evaluating a fair ROE for the Companies.[52] I disagree

17   with his assessment. However, because Mr. McKenzie did not rely on these results in

18   developing his inflated recommendation, I will not comment on his non-utility

19   analysis any further.

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[51] McKenzie Direct at 74.
[52] *Id.*

1   **Q**   **WHAT IS YOUR CONCLUSION REGARDING THE APPROPRIATE**

2   **RETURN ON EQUITY FOR LG&E AND KU BASED ON YOUR ANALYSIS?**

3   A   My analysis supports a reasonable range of the Companies' current cost of market

4   equity to be from 9.00% to 9.70%, with an unbiased midpoint estimate of 9.35%.

5   Further, the Commission should reject Mr. McKenzie's recommended cost of

6   common equity for the reasons outlined above, primarily because his analysis has

7   artificially inflated the Companies' of equity through unreasonable adjustments.

8   **Q**   **DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

9   A   Yes, it does.

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,

3   Suite 140, Chesterfield, MO 63017.

4   **Q**   **PLEASE STATE YOUR OCCUPATION.**

5   A   I am a Senior Consultant in the field of public utility regulation with the firm of

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

7   **Q**   **PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND**

8   **PROFESSIONAL EMPLOYMENT EXPERIENCE.**

9   A   I graduated from Southern Illinois University Edwardsville in 2008 where I received a

10   Bachelor of Science Degree in Business Economics and Finance. I graduated with a

11   Master of Business Administration Degree from Lindenwood University in 2011.

12   In January 2009, I accepted the position Financial Representative with

13   American General Finance and was promoted to Senior Assistant Manager. In this

14   position I was responsible for assisting in the management of daily operations of the

15   branch, analyzing and reporting on the performance of the branch to upper

16   management, performing credit analyses for consumers and small businesses, as well

17   as assisting home buyers obtain mortgage financing.

18   In January 2011, I accepted the position of Analyst with BAI. As an Analyst, I

19   performed detailed analysis, research, and general project support on regulatory and

1   competitive procurement projects. In July 2013, I was promoted to the position of

2   Associate Consultant. In January 2016, I was promoted to Consultant. In January

3   2018, I was promoted to Senior Consultant. As a Senior Consultant, I perform

4   detailed technical analyses and research to support regulatory projects including expert

5   testimony, and briefing assistance covering various regulatory issues. At BAI, I have

6   been involved with several regulated projects for electric, natural gas and water and

7   wastewater utilities, as well as competitive procurement of electric power and gas

8   supply. My regulatory filing tasks have included measuring the cost of capital, capital

9   structure evaluations, assessing financial integrity, merger and acquisition related

10   issues, risk management related issues, depreciation rate studies, other revenue

11   requirement issues and wholesale market and retail regulated power price forecasts.

12   Since 2011, I have been working with BAI witnesses on utility rate of return filings.

13   Specifically, I have assisted in analyzing rate of return studies, drafting discovery

14   requests and analyzing responses, drafting testimony and exhibits and assisting with

15   the review of the briefs in more than 30 states, two Canadian provinces, and the

16   Federal Energy Regulatory Commission ("FERC").

17   BAI was formed in April 1995. BAI and its predecessor firm have participated

18   in more than 700 regulatory proceedings in 40 states and Canada.

19   BAI provides consulting services in the economic, technical, accounting, and

20   financial aspects of public utility rates and in the acquisition of utility and energy

21   services through RFPs and negotiations, in both regulated and unregulated markets.

22   Our clients include large industrial and institutional customers, some utilities and, on

1   occasion, state regulatory agencies. We also prepare special studies and reports,

2   forecasts, surveys and siting studies, and present seminars on utility-related issues.

3   In general, we are engaged in energy and regulatory consulting, economic

4   analysis and contract negotiation. In addition to our main office in St. Louis, the firm

5   also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

6 **Q   HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?**

7 A   Yes. I have sponsored testimony before state regulatory commissions including:

8   Arkansas, Delaware, Florida, Illinois, Kansas, Kentucky, Louisiana, Michigan,

9   Minnesota, Ohio, Oklahoma, and Utah. I have also filed an affidavit before the FERC.

10 **Q   PLEASE DESCRIBE ANY PROFESSIONAL REGISTRATIONS OR**

11   **ORGANIZATIONS TO WHICH YOU BELONG.**

12 A   I earned the Chartered Financial Analyst ("CFA") designation from the CFA Institute.

13   The CFA charter was awarded after successfully completing three examinations which

14   covered the subject areas of financial accounting and reporting analysis, corporate

15   finance, economics, fixed income and equity valuation, derivatives, alternative

16   investments, risk management, and professional and ethical conduct. I am a member

17   of the CFA Institute and the CFA Society of St. Louis.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:)) ELECTRONIC APPLICATION OF KENTUCKY) UTILITIES COMPANY FOR AN ADJUSTMENT) OF ITS ELECTRIC RATES))	Case No. 2018-00294
In the Matter of:)) ELECTRONIC APPLICATION OF LOUISVILLE) GAS AND ELECTRIC COMPANY FOR AN) ADJUSTMENT OF ITS ELECTRIC AND GAS) RATES))	Case No. 2018-00295

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 constitute the direct testimony of Affiant in the above-styled case. 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 16th day of January, 2019.

_____
Notary Public
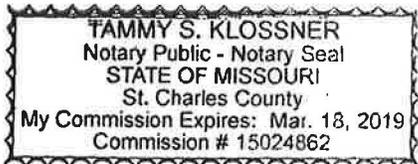
BRUBAKER & ASSOCIATES, INC.

Exhibit CCW-1

Valuation Metrics

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Electric Utilities
(Valuation Metrics)

Price to Earnings (P/E) Ratio [1]

Line	Company	17-Year Average (1)	2018 [2] (2)	2017 (3)	2016 (4)	2015 (5)	2014 (6)	2013 (7)	2012 (8)	2011 (9)	2010 (10)	2009 (11)	2008 (12)	2007 (13)	2006 (14)	2005 (15)	2004 (16)	2003 (17)	2002 (18)
1	ALLETE	17.78	23.20	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	16.10	21.10	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.	15.85	22.20	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	14.24	20.60	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.	27.15	19.90	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.	18.43	25.90	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	17.70	18.10	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	15.10	23.00	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.	17.11	22.90	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	15.39	18.00	19.77	18.80	15.59	15.90	14.72	15.39	15.08	13.30	12.55	12.29	13.78	15.49	15.13	18.21	14.30	13.28
11	Dominion Resources	17.96	16.60	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	15.56	19.70	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	16.92	17.70	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	13.97	14.80	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	17.42	22.50	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.	13.76	18.80	15.01	10.92	12.53	12.89	13.21	11.22	9.06	11.57	11.98	16.56	19.30	14.28	16.28	15.09	13.77	11.53
17	Eversource Energy	17.65	19.00	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.	21.70	21.70	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.	14.42	14.80	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.	17.31	17.80	15.91	11.41	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.	19.02	16.80	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	15.52	N/A	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.	18.02	18.60	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.	16.33	22.90	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	18.62	25.60	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.	16.15	21.20	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	16.79	17.10	17.85	17.19	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	15.17	19.70	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.	24.14	21.60	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.	16.79	NMF	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	15.73	18.90	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	18.02	21.40	20.43	19.83	16.85	18.68	16.13	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	16.36	19.40	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.	14.22	13.20	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	13.57	17.30	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.	15.01	31.80	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	14.94	19.70	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.	15.69	15.80	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.	17.72	28.50	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	16.28	21.90	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	15.58	N/A	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.	16.92	19.50	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	16.48	20.24	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	15.81	19.70	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 21, 2018.
[2] The Value Line Investment Survey, October 26, November 16, and December 14, 2018.

Louisville Gas and Electric Company
Kentucky Utilities Company

Electric Utilities
(Valuation Metrics)

Market Price to Cash Flow (MP/CF) Ratio [1]

Line	Company	17-Year Average (1)	2018 [2/a] (2)	2017 (3)	2016 (4)	2015 (5)	2014 (6)	2013 (7)	2012 (8)	2011 (9)	2010 (10)	2009 (11)	2008 (12)	2007 (13)	2006 (14)	2005 (15)	2004 (16)	2003 (17)	2002 (18)
1	ALLETE	9.46	10.91	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	7.64	9.70	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.	6.90	7.97	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	6.26	8.26	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.	9.95	9.78	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.	6.70	10.04	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	7.60	8.55	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	4.99	7.49	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.	5.62	8.30	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	8.21	9.02	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	9.34	9.88	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	6.20	8.48	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	7.57	7.31	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	5.31	5.72	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	5.89	8.72	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.	5.71	4.98	4.66	4.01	4.11	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	6.64	8.95	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.	11.91	11.91	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.	6.11	4.56	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.	6.35	8.76	4.76	5.12	5.38	7.42	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.	8.18	7.95	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	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.	7.96	8.51	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.	8.11	11.63	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	11.10	14.90	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.	7.54	10.73	11.62	9.23	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	7.57	8.01	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	7.76	9.47	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.	9.19	10.70	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.	6.28	6.79	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	6.11	7.95	8.73	7.89	6.91	7.03	6.85	6.34	5.80	5.80	3.84	4.19	4.76	4.48	7.48	5.88	4.80	5.21
32	PNM Resources	6.69	6.98	7.40	7.64	6.95	7.48	6.47	5.80	4.94	4.58	4.53	7.10	10.67	7.50	7.62	6.84	5.55	5.72
33	Portland General	5.70	6.66	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.	7.45	7.04	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	7.41	9.03	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.	7.15	8.14	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	7.76	10.40	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.	8.14	7.17	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.	7.30	10.92	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	8.41	10.97	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	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.	6.46	7.79	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	7.20	8.78	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	7.07	8.53	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 21, 2018.
[2] The Value Line Investment Survey, October 26, November 16, and December 14, 2018.
Note:
[a] Based on the average of the high and low price for 2018 and the projected 2018 Cash Flow per share,
   published in The Value Line Investment Survey, October 26, November 16, and December 14, 2018.

