

# Davison Van Cleve PC

Attorneys at Law

TEL (503) 241-7242 • FAX (503) 241-8160 • jog@dvclaw.com  
1750 S Harbor Way, Suite 450  
Portland, OR 97201

June 13, 2023

## *Via Electronic Filing*

Public Utility Commission of Oregon  
Attn: Filing Center  
201 High St. SE, Suite 100  
Salem OR 97301

Re: In the Matter of PORTLAND GENERAL ELECTRIC CO.  
Request for a General Rate Revision.  
**Docket No. UE 416**

Dear Filing Center:

Please find enclosed the Opening General Rate Case (“GRC”) Testimony and Exhibits of Christopher C. Walters on behalf of the Alliance of Western Energy Consumers and Oregon Citizens’ Utility Board (AWEC-CUB/100-116) in the above-referenced docket.

Thank you for your assistance. If you have any questions, please do not hesitate to call.

Sincerely,

/s/ Jesse O. Gorsuch  
Jesse O. Gorsuch

Enclosure

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**UE 416**

In the Matter of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**OPENING TESTIMONY OF CHRISTOPHER C. WALTERS  
ON BEHALF OF  
ALLIANCE OF WESTERN ENERGY CONSUMERS/OR CITIZENS' UTILITY BOARD**

**June 13, 2023**

**TABLE OF CONTENTS TO THE  
OPENING TESTIMONY OF CHRISTOPHER C. WALTERS**

	<u>Page</u>
I. SUMMARY .....	1
II. ACCESS TO CAPITAL AND ECONOMIC ENVIRONMENT .....	2
<i>A. Regulated Utility Industry Authorized ROEs, Access to Capital, and Credit Strength .....</i>	<i>2</i>
<i>B. Federal Reserve Monetary Policy .....</i>	<i>9</i>
<i>C. Market Sentiments and Utility Industry Outlook .....</i>	<i>16</i>
<i>D. Additional Remarks.....</i>	<i>19</i>
III. RETURN ON EQUITY .....	21
<i>A. PGE’s Investment Risk.....</i>	<i>23</i>
<i>B. PGE’s Proposed Capital Structure.....</i>	<i>24</i>
<i>C. Development of Proxy Group .....</i>	<i>25</i>
<i>D. DCF Model .....</i>	<i>27</i>
<i>E. Sustainable Growth DCF.....</i>	<i>30</i>
<i>F. Multi-Stage Growth DCF Model .....</i>	<i>32</i>
<i>G. Risk Premium Model.....</i>	<i>38</i>
<i>H. Capital Asset Pricing Model (“CAPM”).....</i>	<i>43</i>
<i>I. Return on Equity Summary .....</i>	<i>51</i>
IV. RESPONSE TO DR. BENTE VILLADSEN.....	52
<i>A. Summary of Rebuttal.....</i>	<i>52</i>
<i>B. ATWACC.....</i>	<i>56</i>
<i>c. Dr. Villadsen’s DCF Analysis .....</i>	<i>59</i>
<i>D. Dr. Villadsen’s CAPM Analysis.....</i>	<i>60</i>
<i>E. Dr. Villadsen’s Risk Premium Analysis .....</i>	<i>64</i>
<i>f. Response to Dr. Villadsen’s Conclusion that PGE is of Higher Risk.....</i>	<i>66</i>

**EXHIBIT LIST**

**EXHIBIT AWEC-CUB/101 – QUALIFICATIONS OF CHRISTOPHER C. WALTERS**

**EXHIBIT AWEC-CUB/102 – VALUATION METRICS**

**EXHIBIT AWEC-CUB/103 – PROXY GROUP**

**EXHIBIT AWEC-CUB/104 – ANALYST GROWTH RATES**

**EXHIBIT AWEC-CUB/105 – CONSTANT GROWTH DCF**

**EXHIBIT AWEC-CUB/106 – PAYOUT RATIOS**

**EXHIBIT AWEC-CUB/107 – SUSTAINABLE GROWTH RATES**

**EXHIBIT AWEC-CUB/108 – SUSTAINABLE GROWTH DCF**

**EXHIBIT AWEC-CUB/109 – MULTI-STAGE DCF**

**EXHIBIT AWEC-CUB/110 – M/B RATIO**

**EXHIBIT AWEC-CUB/111 – RISK PREMIUM- TREASURY BONDS**

**EXHIBIT AWEC-CUB/112 – RISK PREMIUM- UTILITY BONDS**

**EXHIBIT AWEC-CUB/113 – YIELD SPREADS**

**EXHIBIT AWEC-CUB/114 – CURRENT BOND YIELDS**

**EXHIBIT AWEC-CUB/115 – BETA**

**EXHIBIT AWEC-CUB/116 – CAPM**

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

2 **A.** Christopher C. Walters. My business address is 16690 Swingley Ridge Road, Suite 140,  
3 Chesterfield, MO 63017. I am employed by the firm of Brubaker & Associates, Inc.  
4 (“BAI”), regulatory and economic consultants with corporate headquarters in  
5 Chesterfield, Missouri. My qualifications are provided in Exhibit AWEC/CUB/201.

6 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

7 **A.** I am testifying on behalf of the Alliance of Western Energy Consumers (“AWEC”) and  
8 the Oregon Citizens’ Utility Board (“CUB” and, collectively “AWEC/CUB”). AWEC is  
9 a non-profit trade association whose members are large industrial customers served by  
10 electric utilities throughout the Pacific Northwest, including Portland General Electric  
11 Company (“PGE” or the “Company”). CUB is a statewide non-profit organization that  
12 represents residential ratepayers, who also take electric delivery service from PGE.

13 **Q. WHAT IS THE SUBJECT MATTER OF YOUR TESTIMONY?**

14 **A.** The purpose of my testimony is to provide an overall fair rate of return or cost of capital  
15 recommendation for PGE’s electric utility operations.

16 My silence with regard to any position taken by PGE in its Direct Testimony and  
17 filings in this proceeding does not indicate my endorsement of that position.

18 **Q. ARE YOU SPONSORING ANY EXHIBITS IN CONNECTION WITH YOUR**  
19 **TESTIMONY?**

20 **A.** Yes. I am sponsoring Exhibits AWEC-CUB/101 through AWEC-CUB/116.

21 **I. SUMMARY**

22 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS AND CONCLUSIONS**  
23 **ON RATE OF RETURN.**

24 **A.** In Section II of my testimony, I review and analyze the regulated utility industry’s access

1 to capital, credit rating trends and outlooks, as well as the overall trend in the authorized  
2 Return on Equity ("ROE") for utilities throughout the country. I conclude that the trend  
3 in authorized ROEs for utilities has declined over the last several years and has remained  
4 below 10.0% more recently. I also review the impact that the Federal Reserve's (the  
5 "Fed") monetary policy actions have had on the cost of capital.

6 In Section III of my testimony, I outline how a fair ROE should be established,  
7 provide an overview of the market's perception of the Company's investment risk,  
8 comment on the Company's proposed capital structure, and present the analyses I relied  
9 on to estimate an appropriate ROE for PGE. Based on the results of several cost of  
10 equity estimation methods performed on publicly traded utility companies, I estimate the  
11 current fair market ROE for the proxy group to fall within the range of 9.20% to 9.90%,  
12 with a midpoint of 9.55%. Given the differences in equity ratios and credit ratings  
13 between PGE and the proxy group, an ROE in the lower half of my range would be  
14 warranted. As such, I recommend that PGE's existing ROE of 9.50% be authorized.

15 In Section IV of my testimony, I respond to the Company's witness Dr.  
16 Villadsen's estimate of the current market cost of equity for PGE. Dr. Villadsen  
17 recommends the Company be authorized an ROE of 9.80% at the Company's proposed  
18 common equity ratio of 50.0%. I demonstrate that her recommendations are excessive  
19 and should be rejected.

## 20 **II. ACCESS TO CAPITAL AND ECONOMIC ENVIRONMENT**

### 21 **A. Regulated Utility Industry Authorized ROEs, Access to Capital, and Credit Strength**

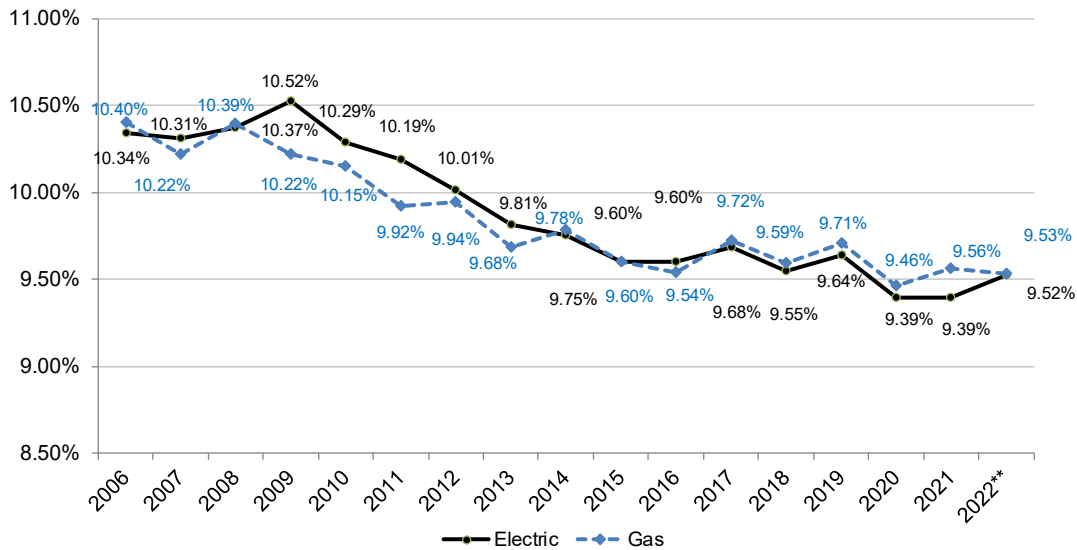
#### 22 **Q. PLEASE DESCRIBE THE OBSERVABLE EVIDENCE ON TRENDS IN** 23 **AUTHORIZED ROEs FOR ELECTRIC AND GAS UTILITIES.**

24 **A.** Authorized ROEs for both electric and gas utilities have declined over the last 10 years,

1 as illustrated in Figure CCW-1, and have been below 10.0% for about the last nine years.

**FIGURE CCW-1**

**Authorized Returns on Equity\*  
(Exclude Limited Issue Riders)**



Source and Notes:

<sup>1</sup> S&P Global Market Intelligence, RRA Regulatory Focus, Major Rate Case Decisions -- January - December 2022, February 23, 2023 at page 3.

<sup>2</sup> S&P Global Market Intelligence, Water utility rate case data, 2010-2022

\* Electric Returns exclude Limited Issue Riders.

\* RRA excludes the 2017 Alaska ENSTAR decision from its calculations.

2 **Q. PLEASE DESCRIBE THE DISTRIBUTION OF AUTHORIZED ROEs FOR**  
3 **ELECTRIC UTILITIES FOR THE LAST FEW YEARS.**

4 **A.** The distribution of authorized returns, annually, since 2016 is summarized in Table  
5 CCW-1.

**TABLE CCW-1**  
**Distribution of Authorized ROEs**  
**(All Electric Utilities)\***

<u>Line</u>	<u>Year</u> <u>(1)</u>	<u>Average</u> <u>(2)</u>	<u>Median</u> <u>(3)</u>	<u>Share of</u> <u>Decisions</u> <u>≤ 9.5%</u>	<u>Share of</u> <u>Decisions</u> <u>≤ 9.7%</u>	<u>Share of</u> <u>Decisions</u> <u>≤ 10.0%</u>
1	2016	9.60%	9.60%	41%	53%	94%
2	2017 <sup>1</sup>	9.67%	9.60%	42%	67%	81%
3	2018 <sup>2</sup>	9.54%	9.57%	47%	63%	100%
4	2019	9.64%	9.65%	39%	58%	88%
5	2020 <sup>3</sup>	9.38%	9.48%	64%	79%	100%
6	2021	9.39%	9.49%	58%	81%	97%
7	2022	9.64%	9.53%	50%	57%	82%
8	2023	9.76%	9.75%	14%	43%	100%
9	Average	9.58%	9.58%	45%	63%	93%
10	Median	9.62%	9.58%	45%	60%	95%

Source and Notes:  
S&P Global Market Intelligence, data through April 28, 2023.  
<sup>1</sup>Includes authorized base ROE of 9.4% for Nevada Power Company, which excludes incentives associated with the Lenzie facility.  
<sup>2</sup>Includes authorized base ROE of 9.6% for Interstate Power & Light Co., which excludes allowed ROE for generating facilities subject to special ratemaking principles.  
<sup>3</sup>Includes authorized base ROE of 9.8% for Interstate Power & Light Co., which excludes allowed ROE for generating facilities subject to special ratemaking principles.  
\*Excludes Limited Issue Rider Cases.

1                   The distribution shows that since 2016, most authorized ROEs have been below  
2                   9.7%, with many of those being below 9.5%.

3 **Q.   HOW HAS THE AUTHORIZED COMMON EQUITY RATIO FLUCTUATED**  
4 **OVER THE SAME TIME PERIOD FOR UTILITIES?**

5 **A.**In general, the utility industry’s common equity ratio has not really deviated too much  
6                   from the range of 50.0% to 52.0%. As shown in Table CCW-2 below, I have provided  
7                   the authorized common equity ratios for utilities around the country, excluding the



1 reported common equity ratios for Arkansas, Florida, Indiana and Michigan. For my  
 2 overall market analysis, I have excluded the reported authorized common equity ratios  
 3 for these states because these jurisdictions include sources of capital outside of  
 4 investor-supplied capital such as accumulated deferred income taxes. As such, the  
 5 reported common equity ratios in these states would result in a downward bias in the  
 6 reported permanent common equity ratios authorized for ratemaking purposes within my  
 7 trend analysis.

**TABLE CCW-2**

**Trends in State Authorized Common Equity Ratios**  
**(Industry)**

<u>Line</u>	<u>Year</u> (1)	<u>Electric</u> <sup>1</sup>	
		<u>Average</u> (2)	<u>Median</u> (3)
1	2016	49.70%	49.99%
2	2017	50.02%	49.85%
3	2018	50.60%	50.23%
4	2019	51.55%	51.37%
5	2020	50.94%	51.17%
6	2021	51.01%	52.00%
7	2022	51.66%	51.92%
8	2023	51.50%	52.29%
9	Average	50.87%	51.10%
10	Median	50.98%	51.27%

Source and Notes:

<sup>1</sup> S&P Global Market Intelligence; data through April 28, 2023.

<sup>2</sup> Excludes Arkansas, Florida, Indiana, and Michigan, because they include non-investor capital.

1 **Q. HAVE REGULATED UTILITY COMPANIES BEEN ABLE TO MAINTAIN**  
2 **RELATIVELY STRONG CREDIT RATINGS DURING PERIODS OF**  
3 **DECLINING AUTHORIZED ROES?**

4 **A.** Yes. As shown below in Table CCW-3, the credit ratings of the industry have improved  
5 since 2009. In 2009, approximately 53% of the industry was rated BBB+ or higher.  
6 Currently, 83% of the industry has a rating of BBB+ or higher.

<u>Description</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
<b>A or higher</b>	12%	12%	12%	11%	13%	13%	13%	10%	10%	8%	14%	14%	10%	10%
<b>A-</b>	18%	20%	19%	22%	26%	26%	34%	43%	52%	54%	54%	53%	37%	37%
<b>BBB+</b>	23%	24%	28%	28%	25%	28%	24%	32%	21%	22%	18%	19%	35%	36%
<b>BBB</b>	36%	26%	24%	22%	26%	23%	18%	4%	7%	13%	12%	3%	16%	16%
<b>BBB-</b>	9%	16%	15%	17%	11%	11%	11%	11%	11%	2%	1%	1%	0%	0%
<b>Below BBB-</b>	<u>2%</u>	<u>2%</u>	<u>2%</u>	<u>0%</u>	<u>0%</u>	<u>0%</u>	<u>0%</u>	<u>0%</u>	<u>0%</u>	<u>0%</u>	<u>0%</u>	<u>10%</u>	<u>1%</u>	<u>1%</u>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: S&P CAPITAL IQ and Market Intelligence, downloaded 12/31/22.  
Note: Subsidiary ratings used.

7 **Q. HAVE UTILITIES BEEN ABLE TO ACCESS EXTERNAL CAPITAL TO**  
8 **SUPPORT CAPITAL EXPENDITURE PROGRAMS?**

9 **A.** Yes. In Regulatory Research Associates’ (“RRA”) March 16, 2023, Utility Capital  
10 Expenditures report, *RRA Financial Focus*, a division of S&P Global Market  
11 Intelligence, made several relevant comments about utility investments generally:

- 12 • 2023 is anticipated to be a record year of utility industry capital  
13 investments, with the aggregated forecast for the 46 tracked energy  
14 utilities exceeding \$171 billion in capex this year, according to the  
15 results of analysis by Regulatory Research Associates.
- 16 • 2023 forecast capital expenditures by the RRA-tracked energy utilities  
17 are expected to be the greatest spending magnitude of any year-to-  
18 date, with the anticipated aggregate capex rising more than 18%  
19 compared with the 2022 realized spending of \$144 billion by these 46  
20 tracked utilities.
- 21 • Capex in the years 2024 and 2025 is forecast to expand incrementally  
22 each year to \$173.4 billion and \$177.1 billion, respectively, on

1 spending growth in electric transmission, distribution and generation  
2 assets, as well as in the renewables sector.