Louisville Gas and Electric Company
Kentucky Utilities Company

Electric Utilities
(Valuation Metrics)

Market Price to Book Value (MP/BV) Ratio [1]

Line	Company	14-Year Average (1)	2018 [2/b] (2)	2017 (3)	2016 (4)	2015 (5)	2014 (6)	2013 (7)	2012 (8)	2011 (9)	2010 (10)	2009 (11)	2008 (12)	2007 (13)	2006 (14)	2005 (15)
1	ALLETE	1.59	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	1.66	2.06	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.	1.40	1.96	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	1.52	1.84	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.	0.87	1.01	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.	1.31	1.84	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	1.48	1.60	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	2.39	2.09	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.	1.94	2.77	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	1.40	1.51	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	2.65	2.46	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	1.45	1.92	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	1.18	1.30	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	1.65	1.74	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	1.56	1.92	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.	1.72	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	1.41	1.63	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.	1.60	1.60	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.	2.28	1.26	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.	1.88	2.92	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.	1.48	1.29	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	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.	1.61	1.71	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.	1.38	1.95	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	2.03	2.53	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.	1.98	2.34	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	1.45	1.47	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	1.83	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.	1.76	2.37	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.	1.56	1.14	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	1.38	1.72	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	1.16	1.70	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	1.28	1.55	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.	2.14	1.72	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	1.91	1.80	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.	1.48	1.11	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	1.78	2.11	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	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.	1.90	2.82	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	1.88	2.14	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	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.	1.54	1.91	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	1.66	1.85	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	1.57	1.79	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 21, 2018.

[2] The Value Line Investment Survey, October 26, November 16, and December 14, 2018.
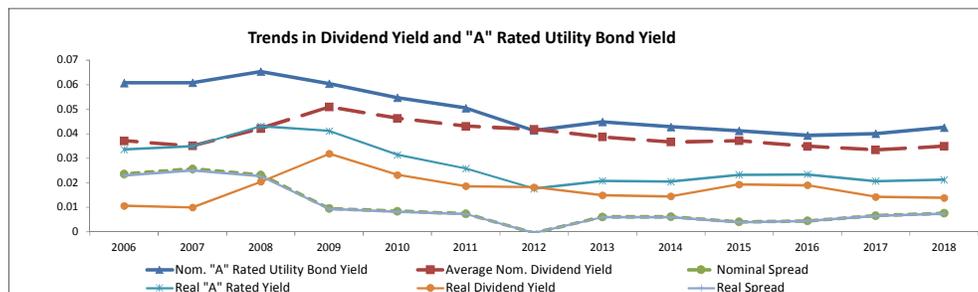
Notes:

[b] Based on the average of the high and low price for 2018 and the projected 2018 Book Value per share, published in The Value Line Investment Survey, October 26, November 16, and December 14, 2018.

Louisville Gas and Electric Company
Kentucky Utilities Company

Electric Utilities
(Valuation Metrics)

							Dividend Yield[1]								
Line	Company	13-Year Average (1)	2018 [2/a] (2)	2017 (3)	2016 (4)	2015 (5)	2014 (6)	2013 (7)	2012 (8)	2011 (9)	2010 (10)	2009 (11)	2008 (12)	2007 (13)	2006 (14)
1	ALLETE	4.03%	3.00%	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	3.82%	3.21%	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.	4.63%	3.01%	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	4.15%	3.56%	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.	3.85%	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.	3.76%	2.97%	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	3.84%	3.32%	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	4.57%	4.12%	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.	3.32%	3.05%	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	4.51%	3.67%	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	3.98%	4.66%	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	4.24%	3.33%	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	4.79%	4.63%	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	3.02%	3.81%	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	2.74%	2.52%	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.	4.13%	4.44%	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	3.36%	3.42%	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.	3.11%	3.11%	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.	3.92%	3.42%	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.	4.35%	4.22%	4.62%	4.31%	4.23%	4.26%	4.26%	4.90%	5.23%	5.76%	5.09%	3.21%	3.12%	3.40%
21	Fortis Inc.	3.68%	4.04%	3.69%	3.80%	3.76%	3.88%	3.84%	3.64%	3.58%	3.80%	4.21%	3.76%	3.01%	2.79%
22	Great Plains Energy	4.52%	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.	4.75%	3.64%	3.65%	3.99%	4.76%	4.76%	4.72%	4.70%	5.04%	5.51%	6.89%	5.00%	5.18%	4.59%
24	IDACORP, Inc.	3.27%	2.64%	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	3.29%	2.21%	1.95%	2.23%	2.78%	2.78%	2.91%	2.91%	3.25%	3.63%	3.98%	4.36%	4.14%	4.25%
26	NextEra Energy, Inc.	3.22%	2.76%	2.79%	2.91%	3.01%	3.00%	3.30%	3.65%	3.96%	3.90%	3.55%	3.02%	2.65%	3.40%
27	NorthWestern Corp	4.15%	3.92%	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	3.62%	3.99%	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.	4.27%	3.02%	3.12%	3.87%	4.14%	4.11%	4.11%	4.22%	5.57%	5.68%	5.38%	3.63%	3.46%	3.92%
30	PG&E Corp.	3.70%	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	4.62%	3.60%	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	3.32%	2.89%	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	3.75%	3.30%	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.	4.38%	5.68%	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	3.84%	3.50%	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.	4.22%	2.36%	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	2.94%	3.14%	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.	4.72%	5.19%	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.	4.26%	2.82%	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	3.06%	3.33%	3.31%	3.35%	3.49%	3.40%	3.49%	3.24%	3.35%	2.97%	3.16%	2.41%	2.14%	2.18%
41	Westar Energy	4.37%	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.	4.01%	3.33%	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**	**3.94%**	**3.50%**	**3.34%**	**3.49%**	**3.71%**	**3.66%**	**3.87%**	**4.18%**	**4.30%**	**4.63%**	**5.09%**	**4.21%**	**3.51%**	**3.71%**
44	Median	3.92%	3.33%	3.15%	3.43%	3.71%	3.76%	3.85%	4.18%	4.42%	4.76%	5.14%	4.21%	3.40%	3.60%
45	20-Yr Treasury Yields[3]	3.48%	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[3]	1.30%	0.92%	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[3]	2.15%	2.08%	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**	**1.75%**	**1.38%**	**1.42%**	**1.90%**	**1.93%**	**1.44%**	**1.49%**	**1.81%**	**1.86%**	**2.32%**	**3.18%**	**2.04%**	**0.99%**	**1.06%**
	Utility														
49	**Nominal "A" Rated Yield**	**4.95%**	**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**	**2.75%**	**2.13%**	**2.07%**	**2.34%**	**2.33%**	**2.04%**	**2.08%**	**1.76%**	**2.58%**	**3.13%**	**4.11%**	**4.31%**	**3.49%**	**3.36%**
	Spreads (Utility Bond - Stock)														
51	**Nominal Spread[b]**	**1.02%**	**0.76%**	**0.66%**	**0.44%**	**0.40%**	**0.61%**	**0.61%**	**-0.05%**	**0.74%**	**0.84%**	**0.95%**	**2.32%**	**2.57%**	**2.36%**
52	**Real Spread[c]**	**0.99%**	**0.74%**	**0.65%**	**0.44%**	**0.40%**	**0.60%**	**0.59%**	**-0.05%**	**0.72%**	**0.82%**	**0.93%**	**2.27%**	**2.50%**	**2.30%**
	Spreads (Treasury Bond - Stock)														
53	Nominal[f]	-0.46%	-0.47%	-0.69%	-1.26%	-1.17%	-0.59%	-0.75%	-1.64%	-0.68%	-0.60%	-0.98%	0.15%	1.40%	1.28%
54	Real[g]	-0.45%	-0.46%	-0.68%	-1.24%	-1.15%	-0.58%	-0.73%	-1.60%	-0.67%	-0.58%	-0.97%	0.15%	1.37%	1.25%

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 Yield; Real Spread

Sources:
[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 21, 2018.
[2] The Value Line Investment Survey, October 26, November 16, and December 14, 2018.
[3] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.
[4] www.moodys.com, Bond Yields and Key Indicators, through December 14, 2018.
Notes:
[a] Based on the average of the high and low price for 2017 and the projected 2017 Dividends Declared per share, published in the
Value Line Investment Survey, October 26, November 16, and December 14, 2018.
[b] The spread being measured here is the nominal A-rated utility bond yield over the average nominal utility dividend yield; Line 46 - Line 42).
[c] The spread being measured here is the real A-rated utility bond yield over the average real utility dividend yield; (Line 47 - Line 45).

Louisville Gas and Electric Company
Kentucky Utilities Company

Electric Utilities
(Valuation Metrics)

Line	Company	13-Year Average (1)	2018[2] (2)	2017 (3)	2016 (4)	2015 (5)	2014 (6)	2013 (7)	2012 (8)	2011 (9)	2010 (10)	2009 (11)	2008 (12)	2007 (13)	2006 (14)
								Dividend per Share[1]							
1	ALLETE	1.87	2.24	2.14	2.08	2.02	1.96	1.90	1.84	1.78	1.76	1.76	1.72	1.64	1.45
2	Alliant Energy	0.93	1.34	1.26	1.18	1.10	1.02	0.94	0.90	0.85	0.79	0.75	0.70	0.64	0.58
3	Ameren Corp.	1.85	1.85	1.78	1.72	1.66	1.61	1.60	1.60	1.56	1.54	1.54	2.54	2.54	2.54
4	American Electric Power	1.93	2.53	2.39	2.27	2.15	2.03	1.95	1.88	1.85	1.71	1.64	1.64	1.58	1.50
5	Avangrid, Inc.	1.73	1.74	1.73	1.73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.08	1.49	1.43	1.37	1.32	1.27	1.22	1.16	1.10	1.00	0.81	0.69	0.60	0.57
7	Black Hills	1.54	1.90	1.81	1.68	1.62	1.56	1.52	1.48	1.46	1.44	1.42	1.40	1.37	1.32
8	CenterPoint Energy	0.88	1.11	1.35	1.03	0.99	0.95	0.83	0.81	0.79	0.78	0.76	0.73	0.68	0.60
9	CMS Energy Corp.	0.90	1.43	1.33	1.24	1.16	1.08	1.02	0.96	0.84	0.66	0.50	0.36	0.20	N/A
10	Consol. Edison	2.49	2.86	2.76	2.68	2.60	2.52	2.46	2.42	2.40	2.38	2.36	2.34	2.32	2.30
11	Dominion Resources	2.19	3.34	3.04	2.80	2.59	2.40	2.25	2.11	1.97	1.83	1.75	1.58	1.46	1.38
12	DTE Energy	2.58	3.59	3.36	3.06	2.84	2.69	2.42	2.42	2.18	2.12	2.12	2.12	2.12	2.08
13	Duke Energy	3.08	3.64	3.49	3.36	3.24	3.15	3.09	3.03	2.97	2.91	2.82	2.70	2.58	N/A
14	Edison Int'l	1.53	2.45	2.23	1.98	1.73	1.48	1.37	1.31	1.29	1.27	1.25	1.23	1.18	1.10
15	El Paso Electric	1.11	1.42	1.32	1.23	1.17	1.11	1.05	0.97	0.66	N/A	N/A	N/A	N/A	N/A
16	Entergy Corp.	3.16	3.58	3.50	3.42	3.34	3.32	3.32	3.32	3.32	3.24	3.00	3.00	2.58	2.16
17	Eversource Energy	1.32	2.02	1.90	1.78	1.67	1.57	1.47	1.32	1.10	1.03	0.95	0.83	0.78	0.73
18	Evergy, Inc.	1.74	1.74	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Exelon Corp.	1.68	1.38	1.31	1.26	1.24	1.24	1.46	2.10	2.10	2.10	2.10	2.05	1.82	1.64
19	FirstEnergy Corp.	1.83	1.44	1.44	1.44	1.44	1.44	1.65	2.20	2.20	2.20	2.20	2.20	2.05	1.85
20	Fortis Inc.	1.23	1.75	1.65	1.55	1.43	1.30	1.25	1.21	1.17	1.12	1.04	1.00	0.82	0.67
21	Great Plains Energy	1.11	N/A	1.10	1.06	1.00	0.94	0.88	0.86	0.84	0.83	0.83	1.66	1.66	1.66
22	Hawaiian Elec.	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
23	IDACORP, Inc.	1.58	2.40	2.24	2.08	1.92	1.76	1.57	1.37	1.20	1.20	1.20	1.20	1.20	1.20
24	MGE Energy	1.07	1.32	1.26	1.21	1.16	1.11	1.07	1.04	1.01	0.99	0.97	0.96	0.94	0.93
25	NextEra Energy, Inc.	2.61	4.44	3.93	3.48	3.08	2.90	2.64	2.40	2.20	2.00	1.89	1.78	1.64	1.50
26	NorthWestern Corp	1.60	2.20	2.10	2.00	1.92	1.60	1.52	1.48	1.44	1.36	1.34	1.32	1.28	1.24
27	OGE Energy	0.90	1.40	1.27	1.16	1.05	0.95	0.85	0.80	0.76	0.73	0.71	0.70	0.68	0.67
28	Otter Tail Corp.	1.21	1.34	1.28	1.25	1.23	1.21	1.19	1.19	1.19	1.19	1.19	1.19	1.17	1.15
29	PG&E Corp.	1.70	Nil	1.55	1.93	1.82	1.82	1.82	1.82	1.82	1.82	1.68	1.56	1.44	1.32
30	Pinnacle West Capital	2.33	2.86	2.70	2.56	2.44	2.33	2.23	2.67	2.10	2.10	2.10	2.10	2.10	2.03
31	PNM Resources	0.74	1.08	0.99	0.88	0.80	0.76	0.68	0.58	0.50	0.50	0.50	0.61	0.91	0.86
32	Portland General	1.09	1.43	1.34	1.26	1.18	1.12	1.10	1.08	1.06	1.04	1.01	0.97	0.93	0.68
33	PPL Corp.	1.42	1.64	1.58	1.52	1.50	1.49	1.47	1.44	1.40	1.40	1.38	1.34	1.22	1.10
34	Public Serv. Enterprise	1.44	1.80	1.72	1.64	1.56	1.48	1.44	1.42	1.37	1.37	1.33	1.29	1.17	1.14
35	SCANA Corp.	1.92	0.98	2.45	2.30	2.18	2.10	2.03	1.98	1.94	1.90	1.88	1.84	1.76	1.68
36	Sempra Energy	2.24	3.58	3.29	3.02	2.80	2.64	2.52	2.40	1.92	1.56	1.56	1.37	1.24	1.20
37	Southern Co.	1.95	2.38	2.30	2.22	2.15	2.08	2.01	1.94	1.87	1.80	1.73	1.66	1.60	1.54
38	Vectren Corp.	1.45	1.83	1.71	1.62	1.54	1.46	1.43	1.41	1.39	1.37	1.35	1.31	1.27	1.23
39	WEC Energy Group	1.25	2.21	2.08	1.98	1.74	1.56	1.45	1.20	1.04	0.80	0.68	0.54	0.50	0.46
40	Westar Energy	1.30	N/A	1.60	1.52	1.44	1.40	1.36	1.32	1.28	1.24	1.20	1.16	1.08	0.98
41	Xcel Energy Inc.	1.13	1.52	1.44	1.36	1.28	1.20	1.11	1.07	1.03	1.00	0.97	0.94	0.91	0.88
42	**Average**	**1.61**	**2.06**	**1.97**	**1.86**	**1.76**	**1.67**	**1.61**	**1.59**	**1.51**	**1.47**	**1.42**	**1.42**	**1.36**	**1.27**
43	**Industry Average Growth**	**4.12%**	**4.72%**	**6.14%**	**5.60%**	**5.24%**	**3.58%**	**1.23%**	**5.69%**	**2.49%**	**3.36%**	**-0.08%**	**5.06%**	**6.45%**	

Sources:
[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 21, 2018.
[2] The Value Line Investment Survey, October 26, November 16, and December 14, 2018.
Notes:
PG&E is excluded from 2017 and 2018 average calculations due to their Dividend Suspension.

Louisville Gas and Electric Company
Kentucky Utilities Company

Electric Utilities
(Valuation Metrics)

Earnings per Share[1]

Line	Company	13-Year Average (1)	2018[2] (2)	2017 (3)	2016 (4)	2015 (5)	2014 (6)	2013 (7)	2012 (8)	2011 (9)	2010 (10)	2009 (11)	2008 (12)	2007 (13)	2006 (14)
1	ALLETE	2.81	3.35	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	1.52	2.15	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.	2.66	3.35	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	3.25	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.	1.68	2.20	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.	1.65	1.90	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	2.29	3.45	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	1.21	0.90	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.	1.50	2.35	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	3.67	4.20	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	2.97	3.75	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	4.03	6.15	5.73	4.83	4.44	5.10	3.76	3.88	3.67	3.24	2.73	2.66	2.45
13	Duke Energy	3.78	4.40	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	3.82	4.35	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	2.06	2.55	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.	5.95	5.00	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	2.27	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.	2.50	2.50	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.	3.04	2.50	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.	2.68	1.15	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.	1.77	2.60	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	-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.	1.49	1.90	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.	3.27	4.30	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	1.89	2.45	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.	4.99	7.50	6.50	5.78	6.06	5.60	4.83	4.56	4.82	4.74	3.97	4.07	3.27	3.23
27	NorthWestern Corp	2.47	3.50	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	1.65	2.10	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.	1.33	2.15	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.	2.56	0.60	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	3.39	4.40	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	1.26	1.90	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	1.88	2.30	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.	2.35	2.50	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	2.80	3.00	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.	3.18	1.80	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	4.55	5.65	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.	2.60	2.90	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.	1.97	2.45	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	2.25	3.35	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	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.	1.83	2.45	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**	**2.60**	**3.14**	**3.02**	**2.91**	**2.78**	**2.77**	**2.60**	**2.51**	**2.53**	**2.45**	**2.26**	**2.29**	**2.32**	**2.17**
44	**Indsutry Average Growth**	**3.17%**	**4.08%**	**3.68%**	**4.86%**	**0.28%**	**6.70%**	**3.34%**	**-0.86%**	**3.54%**	**8.08%**	**-1.11%**	**-1.47%**	**6.98%**	

Sources:
[1] The Value Line Investment Survey Investment Analyzer Software, downloaded on June 21, 2018.
[2] The Value Line Investment Survey, October 26, November 16, and December 14, 2018.
Notes:
PG&E is excluded from 2017 and 2018 average calculations due to their Dividend Suspension.