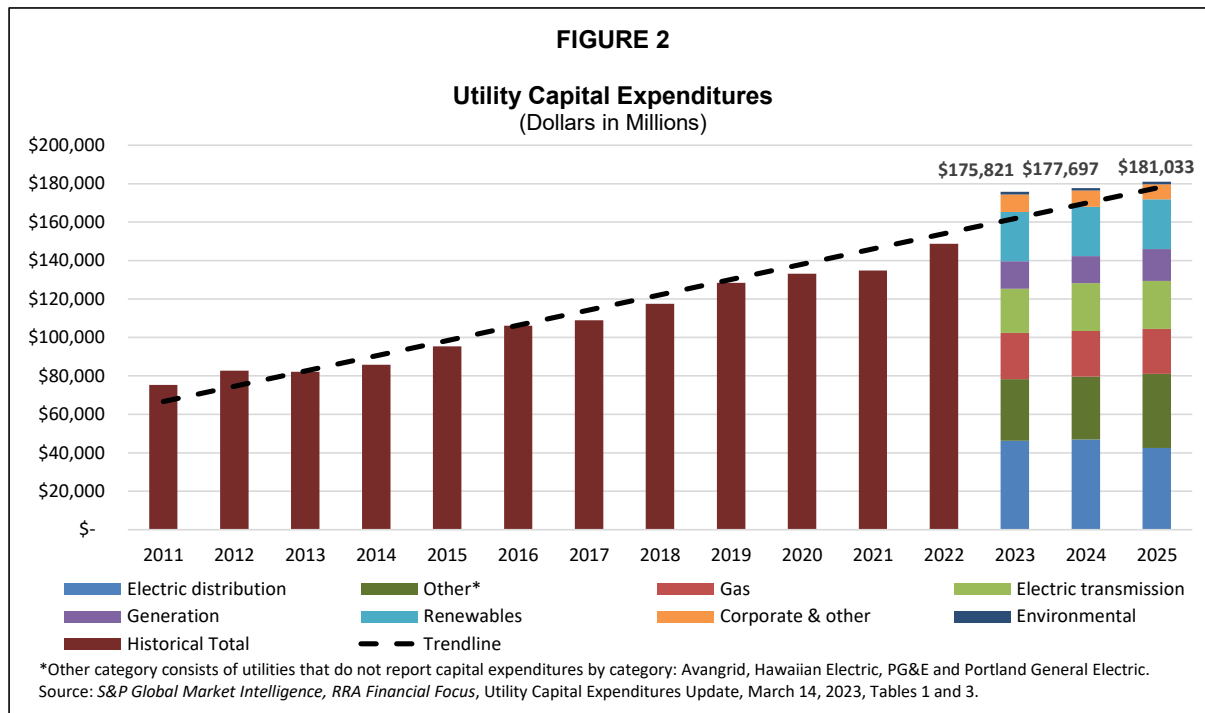
3 • The nation's electric, gas and water utilities are investing in  
4 infrastructure at record levels to upgrade aging transmission and  
5 distribution systems; build new gas, solar and wind generation; and  
6 implement new technologies, including those related to smart meter  
7 deployment, smart grid systems, cybersecurity measures, electric  
8 vehicles and battery storage. The considerable spending levels are  
9 expected to serve as the basis for solid profit expansion in the utility  
10 industry for the foreseeable future.

11 • Several catalysts are anticipated to impel elevated spending over the  
12 next several years, including replacement of aging infrastructure, state  
13 renewable portfolio standards, federal infrastructure investment plans  
14 and tax credits that incentivize conversion of the nation's power  
15 generation network to zero-carbon sources. The federal Inflation  
16 Reduction Act of 2022 is also expected to play a substantial role over  
17 the next decade.<sup>1</sup>

18 As shown in Figure CCW-2 below, capital expenditures for the regulated utilities  
19 have increased considerably over the period 2022 into 2023, and the forecasted capital  
20 expenditures remain elevated through the end of 2025.

---

<sup>1/</sup> *S&P Global Market Intelligence, RRA Financial Focus: “Seismic shift in capex plans reported by utilities for 2023 through 2025,”* March 16, 2023 (emphasis added).



1           As outlined in Figure CCW-2 above, and in the comments made by *RRA S&P*  
2           *Global Market Intelligence*, capital investments for the utility industry continue to stay at  
3           elevated levels, and these capital expenditures are expected to fuel utilities’ profit growth  
4           into the foreseeable future.

5   **Q.   WHAT IS THE SIGNIFICANCE OF THESE FINDINGS?**

6   **A.**   This is clear evidence that the capital investments are enhancing shareholder value and  
7           are attracting both equity and debt capital to the utility industry in a manner that allows  
8           for these elevated capital investments. While capital markets embrace these profit-driven  
9           capital investments, regulatory commissions also must be careful to maintain reasonable  
10          prices and tariff terms and conditions to protect customers’ need for reliable utility  
11          service but at competitive and affordable tariff prices.

12   **Q.   IS THERE EVIDENCE OF ROBUST VALUATIONS OF REGULATED UTILITY**  
13   **EQUITY SECURITIES?**

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

1 which is a strong indication that they can access equity capital under reasonable terms  
2 and conditions, and at relatively low cost. As shown on AWEC-CUB/102, the historical  
3 valuation of utilities followed by *The Value Line Investment Survey* (“*Value Line*”), based  
4 on a price-to-earnings (“P/E”) ratio, price-to-cash flow (“P/CF”) ratio, and market price-  
5 to-book value (“M/B”) ratio, indicates utility security valuations today are very strong  
6 and robust relative to the last several years. These strong valuations of utility stocks  
7 indicate that utilities have access to equity capital under reasonable terms and at lower  
8 costs.

9 **Q. WHAT CONCLUSION DO YOU DRAW FROM THIS OBSERVABLE MARKET**  
10 **DATA IN FORMING YOUR RECOMMENDED ROE AND OVERALL RATE OF**  
11 **RETURN?**

12 **A.** Generally, authorized ROEs, credit standing, and access to capital have been quite robust  
13 for utilities over the last several years, even throughout the duration of the global  
14 pandemic. It is critical that the Commission ensure that utility rates are increased no  
15 more than necessary to provide fair compensation and maintain financial integrity.

16 **B. Federal Reserve Monetary Policy**

17 **Q. ARE THE FEDERAL OPEN MARKET COMMITTEE’S (“FOMC”) ACTIONS**  
18 **KNOWN TO THE MARKET PARTICIPANTS, AND IS IT REASONABLE TO**  
19 **BELIEVE THEY ARE REFLECTED IN THE MARKET’S VALUATION OF**  
20 **BOTH DEBT AND EQUITY SECURITIES?**

21 **A.** Yes. The Fed has been transparent about its efforts to support the economy to achieve  
22 maximum employment, and to manage long-term inflation to around a 2% level. The  
23 Fed has implemented procedures to support the economy’s efforts to achieve these policy  
24 objectives. Specifically, the Fed had previously lowered the Federal Overnight Rate for  
25 securities, and had engaged in a Quantitative Easing program where the Fed was buying,  
26 on a monthly basis, Treasury and mortgage-backed securities in order to moderate the



1 **Q. HAS THE FED MADE RECENT COMMENTS CONCERNING MONETARY**  
2 **POLICY AND THE POTENTIAL IMPACT ON INTEREST RATES?**

3 **A.** Yes. In its recent press release, the FOMC stated the following:

4 The Federal Open Market Committee (FOMC) is firmly committed to  
5 fulfilling its statutory mandate from the Congress of promoting maximum  
6 employment, stable prices, and moderate long-term interest rates. The  
7 Committee seeks to explain its monetary policy decisions to the public as  
8 clearly as possible. Such clarity facilitates well-informed decision-making  
9 by households and businesses, reduces economic and financial  
10 uncertainty, increases the effectiveness of monetary policy, and enhances  
11 transparency and accountability, which are essential in a democratic  
12 society.<sup>2</sup>

13 In a recent statement, FOMC also stated that:

14 Recent indicators point to modest growth in spending and production. Job  
15 gains have been robust in recent months, and the unemployment rate has  
16 remained low. Inflation has eased somewhat but remains elevated.<sup>3</sup>

17 The above quotes suggest to me that the FOMC has recently shown signs  
18 of success in, and remains committed to, stabilizing consumer prices, and  
19 promoting maximum employment through its monetary policy tools.

20 **Q. WHAT DO INDEPENDENT ECONOMISTS' OUTLOOKS FOR FUTURE**  
21 **INTEREST RATES INDICATE?**

22 **A.** Independent economists, surveyed by *Blue Chip Financial Forecasts*, expect current  
23 capital costs to increase at mixed rates over the near term, while maintaining levels that  
24 are still low by historical standards. For example, independent projections show that the  
25 consensus is the federal funds rate will increase at a rate much faster than that of long-  
26 term interest rates as measured by the 30-year Treasury bond. Inflation, as measured

---

<sup>2/</sup> [https://www.federalreserve.gov/monetarypolicy/files/FOMC\\_LongerRunGoals.pdf](https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf), Adopted effective January 24, 2012; as reaffirmed effective January 31, 2023.

<sup>3/</sup> <https://www.federalreserve.gov/newsevents/pressreleases/monetary20230201a.htm>, February 1, 2023.

1 through the Gross Domestic Product (“GDP”) price index, is expected to cool off in the  
2 near to intermediate term.

3 The consensus projections for the next several quarters are provided in Table  
4 CCW-4 below.



TABLE CCW-4

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

Publication Date	3Q 2021	4Q 2021	1Q 2022	2Q 2022	3Q 2022	4Q 2022	1Q 2023	2Q 2023	3Q 2023	4Q 2023	1Q 2024	2Q 2024	3Q 2024
<u>Federal Funds Rate</u>													
Nov-21	0.1	0.1	0.1	0.1	0.1	0.3	0.4						
Dec-21	<b>0.1</b>	0.1	0.1	0.1	0.3	0.4	0.6						
Jan-22		0.1	0.1	0.3	0.5	0.7	0.9	1.1					
Feb-22		0.1	0.2	0.5	0.8	1.0	1.3	1.5					
Mar-22		<b>0.1</b>	0.2	0.6	1.0	1.3	1.6	1.8					
Apr-22			0.1	0.8	1.4	1.8	2.2	2.4	2.6				
May-22			0.1	1.0	1.7	2.2	2.6	2.9	3.0				
Jun-22			<b>0.1</b>	1.0	1.9	2.4	2.8	3.0	3.1				
Jul-22				0.7	2.4	3.1	3.5	3.5	3.5	3.4			
Aug-22				0.8	2.5	3.2	3.5	3.5	3.4	3.3			
Sep-22				<b>0.8</b>	2.5	3.4	3.6	3.6	3.5	3.4			
Oct-22					2.1	3.8	4.3	4.4	4.3	4.2	3.9		
Nov-22					2.2	3.9	4.6	4.7	4.6	4.4	4.1		
Dec-22					<b>2.2</b>	4.0	4.7	4.9	4.8	4.6	4.4		
Jan-23						3.6	4.7	5.0	4.9	4.7	4.4	4.0	
Feb-23						3.7	4.7	5.0	4.9	4.7	4.3	4.0	
Mar-23						<b>3.7</b>	4.7	5.1	5.1	5.0	4.7	4.2	
Apr-23							4.5	5.0	5.1	4.9	4.6	4.2	3.8
<u>T-Bond, 30 yr.</u>													
Nov-21	1.9	2.2	2.3	2.4	2.5	2.6	2.7						
Dec-21	<b>1.9</b>	2.1	2.2	2.3	2.5	2.6	2.7						
Jan-22		2.0	2.1	2.2	2.4	2.5	2.7	2.8					
Feb-22		2.0	2.2	2.3	2.5	2.6	2.7	2.8					
Mar-22		<b>2.0</b>	2.2	2.5	2.6	2.7	2.9	3.0					
Apr-22			2.3	2.6	2.8	3.0	3.2	3.3	3.3				
May-22			2.3	2.9	3.1	3.2	3.4	3.5	3.5				
Jun-22			<b>2.3</b>	3.0	3.3	3.4	3.5	3.6	3.6				
Jul-22				3.0	3.5	3.6	3.7	3.8	3.8	3.8			
Aug-22				3.0	3.2	3.4	3.5	3.5	3.5	3.5			
Sep-22				<b>3.0</b>	3.1	3.4	3.5	3.6	3.6	3.6			
Oct-22					3.2	3.8	3.9	4.0	3.9	3.8	3.8		
Nov-22					3.3	4.0	4.1	4.1	4.0	3.9	3.9		
Dec-22					<b>3.3</b>	4.0	4.2	4.2	4.1	3.9	3.9		
Jan-23						3.9	4.0	4.0	3.9	3.9	3.8	3.8	
Feb-23						3.9	3.8	3.9	3.9	3.8	3.8	3.7	
Mar-23						<b>3.9</b>	3.9	4.0	3.9	3.9	3.8	3.8	
Apr-23							3.8	3.9	3.8	3.8	3.8	3.8	3.7
<u>GDP Price Index</u>													
Nov-21	5.7	3.4	2.7	2.6	2.5	2.4	2.3						
Dec-21	<b>5.9</b>	4.6	3.4	2.8	2.7	2.5	2.5						
Jan-22		4.6	3.7	3.1	2.8	2.6	2.5	2.5					
Feb-22		6.9	4.3	3.4	3.0	2.8	2.6	2.5					
Mar-22		<b>7.1</b>	4.8	3.8	3.1	2.8	2.6	2.5					
Apr-22			4.8	5.1	3.7	3.0	2.8	2.6	2.6				
May-22			8.0	5.6	4.0	3.4	3.0	2.8	2.6				
Jun-22			<b>8.1</b>	5.9	4.6	3.5	3.1	2.8	2.7				
Jul-22				5.9	5.2	3.9	3.4	2.8	2.7	2.6			
Aug-22				8.7	5.3	3.8	3.3	2.7	2.7	2.6			
Sep-22				<b>8.9</b>	4.9	4.1	3.3	2.7	2.7	2.5			
Oct-22					4.9	4.3	3.5	3.0	2.8	2.7	2.5		
Nov-22					4.1	4.6	3.8	3.1	2.7	2.7	2.3		
Dec-22					<b>4.3</b>	4.3	3.8	3.0	2.7	2.6	2.3		
Jan-23						4.3	3.6	3.0	2.7	2.5	2.3	2.2	
Feb-23						3.5	3.3	3.0	2.7	2.6	2.4	2.3	
Mar-23						<b>3.9</b>	3.2	2.8	2.6	2.5	2.5	2.3	
Apr-23							3.2	3.2	2.9	2.7	2.5	2.3	2.2

Source and Note:  
Blue Chip Financial Forecasts, July 2021 through April 2023.  
Actual Yields in Bold.

1                   Further, the outlook for long-term interest rates in the intermediate to longer term  
2                   is also impacted by the current Fed actions and the expectation that eventually the Fed's  
3                   monetary actions will return to more normal levels. Long-term interest rate projections  
4                   are illustrated in Table CCW-5 below.

<b>TABLE CCW-5</b>			
<b><u>30-Year Treasury Bond Yield Actual Vs. Projection</u></b>			
<b><u>Description</u></b>	<b><u>Actual</u></b>	<b><u>2-Year Projected*</u></b>	<b><u>5- to 10-Year Projected</u></b>
<u>2019</u>			
Q1	3.01%	3.50%	
Q2	2.78%	3.17%	3.6% - 3.8%
Q3	2.30%	2.70%	
Q4	2.30%	2.50%	3.2% - 3.7%
<u>2020</u>			
Q1	1.88%	2.57%	
Q2	1.38%	1.90%	3.0% - 3.8%
Q3	1.36%	1.87%	
Q4	1.62%	1.97%	2.8% - 3.6%
<u>2021</u>			
Q1	2.07%	2.23%	
Q2	2.26%	2.77%	3.5% - 3.9%
Q3	1.93%	2.63%	
Q4	1.95%	2.70%	3.4% - 3.8%
<u>2022</u>			
Q1	2.25%	2.87%	
Q2	3.04%	3.47%	3.8% - 3.9%
Q3	3.26%	3.63%	
Q4	3.90%	3.87%	3.9% - 4.0%
<u>2023</u>			
Q1	3.75%	3.77%	
<hr/> Source and Note: <i>Blue Chip Financial Forecasts</i> , January 2016 through April 2023. *Average of all 3 reports in Quarter.			

1                   As outlined in Table CCW-5 above, the outlook for increases in interest rates has  
 2                   jumped more recently relative to 2020 and part of 2021, but is still relatively modest  
 3                   compared to time periods prior to the beginning of the worldwide pandemic. Indeed,

1 relatively low capital market costs are expected to prevail at least in the near-term and out  
2 over the next five to ten years. While there is potential for some upward movement in the  
3 cost of capital, that upward movement is uncertain. In fact, as shown on Figure CCW-3  
4 above, increases in the federal funds rate do not necessarily translate into increases in  
5 longer-term yields.

6 **C. Market Sentiments and Utility Industry Outlook**

7 **Q. PLEASE DESCRIBE THE CREDIT RATING OUTLOOK FOR REGULATED**  
8 **UTILITIES.**

9 **A.** Credit analysts are concerned about rate affordability, driven by increases in commodity  
10 costs within rate base or capital investments, increases in interest rates, and credit  
11 analysts' concerns about utility rate affordability to customers. Each of these current  
12 outlooks for the credit standing of utility companies is discussed related to S&P, Moody's  
13 and Fitch perspectives. Specifically, in a recent report, S&P states the following:

14 The industry outlook remains negative and has been negative since early  
15 2020. Over this timeframe downgrades have outpaced upgrades by more  
16 than 3:1 (see chart 8). While the industry's percentage of negative  
17 outlooks has decreased to about 15% from 35% at year-end 2020,  
18 prolonged inflationary risks or a deeper-than-expected recession could  
19 harm the industry's credit quality in 2023.<sup>4</sup>

20 In S&P's North American regulated utility report, it notes the industry outlook  
21 remains negative. S&P notes that the credit quality of the industry has changed to BBB+  
22 from an A- rating over the last few years. It notes that interest rates have increased for  
23 utilities and that utilities have increased the use of securitization bonds for recovering  
24 storm, hurricane and wildfire costs. S&P notes key assumptions in its forecasted outlook  
25 for utilities include inflation outlooks but expects inflation to decrease to around 4% by

---

<sup>4/</sup> *S&P Global Ratings: "Industry Top Trends: North America Regulated Utilities,"* January 23, 2023, at 4.

1 year-end 2023, continued robust capital spending for utilities, projecting over  
2 \$190 billion expected to be spent in 2023, and increasing asset sales by utilities reflecting  
3 sales in minority interests in utilities, and non-utility assets. S&P believes that the risks  
4 around their outlook include uncertainty about commodity prices, regulatory risks in  
5 responding to capital spending and other rate pressures by utility to allow them to recover  
6 their cost of service, and physical risks to utility infrastructures by weather events and  
7 wildfires.

8 The credit analysts are also expressing concern for customers' ability to afford to  
9 pay their utility bill as a credit rating factor. S&P notes the following related to the credit  
10 risks in 2023 and beyond:

11 Affordability of customer bill

12 Customer bills may become less affordable because of rising commodity  
13 prices, interest rates, inflation, and capital spending. During 2022, Henry  
14 Hub natural gas prices, the U.S. benchmark, peaked at about \$9 per  
15 mmBTU. Although prices have since retreated to about \$4/mmBTU and  
16 the forward curve reflects \$3.50-\$4.50/mmBTU, they remain substantially  
17 higher than preinflation levels, pressuring the customer bill. While we  
18 estimate the industry's average electric bill represents only about 2.5% of  
19 after-tax household income, sharp increases and bill volatility often results  
20 in increasing customer dissatisfaction that can ultimately heighten  
21 regulatory scrutiny and constrain the industry's ability to effectively  
22 manage regulatory risk.<sup>5</sup>

23 More recently, Moody's Investors Service ("Moody's") changed the industry  
24 outlook to "Negative." Specifically, Moody's states:

25 » **We have revised our outlook on the US regulated utilities sector to**  
26 **negative from stable.** We changed the outlook because of  
27 increasingly challenging business and financial conditions stemming  
28 from higher natural gas prices, inflation and rising interest rates.  
29 These developments raise residential customer affordability issues,  
30 increasing the level of uncertainty with regard to the timely recovery

---

<sup>5/</sup> *S&P Global Ratings*: "Industry Top Trends: North America Regulated Utilities,"  
January 23, 2023, at 4 (emphasis added).