Louisville Gas and Electric Company
Kentucky Utilities Company

Electric Utilities
(Valuation Metrics)

Line	Company	Cash Flow / Capital Spending			
		2017 (1)	2018 (2)	2019 (3)	3 - 5 yr Projection (4)
1	ALLETE	1.61x	1.09x	1.04x	1.22x
2	Alliant Energy	0.49x	0.59x	0.66x	0.93x
3	Ameren Corp.	0.75x	0.79x	0.68x	0.93x
4	American Electric Power	0.67x	0.69x	0.67x	0.76x
5	Avangrid, Inc.	0.57x	0.66x	0.72x	0.87x
6	Avista Corp.	0.77x	0.82x	0.88x	1.04x
7	Black Hills	1.17x	0.84x	0.73x	1.17x
8	CenterPoint Energy	1.22x	1.09x	1.23x	1.50x
9	CMS Energy Corp.	0.89x	0.76x	0.71x	1.12x
10	Consol. Edison	0.76x	0.69x	0.73x	0.93x
11	Dominion Resources	0.81x	0.99x	1.17x	1.27x
12	DTE Energy	0.94x	0.65x	0.97x	1.21x
13	Duke Energy	0.87x	0.71x	0.77x	1.13x
14	Edison Int'l	0.94x	0.85x	0.80x	0.90x
15	El Paso Electric	1.04x	0.95x	0.97x	1.07x
16	Entergy Corp.	0.76x	0.71x	0.74x	1.16x
17	Eversource Energy	0.79x	0.69x	0.65x	1.18x
18	Evergy, Inc.	N/A	1.02x	1.37x	1.64x
19	Exelon Corp.	1.06x	1.09x	1.38x	1.62x
20	FirstEnergy Corp.	1.03x	0.73x	1.05x	1.20x
21	Fortis Inc.	0.76x	0.74x	0.68x	0.97x
22	Hawaiian Elec.	0.81x	1.08x	1.02x	1.06x
23	IDACORP, Inc.	1.33x	1.25x	1.26x	1.37x
24	MGE Energy	1.19x	0.70x	0.67x	0.73x
25	NextEra Energy, Inc.	0.53x	0.75x	0.83x	1.01x
26	NorthWestern Corp	1.21x	1.23x	1.08x	1.32x
27	OGE Energy	0.81x	1.17x	1.29x	1.73x
28	Otter Tail Corp.	1.10x	1.51x	0.46x	2.18x
29	PG&E Corp.	0.82x	0.52x	0.83x	0.93x
30	Pinnacle West Capital	0.76x	0.89x	0.97x	1.14x
31	PNM Resources	0.84x	0.83x	0.87x	0.82x
32	Portland General	1.07x	0.88x	1.35x	1.65x
33	PPL Corp.	0.82x	0.83x	0.92x	1.46x
34	Public Serv. Enterprise	0.64x	0.80x	1.10x	1.36x
35	SCANA Corp.	0.86x	0.84x	0.79x	0.88x
36	Sempra Energy	0.67x	0.80x	0.93x	1.56x
37	Southern Co.	0.90x	0.77x	0.94x	1.43x
38	Vectren Corp.	0.82x	0.79x	0.81x	0.79x
39	WEC Energy Group	0.92x	0.78x	0.77x	0.91x
40	Xcel Energy Inc.	0.84x	0.72x	0.78x	1.07x
41	Average	0.89x	0.86x	0.91x	1.18x
42	Median	0.84x	0.80x	0.85x	1.13x

Sources:
The Value Line Investment Survey Investment Analyzer Software,
downloaded on July 9, 2018.
The Value Line Investment Survey, October 26, November 16,
and December 14, 2018.
Notes:
Based on the projected Cash Flow per share and Capital Spending per share.

Exhibit CCW-2

Proxy Group

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities 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	Alliant Energy Corporation	A-	Baa1	42.9%	51.0%
2	Ameren Corporation	BBB+	Baa1	45.6%	49.8%
3	Black Hills Corporation	BBB+	Baa2	33.2%	35.5%
4	CMS Energy Corporation	BBB+	Baa1	29.7%	32.4%
5	Consolidated Edison, Inc.	A-	Baa1	48.1%	51.1%
6	DTE Energy Company	BBB+	Baa1	41.5%	43.8%
7	Duke Energy Corporation	A-	Baa1	43.4%	46.0%
8	Entergy Corporation	BBB+	Baa2	32.1%	35.5%
9	Eversource Energy	A+	Baa1	44.9%	48.2%
10	Exelon Corporation	BBB	Baa2	44.1%	47.8%
11	NorthWestern Corporation	BBB	A3	45.7%	49.8%
12	PPL Corporation	A-	Baa2	33.6%	35.2%
13	Public Service Enterprise Group Incorporated	BBB+	Baa1	50.4%	53.4%
14	Sempra Energy	BBB+	Baa1	36.7%	43.5%
15	WEC Energy Group, Inc.	A-	Baa1	46.1%	51.9%
16	Xcel Energy Inc.	A-	A3	42.0%	44.1%
17	**Average**	**BBB+**	**Baa1**	**41.3%**	**44.9%**
18	**Louisville Gas and Electric Company**	**A-[3]**	**A3[3]**	**52.84%[4]**	
19	**Kentucky Utilities Company**	**A-[3]**	**A3[3]**	**52.84%[4]**	

Sources:
[1] S&P Global Market Intelligence, Downloaded on December 17, 2018.
[2] *The Value Line Investment Survey*, October 26, November 16, and December 14, 2018.
[3] McKenzie direct at 19.
[4] SCHEDULE J-1.1/J-1.2, page 1.

Exhibit CCW-3

Consensus Analysts' Growth Rates

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Consensus Analysts' Growth Rates

Line	Company	Zacks Estimated Growth %[1] (1)	Zacks Number of Estimates (2)	MI Estimated Growth %[2] (3)	MI Number of Estimates (4)	Reuters Estimated Growth %[3] (5)	Reuters Number of Estimates (6)	Average of Growth Rates[4] (7)
1	Alliant Energy Corporation	6.00%	N/A	6.00%	4	N/A	N/A	6.00%
2	Ameren Corporation	6.80%	N/A	6.53%	5	7.75%	2	7.03%
3	Black Hills Corporation	4.50%	N/A	4.69%	3	4.37%	2	4.52%
4	CMS Energy Corporation	6.20%	N/A	6.89%	8	7.08%	4	6.72%
5	Consolidated Edison, Inc.	4.00%	N/A	2.94%	4	2.87%	4	3.27%
6	DTE Energy Company	6.00%	N/A	5.83%	5	5.50%	4	5.78%
7	Duke Energy Corporation	5.00%	N/A	4.62%	7	4.41%	2	4.68%
8	Entergy Corporation	7.00%	N/A	2.91%	2	- 3.92%	2	4.96%
9	Eversource Energy	5.90%	N/A	5.99%	7	5.77%	4	5.89%
10	Exelon Corporation	4.60%	N/A	5.74%	6	4.49%	3	4.94%
11	NorthWestern Corporation	2.30%	N/A	1.97%	3	2.42%	2	2.23%
12	PPL Corporation	5.00%	N/A	4.13%	2	4.31%	1	4.48%
13	Public Service Enterprise Group Incorporated	6.70%	N/A	6.63%	4	7.26%	2	6.86%
14	Sempra Energy	8.10%	N/A	7.79%	3	8.59%	2	8.16%
15	WEC Energy Group, Inc.	4.40%	N/A	5.82%	4	4.67%	3	4.96%
16	Xcel Energy Inc.	5.80%	N/A	5.99%	5	6.49%	2	6.09%
17	**Average**	**5.52%**	**N/A**	**5.28%**	**5**	**5.43%**	**3**	**5.41%**

Sources:

[1] Zacks, http://www.zacks.com/, downloaded on December 17, 2018.

[2] S&P Global Market Intelligence, https://platform.mi.spglobal.com, downloaded on December 17, 2018.

[3] Reuters, http://www.reuters.com/, downloaded on December 17, 2018.

[4] Average excludes negative growth rates.

Exhibit CCW-4

Constant Growth DCF Model
(Consensus Analysts' Growth Rates)

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

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	Alliant Energy Corporation	$43.94	6.00%	$1.34	3.23%	9.23%
2	Ameren Corporation	$66.34	7.03%	$1.90	3.07%	10.09%
3	Black Hills Corporation	$62.06	4.52%	$1.90	3.20%	7.72%
4	CMS Energy Corporation	$50.31	6.72%	$1.43	3.03%	9.76%
5	Consolidated Edison, Inc.	$77.95	3.27%	$2.86	3.79%	7.06%
6	DTE Energy Company	$114.39	5.78%	$3.78	3.50%	9.27%
7	Duke Energy Corporation	$83.99	4.68%	$3.71	4.62%	9.30%
8	Entergy Corporation	$84.37	4.96%	$3.64	4.53%	9.48%
9	Eversource Energy	$64.54	5.89%	$2.02	3.31%	9.20%
10	Exelon Corporation	$44.55	4.94%	$1.38	3.25%	8.19%
11	NorthWestern Corporation	$61.04	2.23%	$2.20	3.68%	5.91%
12	PPL Corporation	$30.52	4.48%	$1.64	5.61%	10.09%
13	Public Service Enterprise Group Incorporated	$53.88	6.86%	$1.80	3.57%	10.43%
14	Sempra Energy	$114.41	8.16%	$3.58	3.38%	11.54%
15	WEC Energy Group, Inc.	$69.65	4.96%	$2.21	3.33%	8.29%
16	Xcel Energy Inc.	$49.67	6.09%	$1.52	3.25%	9.34%
17	**Average**	**$66.98**	**5.41%**	**$2.31**	**3.65%**	**9.06%**
18	**Median**					**9.29%**

Sources:

[1] S&P Global Market Intelligence, Downloaded on December 17, 2018.

[2] Exhibit CCW-3.

[3] *The Value Line Investment Survey*, October 26, November 16, and December 14, 2018.

Exhibit CCW-5

Payout Ratios

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Payout Ratios

Line	Company	Dividends Per Share		Earnings Per Share		Payout Ratio	
		2017 (1)	Projected (2)	2017 (3)	Projected (4)	2017 (5)	Projected (6)
1	Alliant Energy Corporation	$1.26	$1.66	$1.99	$2.60	63.32%	63.85%
2	Ameren Corporation	$1.78	$2.35	$2.77	$4.00	64.26%	58.75%
3	Black Hills Corporation	$1.81	$2.45	$3.38	$4.25	53.55%	57.65%
4	CMS Energy Corporation	$1.33	$1.85	$2.17	$3.00	61.29%	61.67%
5	Consolidated Edison, Inc.	$2.76	$3.30	$4.10	$4.75	67.32%	69.47%
6	DTE Energy Company	$3.36	$4.55	$5.73	$7.75	58.64%	58.71%
7	Duke Energy Corporation	$3.49	$4.30	$4.22	$5.50	82.70%	78.18%
8	Entergy Corporation	$3.50	$3.90	$5.19	$6.25	67.44%	62.40%
9	Eversource Energy	$1.90	$2.50	$3.11	$4.00	61.09%	62.50%
10	Exelon Corporation	$1.31	$1.70	$2.78	$3.75	47.12%	45.33%
11	NorthWestern Corporation	$2.10	$2.60	$3.34	$4.00	62.87%	65.00%
12	PPL Corporation	$1.58	$1.80	$2.11	$2.75	74.88%	65.45%
13	Public Service Enterprise Group Incorporated	$1.72	$2.20	$2.82	$3.75	60.99%	58.67%
14	Sempra Energy	$3.29	$4.90	$4.63	$7.75	71.06%	63.23%
15	WEC Energy Group, Inc.	$2.08	$2.75	$3.14	$4.25	66.24%	64.71%
16	Xcel Energy Inc.	$1.44	$1.90	$2.30	$3.00	62.61%	63.33%
17	**Average**	**$2.17**	**$2.79**	**$3.36**	**$4.46**	**64.09%**	**62.43%**

Source:
The Value Line Investment Survey, October 26, November 16, and December 14, 2018.

Exhibit CCW-6

Sustainable Growth Rate

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Sustainable Growth Rate

					3 to 5 Year Projections							Sustainable
		Dividends	Earnings	Book Value	Book Value		Adjustment	Adjusted	Payout	Retention	Internal	Growth
Line	Company	Per Share	Per Share	Per Share	Growth	ROE	Factor	ROE	Ratio	Rate	Growth Rate	Rate
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Alliant Energy Corporation	$1.66	$2.60	$24.30	6.09%	10.70%	1.03	11.02%	63.85%	36.15%	3.98%	5.63%
2	Ameren Corporation	$2.35	$4.00	$37.75	4.98%	10.60%	1.02	10.85%	58.75%	41.25%	4.48%	5.22%
3	Black Hills Corporation	$2.45	$4.25	$42.50	5.89%	10.00%	1.03	10.29%	57.65%	42.35%	4.36%	6.50%
4	CMS Energy Corporation	$1.85	$3.00	$22.50	7.37%	13.33%	1.04	13.81%	61.67%	38.33%	5.29%	7.18%
5	Consolidated Edison, Inc.	$3.30	$4.75	$57.75	3.03%	8.23%	1.01	8.35%	69.47%	30.53%	2.55%	2.95%
6	DTE Energy Company	$4.55	$7.75	$70.00	5.71%	11.07%	1.03	11.38%	58.71%	41.29%	4.70%	6.65%
7	Duke Energy Corporation	$4.30	$5.50	$65.75	1.97%	8.37%	1.01	8.45%	78.18%	21.82%	1.84%	2.36%
8	Entergy Corporation	$3.90	$6.25	$56.75	5.09%	11.01%	1.02	11.29%	62.40%	37.60%	4.24%	6.12%
9	Eversource Energy	$2.50	$4.00	$42.00	3.72%	9.52%	1.02	9.70%	62.50%	37.50%	3.64%	3.64%
10	Exelon Corporation	$1.70	$3.75	$40.00	5.24%	9.38%	1.03	9.61%	45.33%	54.67%	5.26%	5.41%
11	NorthWestern Corporation	$2.60	$4.00	$43.00	3.37%	9.30%	1.02	9.46%	65.00%	35.00%	3.31%	3.75%
12	PPL Corporation	$1.80	$2.75	$20.75	5.98%	13.25%	1.03	13.64%	65.45%	34.55%	4.71%	7.01%
13	Public Service Enterprise Group Incorporated	$2.20	$3.75	$34.50	4.70%	10.87%	1.02	11.12%	58.67%	41.33%	4.60%	4.60%
14	Sempra Energy	$4.90	$7.75	$66.50	5.70%	11.65%	1.03	11.98%	63.23%	36.77%	4.40%	9.58%
15	WEC Energy Group, Inc.	$2.75	$4.25	$35.50	3.44%	11.97%	1.02	12.17%	64.71%	35.29%	4.30%	4.30%
16	Xcel Energy Inc.	$1.90	$3.00	$28.00	4.42%	10.71%	1.02	10.95%	63.33%	36.67%	4.01%	5.05%
17	**Average**	**$2.79**	**$4.46**	**$42.97**	**4.79%**	**10.62%**	**1.02**	**10.88%**	**62.43%**	**37.57%**	**4.10%**	**5.37%**

Sources and Notes:

Cols. (1), (2) and (3): *The Value Line Investment Survey*, October 26, November 16, and December 14, 2018.

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).

Louisville Gas and Electric Company
Kentucky Utilities Company

Sustainable Growth Rate

Line	Company	13-Week Average Stock Price[1] (1)	2017 Book Value Per Share[2] (2)	Market to Book Ratio (3)	Common Shares Outstanding (in Millions)[2] 2017 (4)	3-5 Years (5)	Growth (6)	S Factor[3] (7)	V Factor[4] (8)	S * V (9)
1	Alliant Energy Corporation	$43.94	$18.08	2.43	231.35	245.00	1.15%	2.80%	58.86%	1.65%
2	Ameren Corporation	$66.34	$29.61	2.24	242.63	250.00	0.60%	1.34%	55.36%	0.74%
3	Black Hills Corporation	$62.06	$31.92	1.94	53.54	59.90	2.27%	4.41%	48.57%	2.14%
4	CMS Energy Corporation	$50.31	$15.77	3.19	281.65	294.00	0.86%	2.75%	68.65%	1.89%
5	Consolidated Edison, Inc.	$77.95	$49.74	1.57	310.00	321.00	0.70%	1.10%	36.19%	0.40%
6	DTE Energy Company	$114.39	$53.03	2.16	179.39	195.00	1.68%	3.63%	53.64%	1.95%
7	Duke Energy Corporation	$83.99	$59.63	1.41	700.00	745.00	1.25%	1.77%	29.01%	0.51%
8	Entergy Corporation	$84.37	$44.28	1.91	180.52	200.00	2.07%	3.95%	47.52%	1.87%
9	Eversource Energy	$64.54	$34.99	1.84	316.89	316.89	0.00%	0.00%	45.78%	0.00%
10	Exelon Corporation	$44.55	$30.99	1.44	963.34	980.00	0.34%	0.49%	30.43%	0.15%
11	NorthWestern Corporation	$61.04	$36.44	1.68	49.37	51.00	0.65%	1.09%	40.30%	0.44%
12	PPL Corporation	$30.52	$15.52	1.97	693.40	780.00	2.38%	4.68%	49.15%	2.30%
13	Public Service Enterprise Group Incorporated	$53.88	$27.42	1.96	505.00	505.00	0.00%	0.00%	49.11%	0.00%
14	Sempra Energy	$114.41	$50.41	2.27	251.36	307.00	4.08%	9.26%	55.94%	5.18%
15	WEC Energy Group, Inc.	$69.65	$29.98	2.32	315.57	315.50	- 0.00%	- 0.01%	56.96%	- 0.01%
16	Xcel Energy Inc.	$49.67	$22.56	2.20	507.76	530.00	0.86%	1.90%	54.58%	1.03%
17	**Average**	**$66.98**	**$34.40**	**2.03**	**361.36**	**380.96**	**1.26%**	**2.61%**	**48.75%**	**1.35%**

Sources and Notes:

[1] S&P Global Market Intelligence, Downloaded on December 17, 2018.