1 of costs for fuel and purchased power, as well as for rate cases more  
2 broadly.

3 \* \* \*

4 » **What could change our outlook:** The outlook could return to stable  
5 if the sector's regulatory support remains intact, natural gas prices  
6 settle at a level where most utilities are able to fully recover fuel and  
7 purchased power costs without a delay beyond 12 months, overall  
8 inflation moderates, interest rates stabilize and/or the sector's  
9 aggregate (FFO)-to-debt ratio remains between 14% to 15%. We  
10 could change our outlook to positive if utility regulation turns broadly  
11 more credit supportive resulting in timelier cash flow recovery or we  
12 expect the sector's aggregate (FFO)-to-debt ratio to rise above 17% on  
13 a sustained basis.<sup>6</sup>

14 Fitch Ratings ("Fitch") also revised its outlook for the utility sector due to the expectation  
15 for recession:

16 Fitch Ratings sees high natural gas prices, record capital spending and  
17 rising interest rates among the cost pressures weighing on the U.S. utilities  
18 sector in 2023. The rating agency has a "deteriorating" outlook on the  
19 sector after years of a stable view.

20 Other factors behind Fitch's outlook include the Edison Electric Institute  
21 predicting elevated levels of capital expenditures for U.S. electric utilities.  
22 EEI forecasts \$154.7 billion of capital expenditures in 2022, \$159.2 billion  
23 in 2023 and \$155.2 billion in 2024, a sharp increase from \$134.1 billion in  
24 2021.

25 Fitch is also mindful of how a "sharp escalation" in retail rates, which  
26 have increased 14% in 2022, and bill affordability will impact credit  
27 metrics. Higher natural gas prices are a key driver of this spike in retail  
28 rates.<sup>7</sup>

29 As outlined above, S&P, Moody's and Fitch all state concern about utilities' rates  
30 affordability as a critical aspect of utility credit rating. Rate affordability largely should  
31 be considered by the Commission in ensuring that while certain aspects of utilities' cost

---

<sup>6/</sup> *Moody's Investors Service Outlook:* "Regulated Electric and Gas Utilities – US; 2023 Outlook – Negative on higher natural gas prices, inflation and rising interest rates," November 10, 2022 at 1 (emphasis added).

<sup>7/</sup> *S&P Capital IQPro:* "Fitch sees various cost pressures behind 'deteriorating' US utilities outlook at 1, November 14, 2022 (emphasis added).

1 of service are increasing, and must be reflected in the development of rates, but other  
2 aspects such as fair rate of return including return on equity and ratemaking capital  
3 structure may have discretionary elements which the Commission should consider in  
4 awarding an overall rate of return that is fair and reasonable to both the utility and, its  
5 investors, and is consistent with adjusting rates with a mind toward maintaining rate  
6 affordability to customers.

7 ***D. Additional Remarks***

8 **Q. PLEASE COMMENT ON RUSSIA’S INVASION OF UKRAINE AND ITS**  
9 **IMPACT ON THE MARKET.**

10 **A.** In late February 2022, Russia invaded Ukraine. The response from the United States and  
11 several other countries around the world has included several rounds of economic  
12 sanctions on Russia. There is no denying the fact that the ongoing conflict in Ukraine  
13 and the economic sanctions levied on Russia have sparked a fair amount of volatility and  
14 uncertainty in some capital markets around the world.

15 While the actual and ongoing impact to the markets and global economy because  
16 of the current conflict remains to be seen, we can look at research on the markets during  
17 previous wars and armed combat situations to get an idea of what can be expected.

18 For example, a monograph published by the CFA Institute Research Foundation  
19 concluded as follows:

20 Both wars and terrorist attacks tend to have only a transitory impact on  
21 financial markets, but clear exceptions test that tendency. The  
22 macroeconomic impact of wars tends to be significantly bigger in small  
23 economies and developing countries that cannot digest the negative effects  
24 of war as easily as large, open economies—such as that of the United  
25 States—can.<sup>8</sup>

---

<sup>8/</sup> Klement CFA, Joachim, CFA Institute Research Foundation, 2021, “Geo-Economics: The interplay of geopolitics, economics, and investments” at 46 (emphasis added).

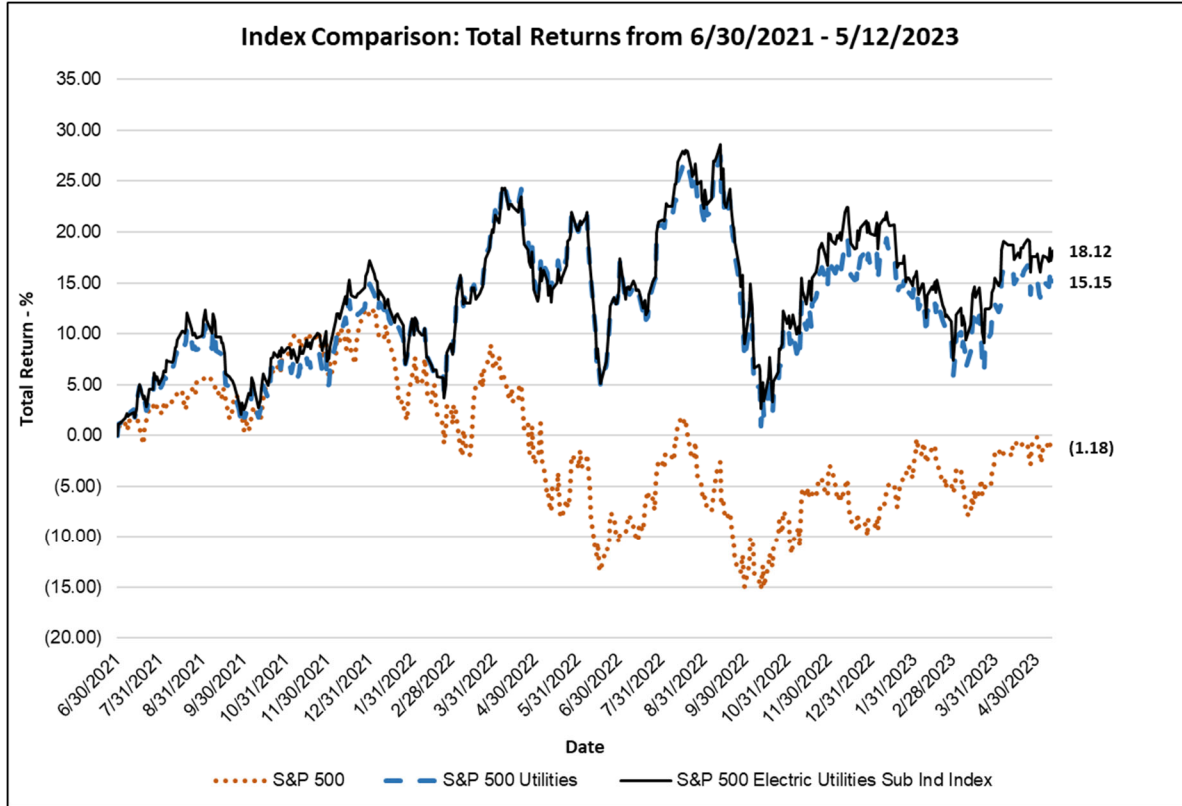
1           While it is undeniable that a level of uncertainty exists because of the conflict in  
2           Ukraine, historical evidence indicates that the impact on financial markets is generally  
3           transitory.

4   **Q.   IN LIGHT OF HIGHER LEVELS OF INFLATION, EXPECTATIONS OF**  
5   **HIGHER INTEREST RATES, AND THE WAR IN UKRAINE, HOW HAS THE**  
6   **MARKET PERCEIVED UTILITIES AS INVESTMENT OPTIONS?**

7   **A.**   Since the end of the second quarter 2021, utilities in general, as measured by the S&P  
8           500 Utilities index (+15.15%), as well as electric utilities specifically (+18.12%), have  
9           significantly outperformed the market as measured by the S&P 500 (-1.18%). This is  
10          presented below in Figure CCW-4. This indicates that utility valuations remain robust,  
11          even during a period of elevated inflation, rising interest rates, and uncertainty because of  
12          geopolitical events around the world.



FIGURE CCW-4



1

### III. RETURN ON EQUITY

2 **Q. PLEASE DESCRIBE WHAT IS MEANT BY A “UTILITY’S COST OF**  
3 **COMMON EQUITY.”**

4 **A.** A utility’s cost of common equity is the expected return that investors require on an  
5 investment in the utility. Investors expect to earn their required return from receiving  
6 dividends and through stock price appreciation.

7 **Q. PLEASE DESCRIBE THE FRAMEWORK FOR DETERMINING A**  
8 **REGULATED UTILITY’S COST OF COMMON EQUITY.**

9 **A.** In general, determining a fair cost of common equity for a regulated utility has been  
10 framed by two hallmark decisions of the U.S. Supreme Court: Bluefield Water Works &  
11 Improvement Co. v. Pub. Serv. Comm’n of W. Va., 262 U.S. 679 (1923) and Fed. Power  
12 Comm’n v. Hope Natural Gas Co., 320 U.S. 591 (1944). In these decisions, the Supreme

1 Court found that just compensation depends on many circumstances and must be  
2 determined by fair and enlightened judgments based on relevant facts. The Court also  
3 found that a utility is entitled to such rates as would permit it to earn a return on a  
4 property devoted to the convenience of the public that is generally consistent with the  
5 same returns available in other investments of corresponding risk. The Court continued  
6 that the utility has “no constitutional rights to profits” such as those “realized or  
7 anticipated in highly profitable enterprises or speculative ventures,”<sup>9</sup> and defined the  
8 ratepayer/investor balance as follows:

9 The return should be reasonably sufficient to assure confidence in the  
10 financial soundness of the utility and should be adequate, under efficient  
11 and economical management, to maintain and support its credit and enable  
12 it to raise the money necessary for the proper discharge of its public  
13 duties.<sup>10</sup>

14 As such, a fair rate of return is based on the expectation that the utility costs  
15 reflect efficient and economical management, and the return will support its credit  
16 standing and access to capital, but the return will not be in excess of this level. Utility  
17 rates that are consistent with these standards will be just and reasonable, and  
18 compensation to the utility will be fair and support financial integrity and credit standing,  
19 under economic management of the utility.

20 **Q. PLEASE DESCRIBE THE METHODS YOU HAVE USED TO ESTIMATE PGE’S**  
21 **COST OF COMMON EQUITY.**

22 **A.** I have used several models based on financial theory to estimate PGE’s cost of common  
23 equity. These models are: (1) a constant growth Discounted Cash Flow (“DCF”) model  
24 using consensus analysts’ growth rate projections; (2) a constant growth DCF using  
25 sustainable growth rate estimates; (3) a multi-stage growth DCF model; (4) a Risk

---

<sup>9/</sup> *Bluefield*, 262 U.S. at 692-93.

<sup>10/</sup> *Id.* at 693 (emphasis added).

1 Premium model; and (5) a Capital Asset Pricing Model (“CAPM”).

2 **A. PGE’s Investment Risk**

3 **Q. PLEASE DESCRIBE THE MARKET’S ASSESSMENT OF PGE’S INVESTMENT**  
4 **RISK.**

5 **A.** The market’s assessment of a company’s investment risk is generally described by credit  
6 rating analysts’ reports. The current credit ratings for PGE from S&P and Moody’s are  
7 BBB+ and A3, respectively.<sup>11</sup> The Company has a “negative” outlook from S&P and  
8 Moody’s as well.

9 Specifically, in its most recent report covering PGE, S&P states:

10 **Business Risk**

11 Our assessment of PGE's business risk profile incorporates the very low  
12 risk of the regulated utility industry, as well as its constructive regulatory  
13 environment, midsize customer base, competitive rates across customer  
14 classes, and above-average customer growth. This is partially offset by the  
15 company's limited geographic and regulatory diversity given the  
16 concentration of its operations in Oregon. We expect the utility to manage  
17 its regulatory relationships, including by successfully navigating state  
18 energy policies and complex environmental mandates. PGE's operating  
19 efficiency has improved through the increased diversity of its fuel mix and  
20 reduction of its fuel concentrations (particularly in hydro and coal). We  
21 expect the company will continue to transition and diversify its generation  
22 portfolio.

23 We assess PGE's business risk profile as being at the lower end of the  
24 range for its category relative to those of its peers, which reflects its lack  
25 of regulatory diversity, midsize customer base, and the ongoing  
26 diversification of its generation portfolio. Therefore, we apply a negative  
27 one-notch comparable ratings analysis modifier to our anchor on the  
28 company to capture these risks.

29 **Financial Risk**

30 We assess PGE's financial measures using our medial volatility financial  
31 ratio benchmarks due to its lower-risk, rate-regulated electric and gas  
32 utility operations and generally effective management of regulatory risk.  
33 Under our base-case scenario, we assume FFO to debt of 17.0%-19.0%  
34 over the next two years. Our forecast over the next two years also assumes  
35 base-rate relief, average capital spending of about \$650 million, \$150

---

<sup>11</sup>S&P Capital IQ, accessed on May 12, 2023.

1 million-\$170 million of annual dividends, the continued use of regulatory  
2 mechanisms, and above-average customer and load growth.<sup>12</sup>

3 **B. PGE's Proposed Capital Structure**

4 **Q. WHAT IS PGE'S PROPOSED CAPITAL STRUCTURE?**

5 **A.** PGE's proposed capital structure is summarized in Table CCW-6 below:

<b>TABLE CCW-6</b>	
<b><u>Investor-Supplied Capital Structure</u></b>	
<b><u>Description</u></b>	<b><u>Weight</u></b>
Debt	50.00%
Common Equity	<u>50.00%</u>
Total	100.00%

6 **Q. DO YOU HAVE ANY COMMENTS ON PGE'S PROPOSED CAPITAL**  
7 **STRUCTURE?**

8 **A.** Yes. As I will discuss later, PGE's proposed equity ratio of 50.0% significantly exceeds  
9 the equity ratio for the proxy group used to estimate the cost of equity for PGE. As  
10 shown on AWEC-CUB/103, the proxy group has an average common equity ratio of  
11 41.2% (including short-term debt) and 44.8% (excluding short-term debt). However, the  
12 Company's request is largely in-line with what has been awarded to other electric utilities  
13 throughout the United States in recent years.

14 **Q. ARE YOU AWARE OF OTHER REGULATORY COMMISSIONS**  
15 **RECOGNIZING THE NEED TO ALIGN THE COST OF EQUITY WITH THE**  
16 **CAPITAL STRUCTURE?**

17 **A.** Yes. In a recent Order, the Arkansas Public Service Commission imputed the capital  
18 structure of Southwestern Electric Power Company ("SWEPCO") to be more in-line with

---

<sup>12/</sup> *S&P RatingsDirect*<sup>®</sup>: "Full Analysis: Portland General Electric Co.," December 14, 2022.

1 the comparable companies used to estimate the cost of equity.<sup>13</sup> The adjustment was to  
2 recognize that there must be *congruence* between the cost of equity and the capital  
3 structure. Specifically, the Order states as follows:

4 Consistent with our ruling in Order No. 10 of Docket No. 06-101-U, the  
5 Commission holds that there should be congruence between the estimated  
6 cost of equity and the [debt-to-equity “PGE”] ratio, whereby a lower PGE  
7 ratio decreases financial risk and decreases the cost of equity. The  
8 evidence of record supports imputing the average capital structure of  
9 companies with comparable risk to SWEPCO for the purposes of  
10 determining SWEPCO’s overall cost of capital.<sup>14</sup>

11 As I described above, the proxy group has an average common equity ratio of  
12 41.2% (including short-term debt) and 44.8% (excluding short-term debt) as calculated  
13 by S&P Global Market Intelligence and *Value Line*, respectively. The Company’s  
14 proposed equity ratio of 50.00% (excluding short-term debt) is more than five percentage  
15 points higher than that of the proxy group’s comparable equity ratio.

16 **Q. ARE YOU PROPOSING ANY ADJUSTMENTS TO THE COMPANY’S**  
17 **CAPITAL STRUCTURE AT THIS TIME?**

18 **A.** No, I am not.

19 **C. Development of Proxy Group**

20 **Q. PLEASE BRIEFLY DESCRIBE WHY A PROXY GROUP IS NEEDED IN**  
21 **ESTIMATING THE COST OF EQUITY.**

22 **A.** There are a few reasons why a proxy group is needed to estimate the cost of equity. As  
23 an initial matter, to be consistent with the *Hope* and *Bluefield* standards, as described  
24 above, the allowed return should be commensurate with returns on investments in other  
25 firms of comparable risk. A proxy group of similarly situated companies of comparable  
26 risk is needed to assess the Company's proposal under this standard.

---

<sup>13/</sup> Arkansas Public Service Commission Docket No. 21-170-U, Doc. No. 323, May 23, 2022, Order No. 14.

<sup>14/</sup> *Id.* at 25.

1 Even if PGE were a publicly traded company whose securities could be used to  
2 estimate its cost of equity, there exists the potential for certain errors and biases making  
3 the reliance on a single estimate undesirable and potentially less accurate. A proxy group  
4 of comparable risk companies adds reliability to the estimates by mitigating the potential  
5 for bias that may be introduced by measurement errors of model inputs.

6 **Q. PLEASE DESCRIBE HOW YOU IDENTIFIED A PROXY UTILITY GROUP**  
7 **THAT COULD BE USED TO ESTIMATE PGE'S CURRENT MARKET COST**  
8 **OF EQUITY.**

9 **A.** I relied on the same electric proxy group developed by PGE witness Dr. Villadsen with  
10 one exception: MGE Energy. I excluded MGE Energy from the proxy group because, at  
11 the time of my analysis (i.e., May 12, 2023), it was not a followed entity in the *Value*  
12 *Line Investment Survey*.

13 **Q. HOW DOES THE INVESTMENT RISK OF PGE COMPARE TO THAT OF THE**  
14 **PROXY GROUP?**

15 **A.** As shown on my AWEC-CUB/103, the proxy group has average credit ratings of BBB+  
16 and Baa2 from S&P and Moody's, respectively. The proxy group's average rating of  
17 BBB+ from S&P is identical to PGE's BBB+ rating from S&P. The proxy group's  
18 average rating of Baa2 from Moody's is two notches lower than PGE's rating of A3.

19 As shown on the same exhibit, the proxy group has an average common equity  
20 ratio of 41.2% (including short-term debt) and 44.8% (excluding short-term debt) as  
21 calculated by S&P Global Market Intelligence and *Value Line*, respectively. PGE's  
22 requested common equity ratio of 50.00% (excluding short-term debt) significantly  
23 exceeds the proxy group's equity ratio as described above.

24 Given the differences in equity ratios and credit ratings between PGE and the  
25 proxy group, an ROE in the lower half of my range would be warranted.

1 **D. DCF Model**

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

3 **A.** The DCF model posits that a stock price equals the sum of the present value of expected  
4 future cash flows discounted at the investor's required rate of return or cost of capital.