[2] *The Value Line Investment Survey*, October 26, November 16, and December 14, 2018.

[3] Expected Growth in the Number of Shares, Column (3) * Column (6).

[4] Expected Profit of Stock Investment, [1 - 1 / Column (3)].

Exhibit CCW-7

Constant Growth DCF Model
(Sustainable Growth Rate)

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities 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	Alliant Energy Corporation	$43.94	5.63%	$1.34	3.22%	8.85%
2	Ameren Corporation	$66.34	5.22%	$1.90	3.01%	8.24%
3	Black Hills Corporation	$62.06	6.50%	$1.90	3.26%	9.76%
4	CMS Energy Corporation	$50.31	7.18%	$1.43	3.05%	10.23%
5	Consolidated Edison, Inc.	$77.95	2.95%	$2.86	3.78%	6.72%
6	DTE Energy Company	$114.39	6.65%	$3.78	3.52%	10.17%
7	Duke Energy Corporation	$83.99	2.36%	$3.71	4.52%	6.88%
8	Entergy Corporation	$84.37	6.12%	$3.64	4.58%	10.70%
9	Eversource Energy	$64.54	3.64%	$2.02	3.24%	6.88%
10	Exelon Corporation	$44.55	5.41%	$1.38	3.27%	8.67%
11	NorthWestern Corporation	$61.04	3.75%	$2.20	3.74%	7.49%
12	PPL Corporation	$30.52	7.01%	$1.64	5.75%	12.76%
13	Public Service Enterprise Group Incorporated	$53.88	4.60%	$1.80	3.49%	8.09%
14	Sempra Energy	$114.41	9.58%	$3.58	3.43%	13.01%
15	WEC Energy Group, Inc.	$69.65	4.30%	$2.21	3.31%	7.61%
16	Xcel Energy Inc.	$49.67	5.05%	$1.52	3.21%	8.26%
17	**Average**	**$66.98**	**5.37%**	**$2.31**	**3.65%**	**9.02%**
18	**Median**					**8.47%**

Sources:

[1] S&P Global Market Intelligence, Downloaded on December 17, 2018.

[2] Exhibit CCW-6, page 1.

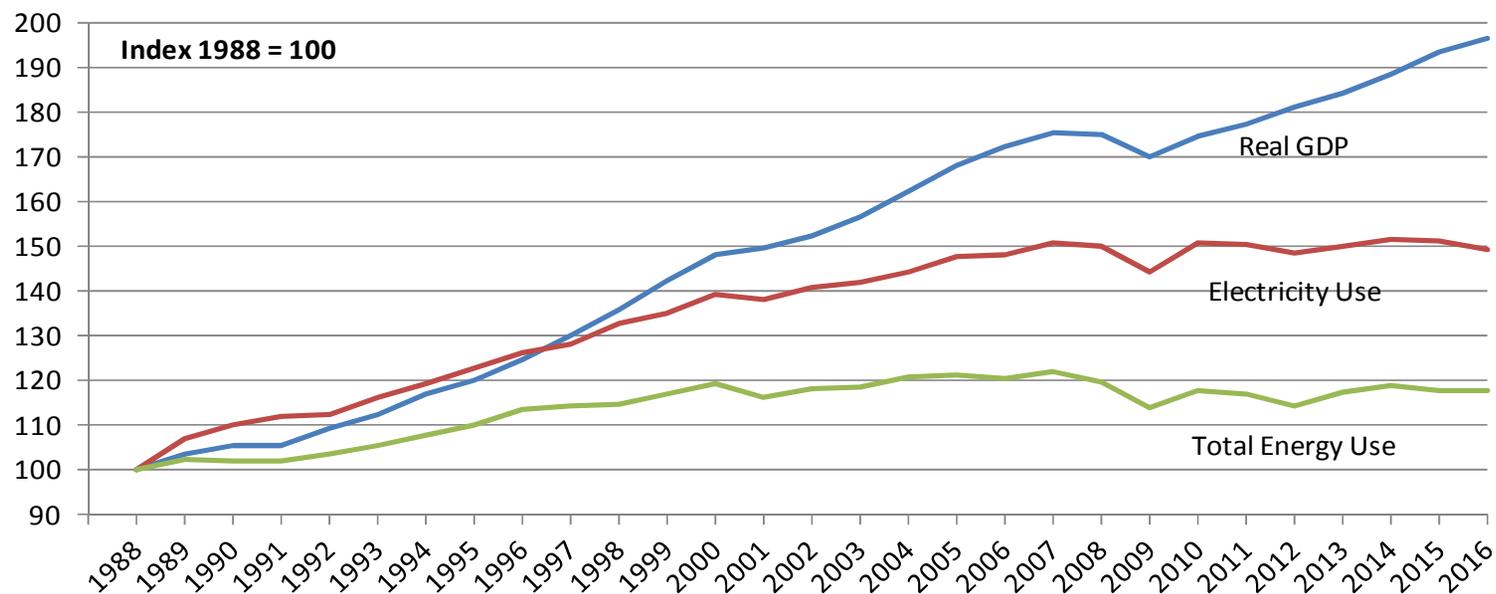[3] *The Value Line Investment Survey*, October 26, November 16, and December 14, 2018.

Exhibit CCW-8

Electricity Sales Are Linked
to U.S. Economic Growth

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Electricity Sales Are Linked to U.S. Economic Growth

Index 1988 = 100

Real GDP

Electricity Use

Total Energy Use

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-9

Multi-Stage Growth DCF Model

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities 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	Alliant Energy Corporation	$43.94	$1.34	6.00%	5.70%	5.40%	5.10%	4.80%	4.49%	4.19%	7.76%
2	Ameren Corporation	$66.34	$1.90	7.03%	6.55%	6.08%	5.61%	5.14%	4.67%	4.19%	7.77%
3	Black Hills Corporation	$62.06	$1.90	4.52%	4.47%	4.41%	4.36%	4.30%	4.25%	4.19%	7.44%
4	CMS Energy Corporation	$50.31	$1.43	6.72%	6.30%	5.88%	5.46%	5.04%	4.61%	4.19%	7.67%
5	Consolidated Edison, Inc.	$77.95	$2.86	3.27%	3.42%	3.58%	3.73%	3.89%	4.04%	4.19%	7.79%
6	DTE Energy Company	$114.39	$3.78	5.78%	5.51%	5.25%	4.98%	4.72%	4.46%	4.19%	8.00%
7	Duke Energy Corporation	$83.99	$3.71	4.68%	4.60%	4.52%	4.43%	4.35%	4.27%	4.19%	8.93%
8	Entergy Corporation	$84.37	$3.64	4.96%	4.83%	4.70%	4.57%	4.45%	4.32%	4.19%	8.91%
9	Eversource Energy	$64.54	$2.02	5.89%	5.60%	5.32%	5.04%	4.76%	4.48%	4.19%	7.82%
10	Exelon Corporation	$44.55	$1.38	4.94%	4.82%	4.69%	4.57%	4.44%	4.32%	4.19%	7.58%
11	NorthWestern Corporation	$61.04	$2.20	2.23%	2.56%	2.88%	3.21%	3.54%	3.87%	4.19%	7.49%
12	PPL Corporation	$30.52	$1.64	4.48%	4.43%	4.38%	4.34%	4.29%	4.24%	4.19%	9.89%
13	Public Service Enterprise Group Incorporate	$53.88	$1.80	6.86%	6.42%	5.97%	5.53%	5.08%	4.64%	4.19%	8.31%
14	Sempra Energy	$114.41	$3.58	8.16%	7.50%	6.84%	6.18%	5.52%	4.85%	4.19%	8.37%
15	WEC Energy Group, Inc.	$69.65	$2.21	4.96%	4.83%	4.71%	4.58%	4.45%	4.32%	4.19%	7.66%
16	Xcel Energy Inc.	$49.67	$1.52	6.09%	5.78%	5.46%	5.14%	4.83%	4.51%	4.19%	7.79%
17	**Average**	**$66.98**	**$2.31**	**5.41%**	**5.21%**	**5.00%**	**4.80%**	**4.60%**	**4.40%**	**4.19%**	**8.07%**
18	**Median**										**7.79%**

Sources:

[1] S&P Global Market Intelligence, Downloaded on December 17, 2018.

[2] *The Value Line Investment Survey*, October 26, November 16, and December 14, 2018.

[3] Exhibit CCW-3.

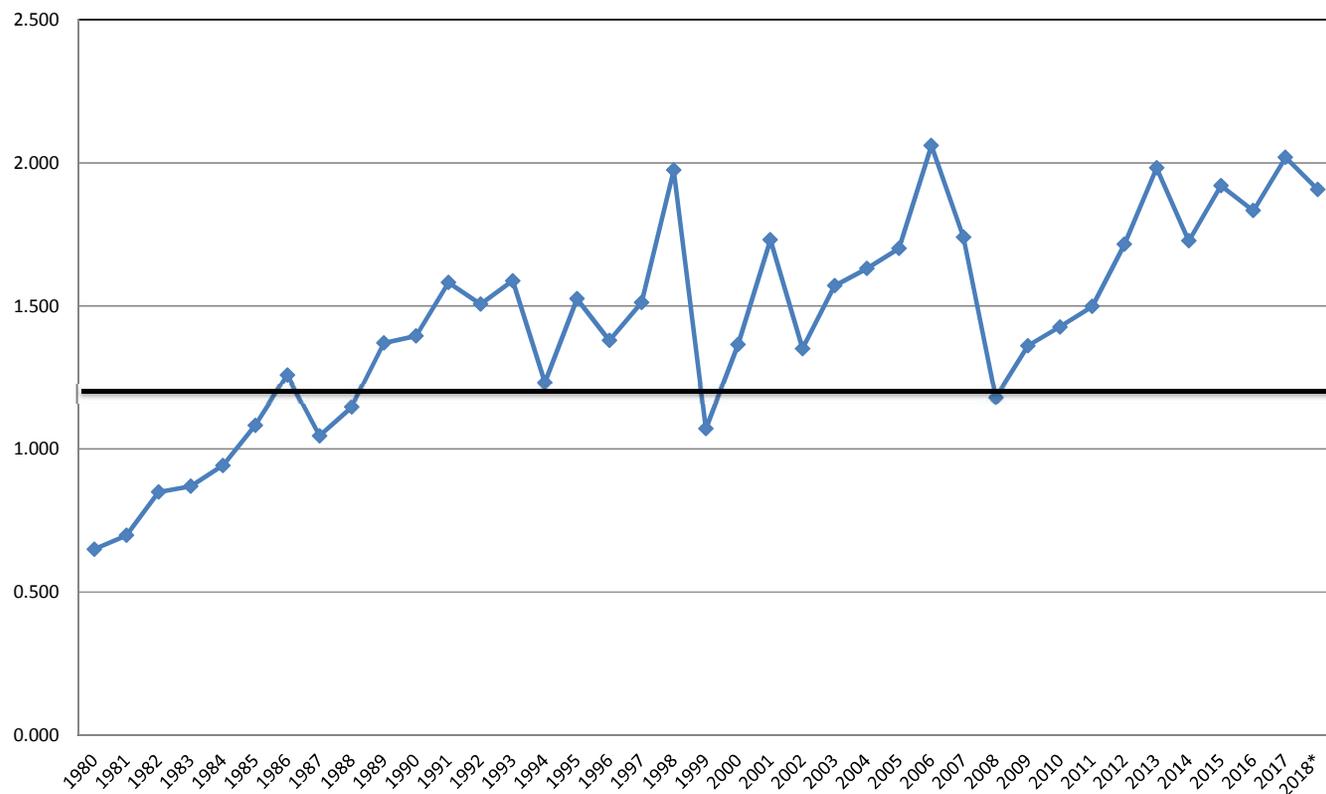[4] *Blue Chip Financial Forecasts*, December 1, 2018 at 14.

Exhibit CCW-10

Common Stock Market/Book Ratio

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Common Stock Market/Book Ratio

Exhibit CCW-11

Equity Risk Premium - Treasury Bond

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities 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%	4.90%	5.44%	5.76%	5.56%
22	2007	10.31%	4.83%	5.48%	5.71%	5.63%
23	2008	10.37%	4.28%	6.09%	5.72%	5.63%
24	2009	10.52%	4.07%	6.45%	5.87%	5.79%
25	2010	10.29%	4.25%	6.04%	5.90%	5.84%
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%	6.08%
29	2014	9.75%	3.34%	6.41%	6.44%	6.15%
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 [3]	9.59%	3.06%	6.53%	6.70%	6.57%
34	**Average**	**11.08%**	**5.54%**	**5.54%**	**5.50%**	**5.50%**
35	**Minimum**				**4.25%**	**4.38%**
36	**Maximum**				**6.72%**	**6.57%**

Sources:

[1] *Regulatory Research Associates, Inc*., Regulatory Focus, Major Rate Case Decisions, Jan. 1997 pg. 5, and Jan. 2011 pg. 3.
S&P Global Market Intelligence, RRA Regulatory Focus, Major Rate Case Decisions, January-
September 2018, October 11, 2018, p. 8.
2006 - 2017 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 includes January - September, 2018.

Exhibit CCW-12

Equity Risk Premium - Utility Bond

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities 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 [3]	9.59%	4.18%	5.41%	5.54%	5.34%
34	**Average**	**11.08%**	**6.90%**	**4.18%**	**4.14%**	**4.10%**
35	**Minimum**				**2.88%**	**3.20%**
36	**Maximum**				**5.57%**	**5.34%**

Sources:

[1] *Regulatory Research Associates, Inc*., Regulatory Focus, Major Rate Case Decisions, Jan. 1997 pg. 5, and Jan. 2011 pg. 3.
S&P Global Market Intelligence, RRA Regulatory Focus, Major Rate Case Decisions, January-
September 2018, October 11, 2018, p. 8.
2006 - 2017 Authorized Returns exclude limited issue rider cases.

[2] 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 from 2010-2017 were obtained from http://credittrends.moodys.com/.

[3] Data includes January - September, 2018.

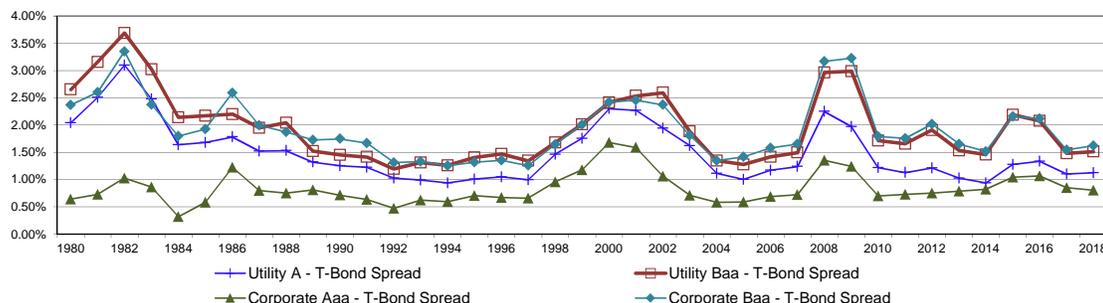# Exhibit CCW-13

Bond Yield Spreads

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Bond Yield Spreads

Line	Year	T-Bond Yield[1] (1)	Public Utility Bond A[2] (2)	Baa[2] (3)	A-T-Bond Spread (4)	Baa-T-Bond Spread (5)	Corporate Bond Aaa[3] (6)	Baa[3] (7)	Aaa-T-Bond Spread (8)	Baa-T-Bond Spread (9)	Utility to Corporate Baa Spread (10)	A-Aaa Spread (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	4.90%	6.07%	6.32%	1.17%	1.42%	5.59%	6.48%	0.69%	1.58%	-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 [4]	3.06%	4.18%	4.57%	1.12%	1.51%	3.87%	4.68%	0.80%	1.62%	-0.11%	0.32%
40	**Average**	**6.53%**	**8.03%**	**8.46%**	**1.50%**	**1.94%**	**7.36%**	**8.45%**	**0.84%**	**1.93%**	**0.01%**	**0.66%**

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 2010-2017 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 2010-2017 were obtained from http://credittrends.moodys.com/.

[4] Data includes January - September, 2018.

Exhibit CCW-14

Treasury and Utility Bond Yields

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities 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	12/14/18	3.14%	4.41%	4.94%
2	12/07/18	3.14%	4.41%	4.95%
3	11/30/18	3.30%	4.53%	5.07%
4	11/23/18	3.31%	4.49%	5.02%
5	11/16/18	3.33%	4.49%	5.00%
6	11/09/18	3.40%	4.53%	5.00%
7	11/02/18	3.46%	4.58%	5.06%
8	10/26/18	3.32%	4.44%	4.91%
9	10/19/18	3.38%	4.48%	4.95%
10	10/12/18	3.32%	4.42%	4.88%
11	10/05/18	3.40%	4.52%	4.94%
12	09/28/18	3.19%	4.33%	4.75%
13	09/21/18	3.20%	4.36%	4.77%
14	**Average**	**3.30%**	**4.46%**	**4.94%**
15	**Spread To Treasury**		**1.16%**	**1.64%**

Sources:

[1] St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org.

[2] http://credittrends.moodys.com/.