5 This model is expressed mathematically as follows:

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

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

11 This model can be rearranged in order to estimate the discount rate or investor-required  
12 return, known as "K." If it is reasonable to assume that earnings and dividends will grow  
13 at a constant rate, then Equation 1 can be rearranged as follows:

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

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 DCF model requires a current stock price, the  
23 expected dividend, and the expected growth rate in dividends.

24 **Q. WHAT STOCK PRICE HAVE YOU RELIED ON IN YOUR CONSTANT**  
25 **GROWTH DCF MODEL?**

26 **A.** I relied on the average of the weekly high and low stock prices of the utilities in the proxy  
27 group over a 13-week period ending on May 12, 2023. An average stock price is less  
28 susceptible to market price variations than a price at a single point in time. Therefore, an

1 average stock price is less susceptible to aberrant market price movements, which may  
2 not reflect the stock's long-term value.

3 **Q. WHAT DIVIDEND DID YOU USE IN YOUR CONSTANT GROWTH DCF**  
4 **MODEL?**

5 **A.** I used each proxy company's most recently paid quarterly dividend as reported in *Value*  
6 *Line*.<sup>15</sup> This dividend was annualized (multiplied by 4) and adjusted for next year's  
7 growth to produce the  $D_1$  factor for use in Equation 2 above. In other words, I calculate  
8  $D_1$  by multiplying the annualized dividend ( $D_0$ ) by  $(1+G)$ .

9 **Q. WHAT DIVIDEND GROWTH RATES HAVE YOU USED IN YOUR CONSTANT**  
10 **GROWTH DCF MODEL?**

11 **A.** There are several methods that can be used to estimate the expected growth in dividends.  
12 However, regardless of the method, for purposes of determining the market-required  
13 return on common equity, one must attempt to estimate investors' expectations about  
14 what the dividend, or earnings growth rate will be and not what an individual investor or  
15 analyst may use to make individual investment decisions.

16 As predictors of future returns, securities analysts' growth estimates have been  
17 shown to be more accurate than growth rates derived from historical data.<sup>16</sup> That is,  
18 assuming the market generally makes rational investment decisions, analysts' growth  
19 projections are more likely to influence investors' decisions, which are captured in  
20 observable stock prices, than growth rates derived only from historical data.

21 For my constant growth DCF analysis, I have relied on a consensus, or mean, of  
22 professional securities analysts' earnings growth estimates as a proxy for investors'  
23 dividend growth rate expectations. I used the average of analysts' growth rate estimates

---

<sup>15/</sup> *The Value Line Investment Survey.*

<sup>16/</sup> See, e.g., David Gordon, Myron Gordon, and Lawrence Gould, Choice Among Methods of Estimating Share Yield, *The Journal of Portfolio Management*, Spring 1989.



1 from three sources: Zacks, S&P Capital IQ Market Intelligence (“MI”), and Yahoo!  
2 Finance. All such projections were available on May 12, 2023, and all were reported  
3 online.<sup>17</sup>

4 Each growth rate projection is based on a survey of independent securities  
5 analysts. There is no clear evidence whether a particular analyst is most influential on  
6 general market investors. Therefore, a single analyst’s projection does not predict  
7 investor outlooks as reliably as does a consensus of market analysts’ projections. The  
8 consensus of estimates is a simple arithmetic average, or mean, of surveyed analysts’  
9 earnings growth forecasts. A simple average of the growth forecasts gives equal weight  
10 to all surveyed analysts’ projections. Therefore, a simple average, or arithmetic mean, of  
11 analysts’ forecasts is a good proxy for investor expectations.

12 The growth rates I used in my DCF analysis are shown in AWEC-CUB/104. The  
13 average growth rate for my proxy group is 6.26% and a median growth rate of 6.04%.

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

15 **A.** As shown in AWEC-CUB/105, page 1, the average and median constant growth DCF  
16 returns for my proxy group for the 13-week analysis are 10.14% and 10.01%,  
17 respectively.

18 **Q. DO YOU HAVE ANY COMMENTS ON THE RESULTS OF YOUR CONSTANT**  
19 **GROWTH DCF ANALYSIS?**

20 **A.** Yes. The constant growth DCF analysis for my proxy group is based on a group average  
21 long-term growth rate of 6.26%. The three- to five-year growth rates are approximately  
22 47% higher than the long-term projected GDP growth rate of 4.00%, described below.  
23 As I explain in detail below, a utility’s growth rate cannot exceed the growth rate of the

---

<sup>17/</sup> [www.zacks.com](http://www.zacks.com); <https://finance.yahoo.com>; and <https://www.capitaliq.spglobal.com/>.

1 economy in which it provides services in perpetuity, which is the time period assumed by  
2 the DCF model.

3 **Q. HOW DID YOU IDENTIFY THE LONG-TERM PROJECTED GDP GROWTH**  
4 **RATE?**

5 **A.** Although there may be short-term peaks, the long-term sustainable growth rate for a  
6 utility stock cannot exceed the growth rate of the economy in which it sells its goods and  
7 services. The long-term maximum sustainable growth rate for a utility investment is  
8 limited by the projected long-term GDP growth rate as that reflects the projected long-  
9 term growth rate of the economy as a whole. *Blue Chip Economic Indicators* projects  
10 that over the next 5 and 10 years, the U.S. nominal GDP will grow at an annual rate of  
11 approximately 4.00%.<sup>18</sup> As such, the average nominal growth rate over the next 10 years  
12 is around 4.00%, which I believe is a reasonable proxy of long-term growth.

13 Later in this testimony, I discuss academic and investment practitioner support for  
14 using the projected long-term GDP growth outlook as a maximum long-term growth rate  
15 projection. Using the long-term GDP growth rate as a conservative projection for the  
16 maximum growth rate is logical and is generally consistent with academic and economic  
17 practitioner accepted practices.

18 ***E. Sustainable Growth DCF***

19 **Q. PLEASE DESCRIBE WHAT THE SUSTAINABLE GROWTH DCF METHOD IS**  
20 **AND HOW YOU ESTIMATED A SUSTAINABLE GROWTH RATE FOR YOUR**  
21 **SUSTAINABLE GROWTH DCF MODEL.**

22 **A.** The sustainable growth rate, also referred to as the internal growth rate, is determined by  
23 the proportion of the utility's earnings that is retained and reinvested in its plant and  
24 equipment. These reinvested earnings enhance the earnings base, also known as the rate

---

<sup>18/</sup> Blue Chip Economic Indicators March 10, 2023, at page 14.

1 base. The earnings grow as the plant, funded by the reinvested earnings, is put into  
2 operation, allowing the utility to receive its authorized return on the additional rate base  
3 investment.

4 The internal growth approach is linked to the percentage of earnings retained  
5 within the company, as opposed to being paid out as dividends. The earnings retention  
6 ratio is calculated as 1 minus the dividend payout ratio. As the payout ratio decreases, the  
7 retention ratio increases, leading to stronger growth as the company funds more  
8 investments using retained earnings.

9 The payout ratios of the proxy group are shown in my AWEC-CUB/106. These  
10 dividend payout ratios and earnings retention ratios can then be used to develop a long-  
11 term growth rate driven by earnings retention.

12 The data used to estimate the long-term sustainable growth rate is based on the  
13 Company's current market-to-book ratio and on *Value Line's* three- to five-year  
14 projections of earnings, dividends, earned returns on book equity, and stock issuances.

15 As shown in AWEC-CUB/107, the average and median sustainable growth rates  
16 for the proxy group using this internal growth rate model are 5.06% and 5.02%,  
17 respectively.

18 **Q. WHAT IS THE DCF ESTIMATE USING THESE SUSTAINABLE GROWTH**  
19 **RATES?**

20 **A.** A DCF estimate based on these sustainable growth rates is developed in  
21 AWEC-CUB/108. As shown there, and using the same formula in Equation 2 above, a  
22 sustainable growth DCF analysis produces proxy group average and median DCF results  
23 for the 13-week period of 8.89% and 8.72%, respectively.

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

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

3 **A.** Yes. As previously noted, the DCF model is intended to represent the present value of an  
4 endless series of future cash flows. Nevertheless, the initial constant growth DCF that I  
5 created is based on analyst growth rate projections, providing a plausible representation  
6 of rational investment expectations over the next three to five years. The limitation of this  
7 constant growth DCF model is that it cannot reflect a reasonable expectation of a shift in  
8 growth from a high or low short-term rate to a rate that aligns more with long-term  
9 sustainable growth. To accommodate changing growth expectations, I conducted a multi-  
10 stage DCF analysis that reflects growth rate change over time.

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

12 **A.** The growth rate projections for the next three to five years by analysts are subject to  
13 change as the outlook for utility earnings growth evolves. Utility companies experience  
14 fluctuations in their investment cycles. When these companies are undertaking substantial  
15 investments, the growth of their rate base accelerates, leading to an increase in earnings  
16 growth. However, once a major construction cycle reaches completion or plateaus, the  
17 growth in the utility rate base slows down, and its earnings growth rate declines from an  
18 abnormally high three to five-year rate to a lower, sustainable growth rate.

19 As construction cycles become longer in duration, even with an aggressive  
20 construction plan, the growth rate of the utility will naturally slow due to a decrease in  
21 rate base growth, as the utility has limited human and capital resources to expand its  
22 construction activities. Therefore, the three to five-year growth rate projection should be  
23 viewed as a long-term sustainable growth rate, but not without considering the current  
24 market conditions, industry trends, and determining whether the three to five-year growth

1 outlook is feasible and sustainable.

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

3 **A.** The multi-stage DCF model reflects the possibility of non-constant growth for a company  
4 over time. The multi-stage DCF model reflects three growth periods: (1) a short-term  
5 growth period consisting of the first five years; (2) a transition period, consisting of the  
6 next five years (6 through 10); and (3) a long-term growth period starting in year 11 and  
7 extending into perpetuity.

8 For the short-term growth period, I relied on the consensus of analysts' growth  
9 projections described above in relationship to my constant growth DCF model. For the  
10 transition period, the growth rates were reduced or increased by an equal factor reflecting  
11 the difference between the analysts' growth rates and the long-term sustainable growth  
12 rate. For the long-term growth period, I assumed each company's growth would  
13 converge to the maximum sustainable long-term growth rate.

14 **Q. WHY IS THE GDP GROWTH PROJECTION A REASONABLE PROXY FOR**  
15 **THE MAXIMUM SUSTAINABLE LONG-TERM GROWTH RATE?**

16 **A.** Utilities cannot indefinitely sustain a growth rate that exceeds the growth rate of the  
17 economy in which they sell services. Utilities' earnings and dividend growth is created  
18 by increased utility investment in its rate base. Examples of what can drive such  
19 investment are service area economic growth, system reliability upgrades, or state and  
20 federal green energy initiatives. As a result, nominal GDP growth is a reasonable upper  
21 limit for utility sales growth, rate base growth, and earnings growth in the long-run.  
22 Therefore, the U.S. GDP nominal growth rate is a conservative proxy for the highest  
23 sustainable long-term growth rate of a utility.

1 **Q. IS THERE RESEARCH THAT SUPPORTS YOUR POSITION THAT, OVER**  
2 **THE LONG TERM, A COMPANY’S EARNINGS AND DIVIDENDS CANNOT**  
3 **GROW AT A RATE GREATER THAN THE GROWTH OF THE U.S. GDP?**

4 **A.** Yes. This concept is supported in published analyst literature and academic work.  
5 Specifically, in a textbook titled “Fundamentals of Financial Management,” published by  
6 Eugene Brigham and Joel F. Houston, the authors state as follows:

7 The constant growth model is most appropriate for mature companies with  
8 a stable history of growth and stable future expectations. Expected growth  
9 rates vary somewhat among companies, but dividends for mature firms are  
10 often expected to grow in the future at about the same rate as nominal  
11 gross domestic product (real GDP plus inflation).<sup>19</sup>

12 The use of the economic growth rate is also supported by investment practitioners as  
13 outlined as follows:

#### 14 **Estimating Growth Rates**

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

21 \* \* \*

22 Another approach to estimating long-term growth rates is to focus on  
23 estimating the overall economic growth rate. Again, this is the approach  
24 used in the *Ibbotson Cost of Capital Yearbook*. To obtain the economic  
25 growth rate, a forecast is made of the growth rate’s component parts.  
26 Expected growth can be broken into two main parts: expected inflation  
27 and expected real growth. By analyzing these components separately, it is  
28 easier to see the factors that drive growth.<sup>20</sup>

---

<sup>19/</sup> *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).

<sup>20/</sup> Morningstar, Inc., Ibbotson SBI 2013 Valuation Yearbook at 51 and 52.

1 **Q. HOW DID YOU DETERMINE A LONG-TERM GROWTH RATE THAT**  
2 **REFLECTS THE CURRENT CONSENSUS OF INDEPENDENT MARKET**  
3 **PARTICIPANTS?**

4 **A.** I relied on the consensus of long-term GDP growth projections as projected by  
5 independent economists. *Blue Chip Economic Indicators* publishes the consensus for  
6 GDP growth projections twice a year. These projections reflect current outlooks for GDP  
7 and are likely to be influential on investors' expectations of future growth outlooks. The  
8 consensus of projected GDP growth is about 4.00% over the next 10 years.<sup>21</sup>

9 **Q. DO YOU CONSIDER OTHER SOURCES OF PROJECTED LONG-TERM GDP**  
10 **GROWTH?**

11 **A.** Yes, and these alternative sources corroborate the consensus analysts' projections I relied  
12 on. Several projections are shown in Table CCW-7 below.

---

<sup>21/</sup> Blue Chip Economic Indicators March 10, 2023, at page 14.

**TABLE CCW-7**

**GDP Forecasts**

<u>Source</u>	<u>Projected Period</u>	<u>Real GDP</u>	<u>Inflation</u>	<u>Nominal GDP</u>
Blue Chip Financial Forecasts <sup>1</sup>	5-10 Yrs	1.9%	2.1%	4.0%
EIA - Annual Energy Outlook <sup>2</sup>	29 Yrs	2.2%	2.3%	4.5%
Congressional Budget Office <sup>3</sup>	30 Yrs	1.6%	2.1%	3.7%
Moody's Analytics <sup>4</sup>	31 Yrs	2.0%	2.0%	4.0%
Social Security Administration <sup>5</sup>	78 Yrs			4.1%
Economist Intelligence Unit <sup>6</sup>	30 Yrs	1.8%	2.2%	4.1%

Sources:

<sup>1</sup>Blue Chip Financial Forecasts, December 2, 2022 at 14.

<sup>2</sup>U.S. Energy Information Administration (EIA), Annual Energy Outlook 2022, March 3, 2022.

<sup>3</sup>Congressional Budget Office, Long-Term Budget Outlook, July 2022.

<sup>4</sup>Moody's Analytics Forecast, downloaded January 17, 2023.

<sup>5</sup>Social Security Administration, "2022 OASDI Trustees Report," Table VI.G4, June 2, 2022.

<sup>6</sup>S&P MI, Economist Intelligence Unit, downloaded on February 14, 2023.

1 As shown in the table above, the real GDP and the inflation fall in the range of  
 2 1.60% to 2.20% and 2.1% to 2.3%, respectively. This results in a nominal GDP in the  
 3 range of 3.7% to 4.5%. Therefore, the nominal GDP growth projections made by these  
 4 independent sources support my use of 4.00% as a reasonable estimate of market  
 5 participants' expectations for long-term GDP growth. The real GDP and nominal GDP  
 6 growth projections made by these independent sources support my use of 4.00% as a  
 7 reasonable estimate of market participants' expectations for long-term GDP growth.



1 **Q. WHAT STOCK PRICE, DIVIDEND, AND GROWTH RATES DID YOU USE IN**  
2 **YOUR MULTI-STAGE DCF ANALYSIS?**

3 **A.** I relied on the same 13-week average stock prices and the most recent quarterly dividend  
4 payment data discussed above. For the first stage, I used the consensus of analysts'  
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 6  
8 and extends through year 10. The second stage growth transitions the growth rate from  
9 the first stage to the third stage using a straight linear trend. For the third stage, or  
10 long-term sustainable growth stage, starting in year 11, I used a 4.00% long-term  
11 sustainable growth rate based on the consensus of economists' long-term projected  
12 nominal GDP growth rate.

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

14 **A.** As shown in AWEC-CUB/109, the average and median DCF ROEs for my proxy group  
15 using the 13-week average stock price are 8.37% and 8.20%, respectively.

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

17 **A.** The DCF results are summarized in Table CCW-8 below. It is my opinion a reasonable  
18 ROE based on the DCF results summarized in Table CCW-8 is 9.20%.

<b>TABLE CCW-8</b>		
<b><u>Summary of DCF Results</u></b>		
<b><u>Description</u></b>	<b><u>Proxy Group</u></b>	
	<b><u>Average</u></b>	<b><u>Median</u></b>
Constant Growth DCF Model (Analysts' Growth)	10.14%	10.01%
Constant Growth DCF Model (Sustainable Growth)	8.89%	8.72%
Multi-Stage DCF Model	8.37%	8.20%

1 **G. Risk Premium Model**

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

3 **A.** This model is based on the principle that investors require a higher return to assume  
 4 greater risk. Common equity investments have greater risk than bonds because bonds  
 5 have more security of payment in bankruptcy proceedings than common equity and the  
 6 coupon payments on bonds represent contractual obligations. In contrast, companies are  
 7 not required to pay dividends or guarantee returns on common equity investments.  
 8 Therefore, common equity securities are considered to be riskier than bond securities.

9 This risk premium model is based on two estimates of an equity risk premium.  
 10 First, I quantify the difference between regulatory commission-authorized returns on  
 11 common equity and contemporary U.S. Treasury bonds. The difference between the  
 12 authorized return on common equity and the Treasury bond yield is the risk premium. I  
 13 estimated the risk premium on an annual basis for each year since January 1986. The  
 14 authorized ROEs were based on regulatory commission-authorized returns for utility  
 15 companies. Authorized returns are typically based on expert witnesses' estimates of the

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

2 The second equity risk premium estimate is based on the difference between  
3 regulatory commission-authorized returns on common equity and contemporary  
4 “A” rated utility bond yields by Moody’s. I selected the period 1986 through 2021  
5 because public utility stocks consistently traded at a premium to book value during that  
6 period. This is illustrated in AWEC-CUB/110, which shows the market-to-book ratio  
7 since 1986 for the utility industry was consistently above a multiple of 1.0x. Over this  
8 period, an analyst can infer that authorized ROEs were sufficient to support market prices  
9 that at least exceeded book value. This is an indication that commission-authorized  
10 returns on common equity supported a utility’s ability to issue additional common stock  
11 without diluting existing shares. It further demonstrates that utilities were able to access  
12 equity markets without a detrimental impact on current shareholders.

13 Based on this analysis, as shown in AWEC-CUB/111, the average indicated  
14 equity risk premium over U.S. Treasury bond yields has been 5.71%. Since the risk  
15 premium can vary depending upon market conditions and changing investor risk  
16 perceptions, I believe using an estimated range of risk premiums provides the best  
17 method to measure the current return on common equity for a risk premium  
18 methodology.