Louisville Gas and Electric Company
Kentucky Utilities Company

Trends in Bond Yields
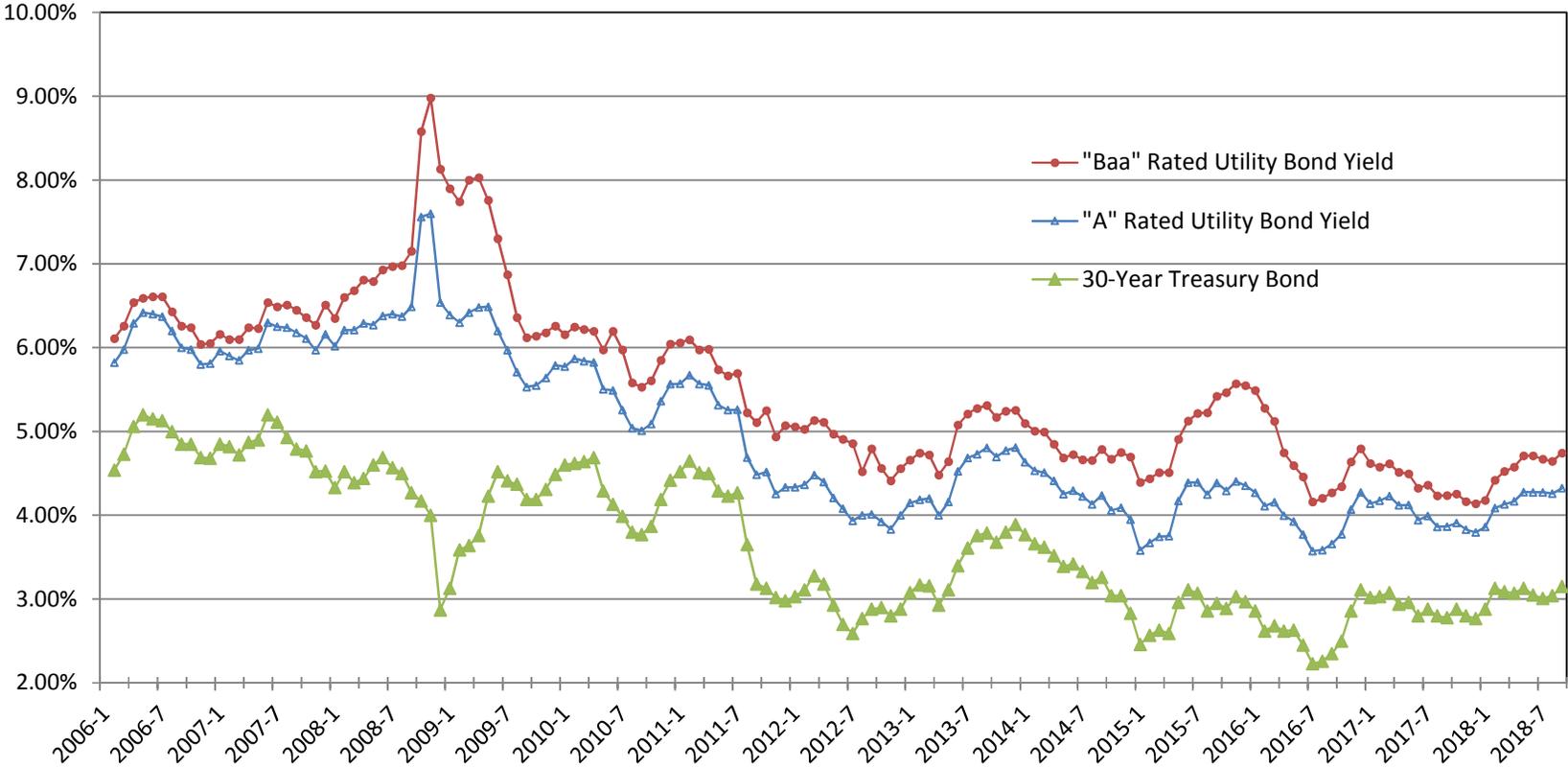
Sources:
Mergent Bond Record.
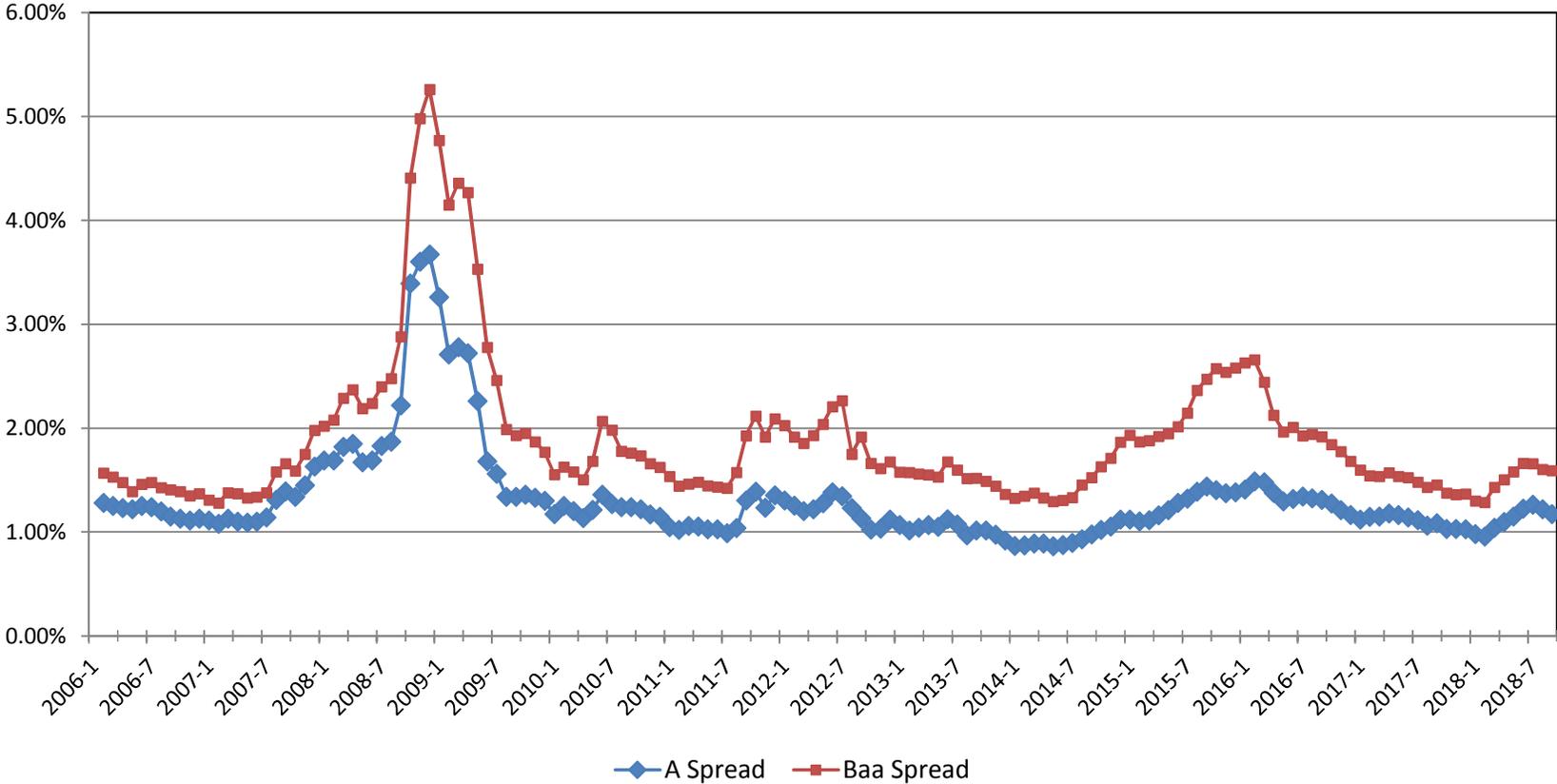www.moodys.com, Bond Yields and Key Indicators.
St. Louis Federal Reserve: Economic Research, http://research.stlouisfed.org/

Louisville Gas and Electric Company
Kentucky Utilities 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-15

Value Line Beta

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

Value Line Beta

Line	Company	Beta
1	Alliant Energy Corporation	0.60
2	Ameren Corporation	0.55
3	Black Hills Corporation	0.80
4	CMS Energy Corporation	0.55
5	Consolidated Edison, Inc.	0.40
6	DTE Energy Company	0.55
7	Duke Energy Corporation	0.50
8	Entergy Corporation	0.60
9	Eversource Energy	0.60
10	Exelon Corporation	0.65
11	NorthWestern Corporation	0.60
12	PPL Corporation	0.70
13	Public Service Enterprise Group Incorporated	0.60
14	Sempra Energy	0.75
15	WEC Energy Group, Inc.	0.50
16	Xcel Energy Inc.	0.55
17	**Average**	**0.59**

Source:
The Value Line Investment Survey,
October 26, November 16, and December 14, 2018.

Exhibit CCW-16

CAPM Return

Witness: Christopher C. Walters

Louisville Gas and Electric Company
Kentucky Utilities Company

CAPM Return

Line	Description	High Market Risk Premium (1)	Low Market Risk Premium (2)
1	Risk-Free Rate[1]	3.70%	3.70%
2	Risk Premium[2]	7.80%	6.10%
3	Beta[3]	0.59	0.59
4	**CAPM**	**8.33%**	**7.32%**

Sources:

[1] *Blue Chip Financial Forecasts*, December 1, 2018, at 2.

[2] *Duff & Phelps, 2018 SBBI Yearbook* at 6-17 and 6-18, and *Duff & Phelps, 2018 Valuation Handbook* at 3-33 and 3-45.

[3] Exhibit CCW-15.