19 I assessed the five-year and ten-year rolling average risk premiums over the study  
20 period to gauge the variability over time of risk premiums. These rolling average risk  
21 premiums mitigate the impact of anomalous market conditions and skewed risk  
22 premiums over an entire business cycle. As shown on my AWEC-CUB/111, the  
23 five-year rolling average risk premium over Treasury bonds ranged from 4.25% to

1 7.09%, while the ten-year rolling average risk premium ranged from 4.38% to 6.91%.

2 As shown on my AWEC-CUB/112, the average indicated equity risk premium  
3 over contemporary “A” rated Moody’s utility bond yields was 4.35%. The five-year and  
4 ten-year rolling average risk premiums ranged from 2.88% to 5.90% and 3.20% to  
5 5.73%, respectively.

6 **Q. DO YOU BELIEVE THAT THE TIME PERIOD USED TO DERIVE THESE**  
7 **EQUITY RISK PREMIUM ESTIMATES IS APPROPRIATE TO FORM**  
8 **ACCURATE CONCLUSIONS ABOUT CONTEMPORARY MARKET**  
9 **CONDITIONS?**

10 **A.** Yes. Contemporary market conditions can change dramatically during the period that  
11 rates determined in this proceeding will be in effect. A relatively long period of time  
12 where stock valuations reflect premiums to book value indicates that the authorized  
13 ROEs and the corresponding equity risk premiums were supportive of investors’ return  
14 expectations and provided utilities access to the equity markets under reasonable terms  
15 and conditions. Further, this time period is long enough to smooth abnormal market  
16 movement that might distort equity risk premiums. While market conditions and risk  
17 premiums do vary over time, this historical time period is a reasonable period to estimate  
18 contemporary risk premiums.

19 **Q. PLEASE EXPLAIN OTHER MARKET EVIDENCE YOU RELIED ON IN**  
20 **DETERMINING AN APPROPRIATE EQUITY RISK PREMIUM.**

21 **A.** The equity risk premium should reflect the market’s perception of risk in the utility  
22 industry today. I have gauged investor perceptions in utility risk today in  
23 AWEC-CUB/113, where I show the yield spread between utility bonds and Treasury  
24 bonds since 1980. As shown in this schedule, the average utility bond yield spreads over  
25 Treasury bonds for “A” and “Baa” rated utility bonds for this historical period are 1.49%  
26 and 1.91%, respectively.

1           A current 13-week average “A” rated utility bond yield of 5.26% when compared  
2           to the current Treasury bond yield of 3.74%, as shown in AWEC-CUB/114, page 1,  
3           implies a yield spread of 1.52%. This current utility bond yield spread is slightly higher  
4           than the long-term average spread for “A” rated utility bonds of 1.49%. The 13-week  
5           average yield on “Baa” rated utility bonds is 5.57%. This indicates a current spread for  
6           the “Baa” rated utility bond yield of 1.83%, which is slightly lower than the long-term  
7           average of 1.91%.

8   **Q.   WHAT IS YOUR RECOMMENDED RETURN FOR THE COMPANY BASED**  
9   **ON YOUR RISK PREMIUM STUDY?**

10   **A.**   Considering the current economic environment, current levels of interest rates as well as  
11           interest rate projections, a move toward a more normalized equity risk premium is  
12           warranted.

13           A risk premium between the 50<sup>th</sup> and 75<sup>th</sup> percentile (i.e., the third quartile) of the  
14           rolling five-year average risk premiums would be appropriate in the current market. The  
15           third quartile would be for the observations that are equal to or above the 50<sup>th</sup> percentile  
16           observation, and equal to or below the 75<sup>th</sup> percentile. I believe the average of the third  
17           quartile represents a reasonable risk premium. As such, I believe an equity risk premium  
18           over Treasury yields of 6.04% is appropriate given the current economic environment  
19           and interest rate projection of 3.70%. Adding this risk premium to the projected Treasury  
20           yield of 3.70% produces an ROE of 9.74%.

21           Applying a similar methodology as described above, the average of the third  
22           quartile produces an equity risk premium of 4.63%. The A-rated utility bond yield has  
23           averaged 5.26% over the 13-week period ending May 12, 2023 while the Baa-rated utility  
24           bond yield has averaged 5.57% over the same period. Adding this risk premium to the

1 13-week A-rated utility bond yield of 5.26% produces an estimated cost of equity of  
2 9.89%. Adding this risk premium to the 13-week Baa-rated utility bond yield of 5.57%  
3 produces an estimated cost of equity of 10.20%.

4 The A-rated utility bond yield has averaged 5.27% over the 26-week period  
5 ending May 12, 2023 while the Baa-rated utility bond yield has averaged 5.57% over the  
6 same period. Adding this risk premium to the 26-week A-rated utility bond yield of  
7 5.27% produces an estimated cost of equity of 9.90%. Adding this risk premium to the  
8 26-week Baa-rated utility bond yield of 5.57% produces an estimated cost of equity of  
9 10.20%.

10 The results of my risk premium analyses are summarized in Table CCW-9. Based  
11 on these results, I conclude that a reasonable ROE based on my risk premium analyses is  
12 9.90%.

<b>TABLE CCW-9</b>	
<b><u>Summary of Risk Premium Results</u></b>	
<b><u>Description</u></b>	
Projected Treasury Yield	9.74%
<b><u>13-Week Yields</u></b>	
A-Rated Utility Bond	9.89%
Baa-Rated Utility Bond	10.20%
<b><u>26-Week Yields</u></b>	
A-Rated Utility Bond	9.90%
Baa-Rated Utility Bond	10.20%

1 **H. Capital Asset Pricing Model (“CAPM”)**

2 **Q. PLEASE DESCRIBE THE CAPM.**

3 **A.** The CAPM method of analysis is based upon the theory that the market-required rate of  
4 return for a security is equal to the risk-free rate, plus a risk premium associated with the  
5 specific security. This relationship between risk and return can be expressed  
6 mathematically as follows:

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

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 term "beta" in the equation represents the stock-specific risk that cannot be reduced  
13 through diversification. In a well-diversified portfolio, specific risks related to individual  
14 stocks can be reduced by balancing the portfolio with securities that offset the impact of  
15 firm-specific factors, such as business cycle, competition, product mix, and production  
16 limitations.

17 Non-diversifiable risks, on the other hand, are related to market conditions and are  
18 referred to as systematic risks. These risks cannot be reduced through diversification and  
19 are considered market risks. Conversely, non-systematic risks, also known as business  
20 risks, can be reduced through diversification.

21 According to the CAPM, the market does not compensate investors for taking on  
22 risks that can be diversified away. Thus, investors are only compensated for taking on  
23 systematic, or non-diversifiable, risks. Beta is a measure of these systematic risks.

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

25 **A.** The CAPM requires an estimate of the market risk-free rate, the company's beta, and the

1 market risk premium.

2 **Q. WHAT DID YOU USE AS AN ESTIMATE OF THE MARKET RISK-FREE**  
3 **RATE?**

4 **A.** As previously noted, *Blue Chip Financial Forecasts'* projected 30-year Treasury bond  
5 yield is 3.70%.<sup>22</sup> The current 30-year Treasury bond yield is 3.74%, as shown in AWEC-  
6 CUB/114 at page 1. I used *Blue Chip Financial Forecasts'* projected 30-year Treasury  
7 bond yield of 3.70% for my CAPM analysis.

8 **Q. WHY DID YOU USE LONG-TERM TREASURY BOND YIELDS AS AN**  
9 **ESTIMATE OF THE RISK-FREE RATE?**

10 **A.** Treasury securities are backed by the full faith and credit of the United States  
11 government, so long-term Treasury bonds are considered to have negligible credit risk.  
12 Also, long-term Treasury bonds have an investment horizon similar to that of common  
13 stock. As a result, investor-anticipated long-run inflation expectations are reflected in  
14 both common stock required returns and long-term bond yields. Therefore, the nominal  
15 risk-free rate (or expected inflation rate and real risk-free rate) included in a long-term  
16 bond yield is a reasonable estimate of the nominal risk-free rate included in common  
17 stock returns.

18 Treasury bond yields, however, do include risk premiums related to future  
19 inflation and liquidity. In this regard, a Treasury bond yield is not entirely risk-free.  
20 Risk premiums related to unanticipated inflation and interest rates reflect systematic  
21 market risks. Consequently, for a company with a beta less than 1.0, using the Treasury  
22 bond yield as a proxy for the risk-free rate in the CAPM analysis can produce an  
23 overstated estimate of the CAPM return.

---

<sup>22/</sup> Blue Chip Financial Forecast May 1, 2023.



1 **Q. WHAT BETA DID YOU USE IN YOUR ANALYSIS?**

2 **A.** As shown in AWEC-CUB/115, the current proxy group average and median *Value Line*  
3 beta estimates are 0.89 and 0.90, respectively. In my experience, these beta estimates are  
4 abnormally high and are unlikely to be sustained over the long-term. As such, I have also  
5 reviewed the historical average of the proxy group's *Value Line* betas. The historical  
6 average *Value Line* beta since 2014 is 0.76 and has ranged from 0.57 to 0.91. Prior to the  
7 recent pandemic, the high end of this range was 0.75.

8 In addition to *Value Line*, I have also included adjusted beta estimates as provided  
9 by Market Intelligence's Beta Generator Model. This model relied on a five-year period  
10 on a weekly basis ending May 12, 2023. The average and median Market Intelligence  
11 betas are 0.83 and 0.83, respectively. Market Intelligence betas as calculated using its  
12 Beta Generator Model are adjusted using the Vasicek method and calculated using the  
13 S&P 500 as the proxy for the investable market. This is in stark contrast with the *Value*  
14 *Line* beta estimates that are adjusted using a constant weighting of 67%/35% to the raw  
15 beta/market beta and use the New York Stock Exchange as the proxy for the investable  
16 market. Because I rely on the S&P 500 to estimate the expected return on the investable  
17 market, it makes sense to rely on beta estimates that are calculated using the S&P 500 as  
18 the benchmark for the market. Further, as S&P explains:

19 The Vasicek Method is a superior alternative to the Bloomberg Beta  
20 adjustment. The Bloomberg adjustment is not appropriate for a vast  
21 number of situations, as it assigns constant weighting regardless of the  
22 standard error in the raw beta estimation (Bloomberg Beta =  $1/3 \cdot \text{market beta} + 2/3 \cdot \text{Raw Beta}$ ). Given the statistical fact that a larger sample size  
23 yields a smaller error, the Vasicek method more appropriately adjusts the  
24 raw beta via weights determined by the variance of the individual security  
25 versus the variance of a larger sample of comparable companies. The  
26 weights are designed to bring the raw beta closer to whichever beta  
27 estimation has the smallest error. This is a feature the Bloomberg beta  
28

1 cannot replicate.<sup>23</sup>

2 **Q. HOW DID YOU DERIVE YOUR MARKET RISK PREMIUM ESTIMATES?**

3 **A.** My market risk premium estimates are derived using two general approaches: a risk  
4 premium approach and a DCF approach. I also consider the normalized market risk  
5 premium of 6.00% with the normalized risk-free rate of 3.88% as recommended by Kroll,  
6 formerly known as Duff & Phelps.<sup>24</sup> Based on this methodology, and utilizing a  
7 “normalized” risk-free rate of 3.88%, Kroll concludes that the current expected, or  
8 forward-looking, market risk premium is 6.00%, implying an expected return on the  
9 market of 9.88%.<sup>25</sup>

10 **Q. PLEASE DESCRIBE YOUR MARKET RISK PREMIUM ESTIMATE DERIVED**  
11 **USING THE RISK PREMIUM METHODOLOGY.**

12 **A.** The forward-looking risk premium-based estimate was derived by estimating the  
13 expected return on the market (as represented by the S&P 500) and subtracting the risk-  
14 free rate from this estimate. I estimated the expected return on the S&P 500 by adding an  
15 expected inflation rate to the long-term historical arithmetic average real return on the  
16 market. The real return on the market represents the achieved return above the rate of  
17 inflation.

18 The Kroll *2023 SBBI Yearbook* estimates the historical arithmetic average real

---

<sup>23/</sup> S&P Market Intelligence, Beta Generator Model. Notably, while S&P makes reference to the Bloomberg method of applying 2/3 and 1/3 weights to the raw beta and market beta, respectively, the comparison still applies to *Value Line*'s methodology of applying 67% and 35% weights. Both methods are forms of the Blume adjustment. While the weights are slightly different between the Bloomberg and *Value Line* methods, they are similar and apply a constant weight without any regard to accuracy. As such, the criticisms of the betas offered by S&P apply to both Bloomberg betas and *Value Line* betas.

<sup>24/</sup> Kroll, and its predecessor Duff & Phelps, is a provider of economic, financial, and valuation data that is often relied on by finance professionals and cited in ROR testimony.

<sup>25/</sup> Kroll, *Kroll Increases U.S. Normalized Risk-Free Rate from 3.0% to 3.5%, but Spot 20-Year U.S. Treasury Yield Preferred When Higher*, June 16, 2022. The current 20-year yield of 3.88% exceeds the “normalized” yield of 3.5%. In accordance with Kroll's prescribed method, the greater of the two shall be used, i.e., 3.88%.

1 market return over the period 1926 to 2022 to be 8.90%.<sup>26</sup> A current consensus for  
2 projected inflation, as measured by the Consumer Price Index (“CPI”), is 2.30%.<sup>27</sup> Using  
3 these estimates, the expected market return is 11.40%.<sup>28</sup> The market risk premium then is  
4 the difference between the 11.40% expected market return and the projected risk-free rate  
5 of 3.70%, or 7.70%.

6 **Q. PLEASE DESCRIBE YOUR MARKET RISK PREMIUM ESTIMATES**  
7 **DERIVED USING THE DCF METHODOLOGY.**

8 **A.** I employed two versions of the constant growth DCF model to develop estimates of the  
9 market risk premium. I first employed the Federal Energy Regulatory Commission’s  
10 (“FERC”) method of estimating the expected return on the market that was established in  
11 its Opinion No. 569-A. FERC’s method for estimating the expected return on the market  
12 is to perform a constant growth DCF analysis on each of the dividend paying companies  
13 of the S&P 500 index. The growth rate component is based on the average of the growth  
14 projections excluding companies with growth rates that were negative or greater than  
15 20%.<sup>29</sup> The weighted average growth rate for the remaining companies is 8.70%. After  
16 reflecting the FERC prescribed method of adjusting the dividend yield by  $(1 + 0.5g)$ , the  
17 weighted average expected dividend yield is 1.98%. Thus, the DCF-derived expected  
18 return on the market is the sum of those two components, or 10.68%. The market risk  
19 premium then is the expected market return of 10.68% less the projected risk-free rate of  
20 3.70%, or 7.00%.

21 My second DCF-based market risk premium estimate was derived by performing  
22 the same DCF analysis described above, except I used all companies in the S&P

---

<sup>26/</sup> Kroll, 2023 SBBI Yearbook at 138.

<sup>27/</sup> Blue Chip Financial Forecast May 1, 2023.

<sup>28/</sup>  $[(1 + 8.90\%) * (1 + 2.30\%) - 1] * 100$ .

<sup>29/</sup> Opinion No. 569-A, at p. 210.

1 500 index rather than just the dividend paying companies. The weighted average growth  
2 rate for these companies is 10.10%. After reflecting the FERC prescribed method of  
3 adjusting the dividend yield by  $(1 + 0.5g)$ , the weighted average expected dividend yield  
4 is 1.58%. Thus, the DCF-derived expected return on the market is the sum of those two  
5 components, or 11.68%. The market risk premium then is the expected market return of  
6 11.68% less the projected risk-free rate of 3.70%, or 8.00%.

7 The average expected market return based on the DCF model is 11.18% and the  
8 average market risk premium based on the two DCF estimates is 7.50%.

9 **Q. HOW DO YOUR EXPECTED MARKET RETURNS COMPARE TO CURRENT**  
10 **EXPECTATIONS OF FINANCIAL INSTITUTIONS?**

11 **A.** As shown in Table CCW-10, my average expected market return of 10.82%<sup>30</sup> exceeds  
12 long-term market expectations of several financial institutions.

---

<sup>30/</sup>  $10.82\% = (9.88\% + 11.18\% + 11.40\%) / 3.$

**TABLE CCW-10**

**Long-Term Expected Return on the Market**

<u>Source</u>	<u>Term</u>	<u>Expected Return Large Cap Equities</u>
BlackRock Capital Management <sup>1</sup>	30 Years	8.20%
JP Morgan Chase <sup>2</sup>	10 - 15 Years	7.90%
Vanguard <sup>3</sup>	10 Years	4.7% - 6.7%
Research Affiliates <sup>4</sup>	10 Years	5.80%

Sources:

<sup>1</sup>BlackRock Investment Institute, September 2022 report.

<sup>2</sup>JP Morgan Chase, Long-Term Capital Market Assumptions, 2023 Report.

<sup>3</sup>Vanguard economic and market outlook for 2023: Beating back inflation.

<sup>4</sup>Research Affiliates, Asset Allocation Interactive. Retrieved 12/31/2022.

1           When compared to the expected market returns of financial institutions above, my  
2           average expected market return of 10.82% is than all of them. For these reasons, my  
3           expected market returns, and the associated market risk premiums, should be considered  
4           reasonable, if not high-end estimates.

5 **Q.   HOW DO YOUR ESTIMATED MARKET RISK PREMIUMS COMPARE TO**  
6 **THAT ESTIMATED BY KROLL?**

7 **A.**   The Kroll analysis indicates a market risk premium falls somewhere in the range of  
8       6.00% to 7.17%. My market risk premium estimates are in the range of 6.00% to 7.70%.

9 **Q.   HOW DOES KROLL MEASURE A MARKET RISK PREMIUM?**

10 **A.**   Kroll's range is based on several methodologies. First, Kroll estimated a market risk

1 premium of 7.17% based on the difference between the total market return on common  
2 stocks (S&P 500) less the income return on 20-year Treasury bond investments over the  
3 1926-2022 period.<sup>31</sup>

4 Second, Kroll used the Ibbotson & Chen supply-side model which produced a  
5 market risk premium estimate of 6.35%.<sup>32</sup> Kroll explains that the historical market risk  
6 premium based on the S&P 500 was influenced by an abnormal expansion of P/E ratios  
7 relative to earnings and dividend growth. In order to control for the volatility of  
8 extraordinary events and their impacts on P/E ratios, Kroll takes into consideration the  
9 three-year average P/E ratio as the current P/E ratio. Therefore, Kroll adjusted this  
10 market risk premium estimate to normalize the growth in the P/E ratio to be more in line  
11 with the growth in dividends and earnings.

12 Finally, Kroll develops its own recommended equity, or market risk premium, by  
13 employing an analysis that takes into consideration a wide range of economic  
14 information, multiple risk premium estimation methodologies, and the current state of the  
15 economy by observing measures such as the level of stock indices and corporate spreads  
16 as indicators of perceived risk. Based on this methodology, and utilizing a “normalized”  
17 risk-free rate of 3.88%, Kroll concludes that the current expected, or forward-looking,  
18 market risk premium is 6.00%, implying an expected return on the market of 9.88%.<sup>33</sup>

19 **Q. WHAT ARE THE RESULTS OF YOUR CAPM ANALYSIS?**

20 **A.** As shown in AWEC-CUB/116, I have provided the results of nine different applications  
21 of the CAPM. The first three results presented are based on the proxy group’s current

---

<sup>31/</sup> Kroll, 2023 SBBI Yearbook at 191.

<sup>32/</sup> *Id.* at 199.

<sup>33/</sup> Kroll, *Kroll Increases U.S. Normalized Risk-Free Rate from 3.0% to 3.5%, but Spot 20- Year U.S. Treasury Yield Preferred When Higher*, June 16, 2022.

1 average *Value Line* beta of 0.89. The results of the CAPM based on these inputs range  
2 from 9.23% to 10.57%.

3 The next set of three results presented are based on the proxy group’s historical  
4 *Value Line* beta of 0.76. The results of the CAPM based on these inputs range from  
5 8.46% to 9.57%.

6 The last set of three results presented are based on the proxy group’s current S&P  
7 Global Market Intelligence beta of 0.83. The results of the CAPM based on these inputs  
8 range from 8.84% to 10.06%. My CAPM results are summarized in Table CCW-11.

<b>TABLE CCW-11</b>			
<b><u>CAPM Results Summary</u></b>			
<b><u>Description</u></b>	<b><u>Current VL Beta</u></b>	<b><u>Historical VL Beta</u></b>	<b><u>Current MI Beta</u></b>
D&P Normalized Method	9.23%	8.46%	8.84%
Risk Premium Method	10.57%	9.57%	10.06%
FERC DCF	10.39%	9.42%	9.89%

9 **Q. WHAT IS YOUR RECOMMENDED RETURN FOR THE COMPANY BASED**  
10 **ON YOUR CAPM?**

11 **A.** Based on the results summarized above, I recommend a CAPM return estimate of 9.50%.

12 **I. Return on Equity Summary**

13 **Q. BASED ON THE RESULTS OF YOUR RETURN ON COMMON EQUITY**  
14 **ANALYSES DESCRIBED ABOVE, WHAT RETURN ON COMMON EQUITY**  
15 **DO YOU RECOMMEND FOR THE COMPANY?**

16 **A.** The results of my analyses are summarized in Table CCW-12.





1 **Q. PLEASE DESCRIBE DR. VILLADSEN’S METHODOLOGY SUPPORTING HER**  
2 **ROE RECOMMENDATION.**

3 **A.** Dr. Villadsen arrived at her estimate using several models that she applied to a sample  
4 group of electric utility companies including a traditional CAPM and an empirical CAPM  
5 (“ECAPM”), a simple DCF, and a multi-stage growth DCF. Additionally, Dr. Villadsen  
6 performed a risk premium model.

7 **Q. IS DR. VILLADSEN’S ESTIMATED ROE FOR PGE REASONABLE?**

8 **A.** No. Dr. Villadsen’s recommended ROE of 9.80% for PGE is excessive and unreasonable  
9 for a low-risk regulated utility company. While 9.8% is within my recommended range,  
10 it is at the high-end. As I have described above, and later in this testimony, the evidence  
11 suggests that PGE is of lower risk than the proxy group companies, meaning an ROE in  
12 the lower half of the range would be warranted. Further, Dr. Villadsen asserts that PGE’s  
13 risk is higher than average relative to her electric sample.<sup>35</sup> The unreasonableness of Dr.  
14 Villadsen’s recommendation is evident from a detailed assessment of the rate of return  
15 models supporting her recommendation in this proceeding.

16 **Q. PLEASE SUMMARIZE DR. VILLADSEN’S ROE STUDY RESULTS.**

17 **A.** Dr. Villadsen’s ROE study results for her electric sample are summarized in Table CCW-  
18 13 below.<sup>36</sup> As I explain later, the table below clearly demonstrates that, even when her  
19 financial leverage adjustments are included, her recommended range and point estimate  
20 are unsupported.

---

<sup>35/</sup> *Id.*

<sup>36/</sup> See generally, PGE/1005.

**TABLE CCW-13**

**Summary of Dr. Villadsen's Electric Sample Results**

<u>Model</u>	<u>Dr. Villadsen's Results</u>			<u>Corrected ROE</u>
	<u>Model Results</u>	<u>ATWACC Adjustment</u>	<u>Recommended ROE</u>	
	(1)	(2)	(3)	(4)
<u>DCF (Electric Sample)</u>				
Simple DCF	10.1%	0.4%	10.5%	9.9%
Multi-Stage	8.3%	0.5%	<u>8.8%</u>	<u>8.4%</u>
Average DCF			9.7%	<b>9.15%</b>
<u>CAPM (Electric Sample)</u>				
Traditional CAPM	8.0% - 10.6%	0.6%-1.1%	8.6% - 11.7%	9.7%
ECAPM (1.5%)	8.2% - 10.8%	0.7%-1.1%	8.9% - 11.9%	Reject
Traditional CAPM (Hamada)			8.4% - 11.5%	Reject
ECAPM (1.5%) (Hamada)			8.5% - 11.5%	Reject
Risk Premium (Electric)			10.4%	9.95%
Range of Electric Results	8.0% - 10.8%		8.4% - 11.9%	9.15% - 9.95%
Recommended Range			9.7% - 10.4%	
Recommended ROE			9.80%	9.50%
ROE = Return on Equity				
ATWACC = After-Tax Weighted Average Cost of Capital				

1 As shown in Table CCW-13 above, the model ROE results of Dr. Villadsen's  
2 studies applied to her electric sample indicate that the required ROE is in the range of  
3 8.3% to 10.6%. She then increases her market ROE estimate by adjusting her results  
4 upward in the range of 0.4% to 1.1% using an overall cost of capital ("OCC")  
5 methodology. Dr. Villadsen describes the OCC methodology at pages 12-14 of  
6 Appendix B to her testimony. The OCC method employed by Dr. Villadsen is identical

1 to the After-Tax Weighted Average Cost of Capital (“ATWACC”) methodology  
2 previously rejected by other Regulatory Commissions in previous cases.<sup>37</sup> This  
3 ATWACC adjustment increases her recommended range up to 9.70% to 10.40%. Dr.  
4 Villadsen asserts this ATWACC adjustment is necessary to properly recognize the  
5 difference of PGE’s financial risk when applying a market ROE to its book value  
6 common equity.

7 **Q. DO DR. VILLADSEN’S ROE MODEL RESULTS SUPPORT THE COMPANY’S**  
8 **REQUESTED ROE OF 9.80%, OR EVEN THE ROE RANGE SHE**  
9 **RECOMMENDS?**

10 **A.** No. As described below and illustrated in Table CCW-13 above, Dr. Villadsen’s own  
11 studies, with reasonable adjustments, would support an ROE in the range of 9.15% to  
12 9.95%, with a midpoint of 9.55%. While 9.8% is within my recommended range, it is at  
13 the high-end. As I have described above, and later in this testimony, the evidence  
14 suggests that PGE is of lower risk than the proxy group companies, meaning an ROE in  
15 the lower half of the range would be warranted.

16 **Q. PLEASE DESCRIBE THE ISSUES YOU HAVE WITH DR. VILLADSEN’S**  
17 **ANALYSES.**

18 **A.** The issues and concerns I have with Dr. Villadsen’s analyses in support of the  
19 Company’s requested ROE include the following:

- 20 1. Her ATWACC adjustment is unnecessary and does not have wide regulatory  
21 acceptance.
- 22 2. The upper-end of her recommended range and her recommended point estimate rests  
23 solely on the inclusion of her unaccepted financial leverage adjustments.
- 24 3. Dr. Villadsen inappropriately excluded outlier results. Rather, Dr. Villadsen should  
25 have measured the proxy group’s median results to mitigate the effect of outliers.

---

<sup>37/</sup> See U-18014 Order at page 66, and U-18255 Order at page 32. Throughout my response to Dr. Villadsen’s testimony, I will use OCC and ATWACC interchangeably.

- 1 4. For her CAPM analysis, she includes both an ATWACC adjustment, and  
2 alternatively a leveraged beta adjustment to the CAPM results.
- 3 5. Her projected risk-free rate of 4.05% is excessive and not reflective of current interest  
4 rate projections.
- 5 6. Her Value Line betas are based on five years of historical stock prices and are  
6 significantly being impacted by the spike in volatility as a result of the pandemic and  
7 its impact on the market in early 2020. She failed to consider a more normalized  
8 estimate of beta.
- 9 7. She also relies on an ECAPM analysis and includes adjustments for her ATWACC  
10 and leveraged beta methods. In addition to my concerns for these two adjustments,  
11 Dr. Villadsen's ECAPM analysis is miscalculated because she uses adjusted betas  
12 within an ECAPM format. This is inappropriate because an adjusted beta  
13 accomplishes the same thing as an ECAPM analysis. Both levelize the security  
14 market line in measuring a fair ROE based on a given level of systematic risk or beta  
15 risk. Her ECAPM analysis double counts the increase in the CAPM return estimates  
16 for companies with betas less than 1, which reflects her proxy group and PGE in this  
17 case.
- 18 8. Dr. Villadsen's assertion that PGE is of higher risk than her sample companies is  
19 incomplete, inaccurate, and should be ignored.

20 **B. ATWACC**

21 **Q. PLEASE DESCRIBE DR. VILLADSEN'S PROPOSED ATWACC ROE**  
22 **ADJUSTMENT.**

23 **A.** Dr. Villadsen calculates an ATWACC for each of her sample DCF and CAPM results by  
24 using each sample company's market value capital structure and assumes cost rates for  
25 the cost of debt and preferred stock based on each company's credit rating. She also  
26 assumes PGE's composite tax rate of 27.0% is applicable to all companies in her sample.  
27 Once she calculates the OCC or ATWACC, she then backs into the ROE required to  
28 produce the same rate of return using PGE's book value capital structure and embedded  
29 cost of debt.

30 These ATWACC adjustments to her ROE estimates are discussed in her  
31 Appendix B and developed in the workpapers accompanying her schedules for the

1 CAPM and DCF return estimates.

2 **Q. DO YOU BELIEVE THAT THE ATWACC METHODOLOGY IS REASONABLE**  
3 **POLICY FOR SETTING AN APPROVED ROE IN THE UNITED STATES?**

4 **A.** No. The ATWACC methodology is poor regulatory policy and should be rejected for  
5 several reasons:

6 1. It does not produce clear and transparent objectives for management to use that  
7 will accomplish the objective of minimizing its overall rate of return while  
8 preserving its financial integrity. It ignores a utility's need for capital discipline,  
9 treating it as it would an unregulated utility affiliate. Therefore, a regulatory  
10 commission cannot oversee the reasonableness and prudence of management  
11 decisions in managing its capital structure. Under the ATWACC theory,  
12 management's decisions to manage its capital structure can be skewed by changes  
13 in market value which change the market value capitalization mix. Management  
14 simply has no control over the market value capital structure, but it does have  
15 control over the book value capital structure. As such, setting the rate of return  
16 and measuring risk based on book value capital structure creates a more  
17 transparent and clear path for regulatory oversight of management's effort to  
18 maintain a balanced and reasonable capital structure.

19 2. The ATWACC introduces significant additional instability and unreliability into  
20 the utility's cost of service and tariff rates. Book value capital structure weights  
21 permit the utility to hedge or lock-in a large portion of capital market costs in  
22 arriving at the rate of return used to set rates. This rate of return cost hedge  
23 stabilizes the utility's cost of service, which in turn helps stabilize utility rates. A  
24 stable method of setting rates also allows investors to more accurately assess the  
25 future earnings and cash flow outlooks for the utility, which will reduce the  
26 business risk of the utility. The ATWACC, on the other hand, will produce an  
27 overall rate of return which will change based on both changes to market value  
28 capital structure weights and also based on changes to market capital costs.  
29 Hence, a major component of the cost structure of the utility (i.e., the overall rate  
30 of return) will vary based on market forces from rate case to rate case. This rate  
31 of return variability will introduce significant instability in the utility's cost of  
32 service (via rate of return changes) and hence instability in tariff rates.  
33 Introducing additional instability and unreliability in the utility's cost structure  
34 and rates will not benefit either investors or ratepayers.

35 3. The ATWACC artificially increases rates to produce an excessive ROE  
36 opportunity for utility investors, as if the utility were an unregulated affiliate.  
37 Inflating utility's rates to provide this excessive earnings opportunity is unjust and  
38 unreasonable to ratepayers and should be rejected.

1 **Q. HAS THE ATWACC METHODOLOGY PROPOSED BY DR. VILLADSEN**  
2 **GENERALLY BEEN ACCEPTED IN RATE-SETTING PROCEEDINGS IN THE**  
3 **UNITED STATES?**

4 **A.** No. The use of this methodology is not widely accepted by the regulatory commissions.

5 Specifically, the Michigan Public Service Commission has rejected Dr.  
6 Villadsen's application of the ATWACC methodology in U-18014, stating: "[...] the  
7 Commission does agree with the PFD that little or no weight should be given to the  
8 utility's ATWACC calculations."<sup>38</sup>

9 More recently, the Michigan Public Utility Commission reaffirmed its decision in  
10 DTE rate case (U-18255).<sup>39</sup>

11 In a recent Nicor Gas rate case (Docket No. 21-0098), the Illinois Commerce  
12 Commission explicitly rejected the application of any leverage ROE adjustments, stating  
13 the following in regard to Dr. Villadsen's leverage adjustments:

14 Additionally, the Company's leverage adjustments improperly inflated the  
15 Company's ROE recommendation, especially for the water companies.  
16 Further, the leverage adjustments are based on the flawed argument that a  
17 market-derived ROE does not produce a fair rate of return when applied to a  
18 book value rate base. In the Commission's view, an ROE derived from  
19 market-based models should be applied to the book value common equity  
20 ratio of the Illinois utility because the book value capital structure reflects the  
21 amount of capital a utility actually uses to finance the acquisition of assets for  
22 providing utility service, which are included in rate base. In contrast, market  
23 value typically includes appreciated value, which is not used in establishing  
24 the overall or weighted average cost of capital in ratemaking proceedings for  
25 Illinois utilities. The Commission has used this approach to establish utility  
26 rates for decades and the results have consistently provided Illinois utilities  
27 with adequate access to capital at reasonable costs. In contrast, allowing  
28 upward adjustments to the allowed ROE to reflect leverage adjustments  
29 would result in a never-ending upward movement in the allowed rate of  
30 return, which would not properly balance the interests of customers and the  
31 utility.

---

<sup>38/</sup> Michigan Public Service Commission, Case No. U-18014, Final Order, page 66, January 31, 2017.

<sup>39/</sup> Michigan Public Service Commission, Case No. U-18255, Final Order, page 32, April 18, 2018.

1 \* \* \*

2 The Commission concludes that the Company's ROE recommendations  
3 should not be adopted primarily because the Company's DCF and CAPM  
4 estimates include leverage adjustments, which the Commission has routinely  
5 rejected.<sup>40</sup>

6 Therefore, the ATWACC methodology is a flawed approach that is not supported  
7 by regulatory commissions and should be rejected.

8 ***C. Dr. Villadsen's DCF Analysis***

9 **Q. PLEASE DESCRIBE DR. VILLADSEN'S DCF ANALYSIS.**

10 **A.** Dr. Villadsen develops two versions of the DCF model, a quarterly constant growth DCF  
11 and a multi-stage DCF. Her constant growth DCF model for her electric group is based  
12 on an average growth rate of 5.7% and produces an average of 10.1% for the electric  
13 sample after she excludes what she has determined to be low-end outliers. Her multi-  
14 stage DCF method is similar to mine and assumes a terminal growth rate of 3.9% based  
15 on the projected growth of the US economy. Her average multi-stage DCF result is 8.3%  
16 for her electric sample.

17 **Q. WHAT CONCERNS DO YOU HAVE WITH DR. VILLADSEN'S DCF**  
18 **ANALYSIS?**

19 **A.** In addition to the inclusion of her financial leverage adjustments, my concern is that Dr.  
20 Villadsen failed to measure the proxy group median results instead of removing the  
21 results she deemed to be too low for consideration. The median result of her constant  
22 growth DCF is 9.9% and the median of her multi-stage DCF is 8.4%. The midpoint of  
23 these estimates is 9.15%.

---

<sup>40/</sup> Illinois Commerce Commission, Docket No. 21-0098, *Northern Illinois Gas Company d/b/a Nicor Gas Company*, Final Order at 93-94, November 18, 2021.

1 **D. Dr. Villadsen's CAPM Analysis**

2 **Q. PLEASE DESCRIBE DR. VILLADSEN'S CAPM ANALYSIS.**

3 **A.** Dr. Villadsen develops two versions of the CAPM model, a traditional CAPM and an  
4 ECAPM. In her analyses, Dr. Villadsen relied upon two different scenarios. In the first  
5 scenario, she used a projected risk-free rate of 4.05% with a market risk premium of  
6 7.46%. In this scenario, Dr. Villadsen's risk-free rate is based on the projected 10-year  
7 Treasury yield of 3.55%, plus an adjustment for term to maturity of 0.50%, for a  
8 projected 20-year risk-free rate of 4.05%. The unadjusted average result of her Scenario  
9 1 CAPM analysis is 10.6%.<sup>41</sup>

10 In the Scenario 2 analysis, she used the same forecasted yield of 4.05% and a  
11 market risk premium of 4.50%. Applying these inputs with her *Value Line* betas, she  
12 produces her bare-bones CAPM estimates 8.0% for her electric sample.<sup>42</sup>

13 To these bare bones CAPM returns, Dr. Villadsen proposes either one of two  
14 ROE adjustments. First, she proposes to add to her base CAPM return estimate an  
15 ATWACC ROE adjustment of approximately 60-110 basis points. This produces an  
16 ATWACC-adjusted CAPM return for her electric sample in the range of 8.6% to  
17 11.9%.<sup>43</sup> For the reasons outlined above, this ATWACC adjustment should be rejected.

18 Alternatively, Dr. Villadsen proposes a financial risk adjustment known as the  
19 Hamada adjustment. This leveraged beta adjustment adds approximately 40 to 90 basis  
20 points to the base CAPM return estimates.<sup>44</sup> The Hamada adjustment proposed by Dr.  
21 Villadsen produces adjusted CAPM return estimates of 8.4% to 11.5%.

---

<sup>41</sup> PGE/1005 at 37.

<sup>42</sup> PGE/1005 at 38.

<sup>43</sup> PGE/1005 at 41.

<sup>44</sup> PGE/1005 at 44-45.



1 **Q. WHAT CONCERNS DO YOU HAVE WITH DR. VILLADSEN'S CAPM**  
2 **ANALYSIS?**

3 **A.** In addition to her various leverage adjustments, my concerns are that her average Value  
4 Line beta of 0.884 is still being impacted by the market fallout caused the pandemic in  
5 early 2020 and not reflective of current investor expectations, and her projected 20-year  
6 Treasury yield of 4.05% is significantly overstated.

7 **Q. WHAT CONCERNS DO YOU HAVE WITH DR. VILLADSEN'S VALUE LINE**  
8 **BETA ESTIMATES?**

9 **A.** As I explain above in regard to my own CAPM analysis, current Value Line these beta  
10 estimates are abnormally high and are unlikely to be sustained over the long-term. As  
11 such, I believe it to be reasonable to consider the historical average of the proxy group's  
12 *Value Line* betas. The historical average *Value Line* beta since 2014 is 0.76 and has  
13 ranged from 0.57 to 0.91. Prior to the recent pandemic, the high end of this range was  
14 0.75. As such, I believe a more reasonable approach would include a CAPM analysis  
15 assuming a long-term average beta of 0.76.

16 **Q. WHAT CONCERNS DO YOU HAVE WITH DR. VILLADSEN'S PROJECTED**  
17 **TREASURY YIELD OF 4.05%?**

18 **A.** As I describe above, Dr. Villadsen's projected risk free rate of 4.05% is based on a  
19 projected 10-year Treasury yield of 3.55% plus a 0.50% spread to account for the  
20 differences between the 20-year yield over the 10-year yield. More recent projections for  
21 the 10-year Treasury yield are 3.4%. Importantly, the projected 30-year Treasury yield is  
22 3.7%. In other words, Dr. Villadsen assumes that the 20-year yield will exceed the  
23 30-year yield by 35 basis points. Such an assumption is unreasonable and should be  
24 rejected. A more reasonable estimate of the projected 20-year Treasury yield would be  
25 somewhere between the projected yields for the 10-year Treasury (3.4%) and the 30-year

1 Treasury (3.7%). The midpoint of these projections is 3.55%.

2 **Q. WHAT WOULD DR. VILLADSEN'S CAPM RESULTS BE AFTER**  
3 **ACCOUNTING FOR THESE CHANGES?**

4 **A.** Simply using a more reasonable projection of the 20-year Treasury yield of 3.55%  
5 instead of her inflated 4.05% estimate would lower her Scenario 1 CAPM results from  
6 10.6% to 10.14%. Incorporating the more reasonable projection of the 20-year Treasury  
7 yield of 3.55% and the historical average *Value Line* beta of 0.76 would produce CAPM  
8 results of 9.22%. The midpoint of these two corrected estimates is approximately 9.7%

9 **Q. PLEASE EXPLAIN DR. VILLADSEN'S LEVERAGED BETA ADJUSTMENT.**

10 **A.** As an alternative to her ATWACC adjustment to her CAPM results, Dr. Villadsen  
11 measures an additional ROE adjustment based on leveraged adjustments to the beta  
12 component of the CAPM study. In producing this adjustment, she applies the Hamada  
13 method to de-lever and re-lever the beta component in both the CAPM and the ECAPM  
14 with and without the effect of income taxes.<sup>45</sup>

15 Applying the Hamada formula increases the electric sample *Value Line* beta from  
16 0.88 to 0.99 (without taxes) and 0.97 (with taxes) for the electric sample.<sup>46</sup> The Hamada  
17 model produces CAPM results in the range of 8.4% to 11.5% and ECAPM results in the  
18 range of 8.5% to 11.5% for the electric sample.<sup>47</sup>

19 **Q. IS DR. VILLADSEN'S APPLICATION OF THE LEVERAGED BETA**  
20 **ADJUSTMENT REASONABLE?**

21 **A.** No. As described above, Dr. Villadsen's financial leverage adjustments are generally not  
22 accepted in establishing a fair ROE in regulated rate-setting proceedings such as this one.

---

<sup>45</sup>/ PGE/1000 at Technical Appendix PGE/1004.

<sup>46</sup>/ PGE/1000 at \_\_\_.

<sup>47</sup>/ *Id.*

1 **Q. DO YOU HAVE ANY CONCERNS WITH DR. VILLADSEN’S ECAPM RETURN**  
2 **ESTIMATES?**

3 **A.** Yes. I also have concerns with Dr. Villadsen’s reliance on her ECAPM return estimates.  
4 Specifically, Dr. Villadsen included an adjusted beta within her ECAPM studies.<sup>48</sup> This  
5 adjustment is inconsistent with the academic research supporting the development of an  
6 ECAPM methodology.<sup>49</sup> Bottom line, using adjusted betas within an ECAPM study  
7 double counts the purpose of the ECAPM study – that is, to flatten the security market  
8 line and increase a CAPM return estimate for companies with betas less than 1, and  
9 decrease the CAPM return estimate for betas greater than 1.

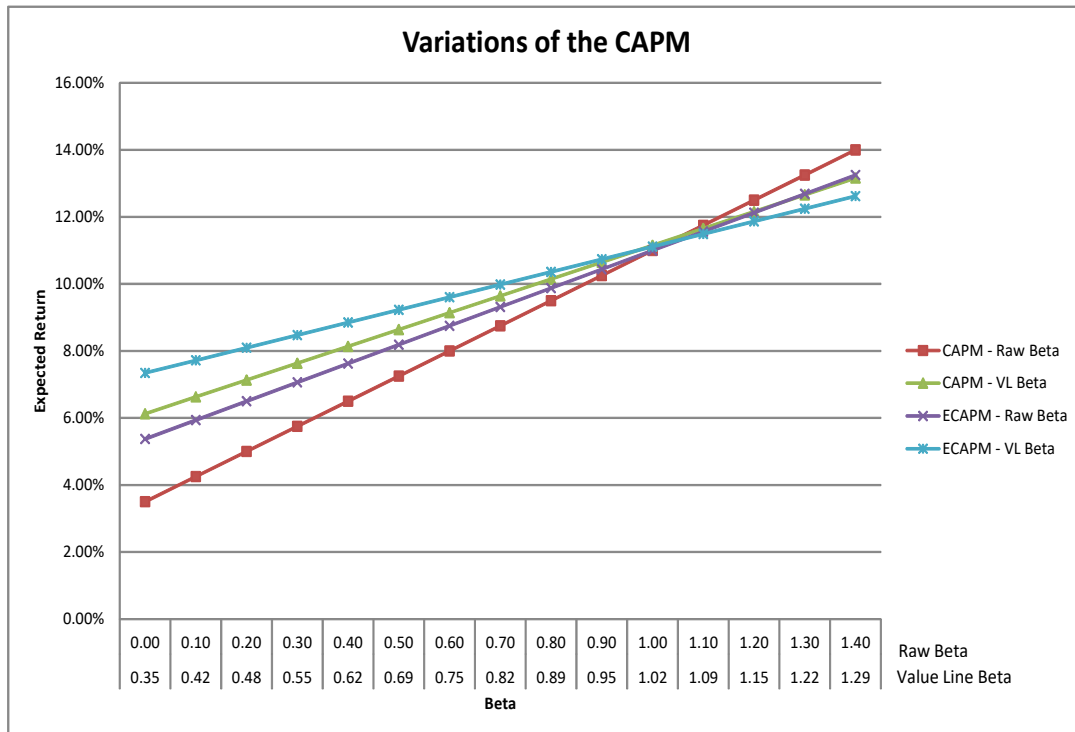
10 The ECAPM will raise the intercept point of the security market line and flatten  
11 the slope which has the effect of increasing CAPM return estimates for companies with  
12 betas less than 1, and decreasing the CAPM return estimates for companies with betas  
13 greater than 1. Importantly, however, the use of an adjusted beta such as those published  
14 by *Value Line*, produces comparable adjustments to the security market line and CAPM  
15 return estimate. In effect, using an adjusted beta within an ECAPM study has the effect  
16 of a double adjustment to the slope and intercept of the security market line. This is  
17 illustrated in my Figure CCW-5 below.

---

<sup>48/</sup> PGE/1000 at \_\_\_.

<sup>49/</sup> See Black, Fischer, “Beta and Return,” *The Journal of Portfolio Management*, Fall 1993, 8-18; and Black, Fischer, Michael C. Jensen and Myron Scholes, “The Capital Asset Pricing Model: Some Empirical Tests,” 1972.

FIGURE CCW-5



Assumptions:  
Market Risk Premium is 7.50%  
Risk-Free Rate is 3.50%

1 As shown in Figure CCW-5 above, the CAPM using a *Value Line* beta, versus a  
 2 CAPM using a raw beta shows that the *Value Line* beta raises the intercept slope and  
 3 flattens the security market line. Further, the ECAPM using a raw beta, and an ECAPM  
 4 using a *Value Line* beta, have a magnified effect of increasing the intercept slope and  
 5 further flattening the security market line.

6 There is simply no legitimate basis to use an adjusted beta within an ECAPM  
 7 because they are designed to produce the same effect on the CAPM return estimate.

8 ***E. Dr. Villadsen's Risk Premium Analysis***

9 **Q. PLEASE DESCRIBE DR. VILLADSEN'S RISK PREMIUM ANALYSES.**

10 **A.** Dr. Villadsen's risk premium analyses are predicated on an inverse relationship between  
 11 authorized ROEs for vertically integrated electric utilities and long-term Treasury yields

1 during the period 1990 through Q3 2022 using a regression analysis.<sup>50</sup> In her analysis,  
2 she uses the resulting regression formula to predict a risk premium based on the same  
3 forecasted long-term Treasury yield of 4.05% she used in her CAPM analyses and  
4 electric utility ROE decisions. This regression formula and her forecasted Treasury yield  
5 of 4.05% produced an estimated risk premium of approximately 6.3%, which resulted in  
6 a ROE of 10.4%.<sup>51</sup>

7 **Q. DO YOU HAVE ANY OBSERVATIONS REGARDING DR. VILLADSEN'S RISK**  
8 **PREMIUM ANALYSIS THAT YOU WOULD LIKE TO POINT OUT?**

9 **A.** I believe her projected risk-free rate and projected risk premium are both too high. As I  
10 describe above, Dr. Villadsen's projected risk free rate of 4.05% is based on a projected  
11 10-year Treasury yield of 3.55% plus a 0.50% spread to account for the differences  
12 between the 20-year yield over the 10-year yield. More recent projections for the 10-year  
13 Treasury yield are 3.4%. Importantly, the projected 30-year Treasury yield is 3.7%. In  
14 other words, Dr. Villadsen assumes that the 20-year yield will exceed the 30-year yield  
15 by 35 basis points. Such an assumption is unreasonable and should be rejected. A more  
16 reasonable estimate of the projected 20-year Treasury yield would be somewhere  
17 between the projection yields for the 10-year Treasury (3.4%) and the 30-year Treasury  
18 (3.7%).

19 While I generally disagree with the use of a simple regression analysis to estimate  
20 the risk premium, simply using a more reasonable estimate of the projected 20-year yield  
21 would produce a more reasonable result. Assuming a 20-year yield of 3.55%, which is  
22 the midpoint of the projections for the 10-year Treasury (3.4%) and the 30-year Treasury  
23 (3.7%) yields, her regression model would produce an ROE estimate of 10.16%, which

---

<sup>50/</sup> PGE/1000 at 65.

<sup>51/</sup> *Id.* at 66.

1 compares to her risk premium recommendation of 10.4%. As I explain above in regard  
2 to my own risk premium analysis, I believe the ROE estimate for the risk premium  
3 method using 30-year Treasury yields is 9.74%. The midpoint of 10.16% and 9.74% is  
4 9.95%.

5 ***F. Response to Dr. Villadsen’s Conclusion that PGE is of Higher Risk***

6 **Q. DID DR. VILLADSEN OFFER AN ASSESSMENT OF PGE’S RISK RELATIVE**  
7 **TO HER ELECTRIC SAMPLE?**

8 **A.** Yes. Beginning on page 68 of her testimony, Dr. Villadsen offers a few examples of why  
9 she believes PGE is of higher business risk relative to her sample companies.  
10 Dr. Villadsen’s examples including the asymmetric deadband in the power cost  
11 adjustment mechanism, PGE’s ROE deadband of +/- 100 basis points, the Company’s  
12 concentrated geographic location, PGE’s smaller size relative to the average electric  
13 utility, and increase in deferred costs are why she concludes that PGE is of higher than  
14 average risk when compared to the sample, although Dr. Villadsen points out that PGE’s  
15 S&P rating of BBB+ “is comparable to that of the sample”.<sup>52</sup>

16 **Q. DO YOU BELIEVE DR. VILLADSEN ACCURATELY ASSESSED THE RISK OF**  
17 **PGE RELATIVE TO THE SAMPLE?**

18 **A.** No. In short, Dr. Villadsen has cherry-picked risks potentially faced by PGE without  
19 considering other unique risks faced by the proxy group companies. Dr. Villadsen’s  
20 concerns about these particular risks should be ignored.

21 First, to the extent ratings agencies deemed these particular risks detrimental to  
22 PGE, ratings agencies would have taken them into consideration and they would be  
23 reflected in PGE’s credit ratings. As I discussed above in detail, and show on my  
24 AWEC-CUB/103, PGE’s ratings from both S&P and Moody’s are identical to, or higher

---

<sup>52/</sup> PGE/1000 at 68.

1 than those of the proxy group. S&P and other credit rating agencies go through great  
2 detail in assessing a utility's business risk and financial risk in order to evaluate their  
3 assessment of its total investment risk. If anything, PGE's total risk is less than that of  
4 the proxy group, not more. Dr. Villadsen's argument in that PGE is of higher risk is  
5 misleading and should be ignored.

6 Second, as I described above concerning the CAPM, investors are not  
7 compensated for taking on company-specific risks, as those risks can be eliminated  
8 through portfolio diversification. Institutional investors are the largest holders of utility  
9 stocks in general. Examples of institutional investors include, but are not limited to,  
10 pension funds, endowments, and mutual funds. Even if one were to accept Dr.  
11 Villadsen's misleading assertion that PGE is of higher risk, to suggest these investors are  
12 not well-diversified and somehow need to be compensated for taking on  
13 company-specific risks would be in error and violate the CAPM.

14 Based on the above, Dr. Villadsen's conclusion that PGE is of higher risk relative  
15 to her sample companies is unfounded and should be rejected.

16 **Q. DOES THIS CONCLUDE YOUR OPENING TESTIMONY?**

17 **A.** Yes, it does.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/101  
QUALIFICATIONS OF CHRISTOPHER C. WALTERS**



**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 an Associate with the firm of Brubaker & Associates, Inc. (“BAI”), energy,  
6 economic and regulatory consultants in the field of public utility regulation.

7 **Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND**  
8 **PROFESSIONAL EMPLOYMENT EXPERIENCE.**

9 **A.** I received a Bachelor of Science Degree in Business Economics and Finance from  
10 Southern Illinois University Edwardsville. I have also received a Master of Business  
11 Administration Degree from Lindenwood University.

12 As an Associate at BAI, I perform detailed technical analyses and research to  
13 support regulatory projects including expert testimony covering various regulatory  
14 issues. Since my career at BAI began in 2011, I have held the positions of Analyst,  
15 Associate Consultant, Consultant, Senior Consultant, and Associate. Throughout my  
16 tenure, I have been involved with several regulated projects for electric, natural gas  
17 and water and wastewater utilities, as well as competitive procurement of electric  
18 power and gas supply. My regulatory project work includes estimating the cost of  
19 equity capital, capital structure evaluations, assessing financial integrity, merger and  
20 acquisition related issues, risk management related issues, depreciation rate studies,  
21 and other revenue requirement issues.

1           BAI was formed in April 1995. BAI and its predecessor firm have participated  
2 in more than 700 regulatory proceedings in 40 states and Canada.

3           BAI provides consulting services in the economic, technical, accounting, and  
4 financial aspects of public utility rates and in the acquisition of utility and energy  
5 services through RFPs and negotiations, in both regulated and unregulated markets.  
6 Our clients include large industrial and institutional customers, some utilities and, on  
7 occasion, state regulatory agencies. We also prepare special studies and reports,  
8 forecasts, surveys and siting studies, and present seminars on utility-related issues.

9           In general, we are engaged in energy and regulatory consulting, economic  
10 analysis and contract negotiation. In addition to our main office in St. Louis, the firm  
11 also has branch offices in Corpus Christi, Texas; Detroit, Michigan; Louisville,  
12 Kentucky and Phoenix, Arizona.

13 **Q. HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?**

14 **A.** Yes. I have sponsored testimony before state regulatory commissions including:  
15 Arizona, Arkansas, Delaware, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana,  
16 Maryland, Michigan, Minnesota, Missouri, Nevada, New Mexico, Ohio, Oklahoma,  
17 Utah, and Wyoming. In addition, I have also sponsored testimony before the City  
18 Council of New Orleans and an affidavit before the FERC.

19 **Q. PLEASE DESCRIBE ANY PROFESSIONAL REGISTRATIONS OR**  
20 **ORGANIZATIONS TO WHICH YOU BELONG.**

21 **A.** I earned the Chartered Financial Analyst (“CFA”) designation from the CFA Institute.  
22 The CFA charter was awarded after successfully completing three examinations which  
23 covered the subject areas of financial accounting and reporting analysis, corporate

1 finance, economics, fixed income and equity valuation, derivatives, alternative  
2 investments, risk management, and professional and ethical conduct. I am a member  
3 of the CFA Institute and the CFA Society of St. Louis.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/102  
VALUATION METRICS**

Portland General Electric Company

Electric Utilities  
(Valuation Metrics)

Line	Company	Price to Earnings (P/E) Ratio <sup>1</sup>																					
		21-Year																					
		Average (1)	2022 <sup>2</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)	2005 (19)	2004 (20)	2003 (21)	2002 (22)
1	ALLETE	18.02	16.90	16.70	18.28	24.75	22.17	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	16.86	17.90	21.90	21.23	21.16	19.14	20.60	22.30	18.07	16.60	15.28	14.50	14.45	12.47	13.86	13.43	15.08	16.82	12.59	14.00	12.69	19.93
3	Ameren Corp.	16.65	18.70	21.10	22.23	22.09	18.29	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	15.06	17.80	17.90	19.57	21.41	18.04	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.	25.08	19.30	19.10	25.34	22.15	26.05	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.	18.46	17.30	22.30	21.18	14.98	24.54	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	17.88	17.60	20.00	17.00	21.18	16.82	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	16.76	19.20	26.60	15.92	19.45	36.99	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.	18.18	20.00	23.70	23.32	24.28	20.31	21.32	20.94	18.29	17.30	16.32	15.07	13.62	12.46	10.87	26.84	22.18	12.60	12.39	N/A	N/A	N/A
10	Consol. Edison	16.30	20.40	20.00	20.08	21.10	17.10	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	20.19	14.30	20.00	43.94	35.21	21.80	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	15.99	17.80	19.60	16.30	19.88	17.41	18.59	18.97	18.11	14.91	17.92	14.89	13.51	12.27	10.41	14.81	18.27	17.43	13.80	16.04	13.69	11.28
13	Duke Energy	17.71	17.50	20.90	22.40	17.71	19.41	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	15.29	15.90	15.60	34.93	16.66	N/A	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	17.68	N/A	N/A	N/A	N/A	26.85	21.78	18.66	18.33	16.38	15.88	14.47	12.60	10.72	10.79	11.89	15.26	16.92	22.03	18.26	22.99	N/A
16	Entergy Corp.	14.06	19.10	15.40	15.26	16.50	13.81	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	18.36	17.90	21.30	24.33	22.11	18.73	19.47	18.69	18.11	17.92	16.94	19.86	15.35	13.42	11.96	13.66	18.75	27.07	19.76	20.77	13.35	16.07
18	Evergy, Inc.	20.38	17.80	17.90	21.71	21.76	22.71	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.	15.25	18.00	20.70	15.39	15.75	20.09	13.41	18.68	12.58	16.02	13.43	19.08	11.30	10.97	11.49	17.97	18.22	16.53	15.37	12.99	11.77	10.46
20	FirstEnergy Corp.	18.11	15.30	17.90	20.24	23.78	26.47	11.41	15.91	17.02	39.79	13.06	21.10	22.39	11.75	13.02	15.64	15.59	14.23	16.07	14.13	22.47	12.95
21	Fortis Inc.	19.28	19.00	21.30	20.63	19.22	17.08	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	N/A	N/A	N/A	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.	18.45	17.20	20.70	21.48	21.27	18.95	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.	17.29	22.20	23.50	19.88	22.31	20.50	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	NextEra Energy, Inc.	18.74	24.40	32.50	31.75	26.79	24.80	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
26	NorthWestern Corp	17.24	17.50	18.70	19.49	19.89	16.77	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
27	OGE Energy	15.36	17.40	15.20	16.25	19.00	16.53	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
28	Otter Tail Corp.	23.03	16.90	13.80	18.31	23.51	22.25	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
29	Pinnacle West Capital	16.30	19.90	19.90	16.71	19.37	17.82	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
30	PNM Resources	18.56	18.80	20.20	20.79	21.08	23.39	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
31	Portland General	17.59	18.80	19.60	26.57	22.31	18.42	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
32	PPL Corp.	14.61	18.00	21.60	13.94	13.29	11.33	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
33	Public Serv. Enterprise	14.82	17.80	31.30	14.91	15.10	18.71	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
34	SCANA Corp.	13.96	N/A	N/A	N/A	N/A	N/A	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
35	Sempra Energy	15.92	17.40	20.10	19.62	22.50	20.40	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
36	Southern Co.	16.30	20.30	20.60	17.91	17.58	15.06	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
37	Vectren Corp.	17.05	N/A	N/A	N/A	N/A	N/A	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
38	WEC Energy Group	17.32	19.60	21.30	24.89	23.49	19.57	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
39	Westar Energy	15.58	N/A	N/A	N/A	N/A	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
40	Xcel Energy Inc.	18.02	21.20	23.90	23.88	22.34	18.93	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
41	Average	17.16	18.43	20.65	21.30	20.88	20.21	19.60	18.77	17.73	17.45	16.17	15.51	15.28	14.22	13.53	15.29	17.83	16.53	16.39	16.61	13.71	14.26
42	Median	16.20	17.90	20.20	20.24	21.18	19.14	19.97	18.80	17.69	16.54	16.20	14.99	14.25	12.82	12.70	14.34	16.41	15.97	15.92	15.29	13.60	13.38

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

## Portland General Electric Company

### Electric Utilities (Valuation Metrics)

#### Market Price to Cash Flow (MP/CF) Ratio <sup>1</sup>

Line	Company	20-Year																					
		Average (1)	2022 <sup>2a</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)	2005 (19)	2004 (20)	2003 (21)	2002 (22)
1	ALLETE	9.31	7.56	8.61	8.14	11.38	10.16	10.95	8.26	7.49	8.80	9.15	8.18	7.91	8.04	8.51	9.29	10.30	11.06	11.54	11.46	N/A	N/A
2	Alliant Energy	8.19	10.43	10.31	10.66	10.74	9.71	13.21	10.67	8.86	8.40	7.52	7.50	7.21	6.59	6.23	7.49	7.92	8.00	5.09	5.52	4.76	5.20
3	Ameren Corp.	7.38	9.54	9.03	9.63	9.45	7.95	8.38	7.44	6.87	6.95	6.61	5.48	5.02	4.23	4.25	6.35	7.69	8.57	8.57	8.24	6.74	7.96
4	American Electric Power	6.68	8.67	7.57	8.41	9.34	8.03	8.81	7.57	7.09	7.00	6.57	5.93	5.46	5.54	4.71	5.71	6.84	5.54	6.07	5.50	4.69	5.19
5	Avangrid, Inc.	9.83	8.69	11.19	9.39	9.11	10.24	10.14	8.56	11.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	6.98	9.39	8.03	7.80	7.34	10.14	9.35	7.63	6.76	7.30	6.21	6.88	6.40	5.80	4.06	5.12	7.58	5.30	6.58	7.58	5.36	5.90
7	Black Hills	7.92	8.92	8.84	8.56	10.65	8.83	9.20	9.33	8.06	8.81	8.03	6.04	7.85	6.16	4.25	11.26	7.62	6.92	7.57	6.69	6.89	5.92
8	CenterPoint Energy	5.49	8.48	7.95	5.94	7.03	8.45	6.97	5.96	5.75	6.25	6.56	5.15	5.39	4.70	4.05	4.29	5.17	3.94	4.70	4.26	2.08	2.16
9	CMS Energy Corp.	6.42	9.42	9.27	9.87	9.85	8.40	8.75	8.50	7.53	7.13	6.68	6.03	5.41	4.48	3.64	3.45	5.57	4.40	4.04	3.20	2.88	NMF
10	Consol. Edison	8.24	8.70	7.26	8.35	9.46	8.73	9.64	9.39	7.96	7.89	7.77	8.31	8.15	7.39	6.72	6.89	8.31	8.65	8.59	9.31	7.90	7.64
11	Dominion Resources	9.92	9.35	11.15	14.59	13.47	10.94	11.35	11.59	11.84	12.27	10.88	9.92	9.45	8.12	6.98	8.27	8.65	7.81	10.09	7.88	7.51	6.53
12	DTE Energy	6.81	9.52	10.62	7.85	9.67	8.54	9.05	8.64	8.52	6.42	6.65	5.91	5.18	4.69	3.59	4.90	5.73	5.21	5.54	6.00	5.62	5.20
13	Duke Energy	7.64	7.75	7.89	8.06	7.40	7.65	8.40	8.57	7.95	8.12	8.11	9.53	6.56	6.01	5.96	7.13	7.16	N/A	N/A	N/A	N/A	N/A
14	Edison Int'l	6.03	6.83	7.14	7.57	7.25	13.46	7.05	6.77	5.92	5.68	5.46	4.59	4.22	4.11	3.95	5.63	7.01	5.87	5.61	6.84	2.82	2.96
15	El Paso Electric	5.93	N/A	N/A	N/A	N/A	9.43	8.54	7.46	6.47	6.33	6.19	5.78	5.16	4.31	3.98	4.95	6.44	6.25	6.67	4.65	3.90	4.39
16	Emergy Corp.	5.79	7.15	5.61	5.78	6.05	4.92	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	7.52	9.39	11.41	12.53	11.47	9.16	10.36	10.14	10.12	10.14	8.08	9.30	6.99	4.97	4.61	4.12	6.18	6.02	3.55	3.78	2.85	2.75
18	Evergy, Inc.	8.04	8.66	7.41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	6.04	7.69	5.08	4.44	5.29	5.05	4.45	4.80	4.70	5.09	4.61	5.54	5.86	5.10	5.98	9.65	9.89	8.62	7.97	6.29	5.71	4.97
20	FirstEnergy Corp.	6.85	8.93	6.60	9.23	11.09	8.84	4.76	5.12	5.38	7.43	6.15	7.42	7.33	4.49	4.91	7.58	7.89	7.53	6.04	5.15	6.90	5.10
21	Fortis Inc.	8.47	9.10	9.57	9.50	9.46	7.97	8.23	10.46	7.29	9.25	7.93	8.09	8.38	7.40	6.76	7.58	9.18	7.89	N/A	N/A	N/A	N/A
22	Great Plains Energy	6.89	N/A	N/A	N/A	N/A	N/A	14.62	8.63	6.66	6.45	5.73	6.09	5.74	4.49	5.06	7.71	7.13	7.68	6.70	6.52	5.92	5.14
23	Hawaiian Elec.	8.06	7.95	8.23	8.69	9.30	8.34	9.21	7.44	9.25	7.64	8.15	8.05	7.73	7.81	6.95	9.10	7.95	8.47	8.29	8.44	6.12	6.20
24	IDACORP, Inc.	8.88	12.42	11.84	11.38	12.75	11.72	11.56	10.95	9.37	8.59	7.78	7.05	6.64	6.52	5.31	7.10	8.23	7.73	7.55	7.15	7.27	7.53
25	NextEra Energy, Inc.	9.12	15.17	20.40	15.48	12.33	10.77	11.61	9.24	7.93	7.98	7.60	7.58	5.98	5.33	6.09	7.34	9.02	6.51	6.71	6.71	5.97	5.77
26	NorthWestern Corp	7.89	8.65	8.83	8.88	9.93	8.19	8.82	8.65	8.99	9.01	7.61	6.85	5.89	5.79	5.05	5.57	8.45	9.39	7.31	8.13	N/A	N/A
27	OGE Energy	7.94	8.36	7.64	8.38	10.58	9.36	10.52	9.03	9.25	10.65	9.93	7.35	7.48	6.61	5.37	6.43	7.58	7.50	7.04	6.73	5.62	5.39
28	Otter Tail Corp.	9.33	7.70	8.61	9.99	12.42	11.58	11.09	9.38	9.04	9.45	9.58	8.43	9.04	8.07	8.01	11.65	9.53	8.66	8.18	9.01	8.13	8.33
29	Pinnacle West Capital	6.20	5.19	6.19	7.49	8.30	7.09	8.73	7.89	6.91	7.03	6.85	6.34	5.80	5.65	3.84	4.19	4.76	4.48	7.48	5.88	4.80	5.21
30	PNM Resources	6.90	6.95	7.81	7.87	7.92	7.57	7.40	7.64	6.95	7.48	6.47	5.80	4.94	4.58	4.53	7.10	10.67	7.50	7.62	6.84	5.55	5.72
31	Portland General	5.97	6.65	6.48	6.72	7.65	6.56	7.45	7.12	6.73	5.49	6.06	5.08	4.86	4.13	4.63	4.81	5.34	5.74	N/A	N/A	N/A	N/A
32	PPL Corp.	7.84	8.82	13.74	7.46	7.99	7.02	10.11	8.37	8.73	7.32	6.59	5.87	5.98	7.46	8.82	9.17	8.90	7.58	7.57	6.49	5.41	5.30
33	Public Serv. Enterprise	7.87	10.53	11.32	8.22	8.72	9.48	8.67	8.56	6.66	6.48	6.40	6.40	6.03	6.04	6.20	8.46	9.83	8.41	8.59	7.17	6.79	6.24
34	SCANA Corp.	7.09	N/A	N/A	N/A	N/A	N/A	8.26	9.59	8.33	7.50	7.49	7.40	6.75	6.52	5.88	6.38	7.15	7.03	5.40	6.86	6.59	6.36
35	Sempra Energy	8.43	9.75	13.23	10.40	12.05	10.10	10.65	10.88	9.99	10.77	9.37	7.26	6.13	6.53	6.07	7.07	8.61	7.22	6.96	5.16	4.85	4.00
36	Southern Co.	8.27	9.63	8.72	8.34	8.80	7.05	7.49	8.83	8.23	8.42	8.30	8.75	8.22	7.79	7.08	8.18	8.62	8.47	8.41	8.28	8.28	7.83
37	Vectren Corp.	7.08	N/A	N/A	N/A	N/A	N/A	10.32	8.60	7.82	7.57	6.82	5.79	5.81	5.58	5.24	6.90	6.53	7.37	7.06	7.63	7.27	6.92
38	WEC Energy Group	9.20	11.81	11.99	13.67	12.88	10.82	11.04	10.95	12.90	10.27	9.58	9.24	8.43	8.15	6.87	7.57	7.84	7.27	6.40	6.27	4.91	4.27
39	Westar Energy	6.91	N/A	N/A	N/A	N/A	N/A	10.87	10.86	9.05	7.93	7.23	6.71	6.67	5.51	5.32	7.09	6.88	5.81	7.00	6.54	4.24	2.94
40	Xcel Energy Inc.	7.01	8.62	9.19	10.07	9.44	7.90	8.50	8.10	7.62	7.31	7.00	6.85	6.47	6.28	5.43	5.71	6.51	5.54	5.62	5.31	4.27	5.46
41	Average	7.53	8.92	9.28	9.10	9.60	8.86	9.21	8.50	7.96	7.81	7.31	6.91	6.49	5.94	5.54	6.98	7.73	7.11	7.05	6.70	5.62	5.50
42	Median	7.37	8.70	8.72	8.48	9.46	8.73	9.05	8.57	7.93	7.54	7.12	6.85	6.27	5.80	5.35	7.09	7.76	7.37	7.04	6.71	5.62	5.43

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Note:

<sup>a</sup> Based on the average of the high and low price and the projected Cash Flow per share.

## Portland General Electric Company

### Electric Utilities (Valuation Metrics)

Market Price to Book Value (MP/BV) Ratio <sup>1</sup>

Line	Company	17-Year																		
		Average (1)	2022 <sup>2b</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)	2005 (19)
1	ALLETE	1.57	1.24	1.43	1.39	1.91	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	1.81	2.25	2.26	2.30	2.32	2.16	2.38	2.17	1.86	1.86	1.70	1.57	1.46	1.31	1.04	1.33	1.67	1.52	1.33
3	Ameren Corp.	1.57	2.15	2.13	2.21	2.26	1.95	1.93	1.67	1.46	1.45	1.29	1.18	0.90	0.83	0.78	1.25	1.60	1.62	1.68
4	American Electric Power	1.64	1.99	1.87	2.09	2.20	1.82	1.88	1.81	1.55	1.54	1.40	1.31	1.23	1.23	1.08	1.48	1.85	1.56	1.57
5	Avangrid, Inc.	0.92	0.89	1.01	0.97	1.02	1.02	0.93	0.83	0.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.33	1.33	1.42	1.37	1.54	1.88	1.73	1.57	1.36	1.33	1.25	1.21	1.19	1.07	0.94	1.11	1.29	1.30	1.13
7	Black Hills	1.52	1.54	1.52	1.55	1.95	1.61	2.06	1.94	1.59	1.79	1.62	1.21	1.14	1.07	0.83	1.22	1.57	1.47	1.63
8	CenterPoint Energy	2.29	1.83	1.74	1.90	2.21	2.18	2.59	2.73	2.43	2.27	2.30	1.99	1.87	1.96	1.77	2.49	3.13	2.75	3.06
9	CMS Energy Corp.	2.17	2.62	2.69	3.24	3.28	2.81	2.93	2.72	2.43	2.26	2.09	1.91	1.66	1.48	1.10	1.23	1.82	1.42	1.32
10	Consol. Edison	1.42	1.55	1.34	1.44	1.59	1.49	1.63	1.58	1.42	1.34	1.38	1.47	1.38	1.22	1.08	1.17	1.47	1.47	1.52
11	Dominion Resources	2.59	2.34	2.37	2.72	2.18	2.40	2.94	3.15	3.34	3.55	2.97	2.84	2.37	2.01	1.80	2.42	2.69	2.07	2.50
12	DTE Energy	1.64	2.60	2.82	1.80	2.07	1.91	2.01	1.82	1.65	1.62	1.51	1.35	1.20	1.16	0.89	1.10	1.35	1.29	1.39
13	Duke Energy	1.27	1.63	1.58	1.47	1.47	1.33	1.41	1.35	1.29	1.28	1.19	1.12	1.11	1.00	0.91	1.06	1.15	N/A	N/A
14	Edison Int'l	1.69	2.08	1.67	1.62	1.80	1.97	2.17	1.92	1.76	1.68	1.57	1.53	1.24	1.07	1.04	1.56	2.05	1.80	1.93
15	El Paso Electric	1.56	N/A	N/A	N/A	N/A	1.94	1.87	1.68	1.48	1.52	1.49	1.59	1.64	1.17	0.98	1.33	1.69	1.71	1.76
16	Entergy Corp.	1.75	1.81	1.75	1.93	2.03	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	1.54	1.86	2.00	2.11	1.99	1.68	1.73	1.64	1.53	1.47	1.38	1.28	1.50	1.31	1.12	1.31	1.60	1.22	1.05
18	Evergy, Inc.	1.51	1.52	1.50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Exelon Corp.	2.11	1.88	1.37	1.20	1.43	1.31	1.20	1.20	1.14	1.28	1.17	1.46	1.95	2.07	2.57	4.39	4.79	3.89	3.60
20	FirstEnergy Corp.	2.06	2.37	2.33	2.81	3.39	2.67	3.53	2.37	1.16	1.15	1.28	1.44	1.33	1.36	1.54	2.52	2.23	1.92	1.64
21	Fortis Inc.	1.48	1.56	1.48	1.47	1.41	1.24	1.41	1.26	1.33	1.35	1.45	1.59	1.59	1.56	1.33	1.48	1.63	1.96	N/A
22	Great Plains Energy	1.21	N/A	N/A	N/A	N/A	N/A	1.33	1.17	1.12	1.11	1.02	0.96	0.93	0.87	0.80	1.11	1.66	1.77	1.86
23	Hawaiian Elec.	1.68	1.94	1.81	1.82	2.02	1.76	1.76	1.63	1.71	1.49	1.54	1.62	1.54	1.44	1.16	1.61	1.57	2.01	1.78
24	IDACORP, Inc.	1.50	1.91	1.88	1.84	2.10	1.96	1.94	1.76	1.54	1.45	1.33	1.19	1.17	1.13	0.92	1.09	1.26	1.37	1.22
25	NextEra Energy, Inc.	2.36	4.07	4.27	3.58	2.75	2.32	2.35	2.30	2.09	2.15	1.93	1.74	1.55	1.49	1.70	2.06	2.34	1.80	1.93
26	NorthWestern Corp	1.45	1.25	1.43	1.45	1.74	1.48	1.64	1.68	1.60	1.54	1.56	1.42	1.35	1.22	1.07	1.15	1.48	1.65	1.42
27	OGE Energy	1.83	1.74	1.67	1.86	2.06	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
28	Otter Tail Corp.	1.89	2.31	2.33	2.04	2.62	2.49	2.33	1.90	1.78	1.90	1.96	1.58	1.35	1.19	1.18	1.71	1.93	1.76	1.74
29	Pinnacle West Capital	1.42	1.31	1.45	1.63	1.91	1.74	1.91	1.72	1.52	1.44	1.47	1.39	1.25	1.14	0.95	1.00	1.26	1.26	1.25
30	PNM Resources	1.35	1.81	1.86	1.87	2.28	1.83	1.84	1.56	1.33	1.21	1.09	0.98	0.80	0.69	0.56	0.66	1.23	1.21	1.45
31	Portland General	1.37	1.58	1.55	1.57	1.84	1.56	1.69	1.56	1.42	1.37	1.28	1.14	1.09	0.94	0.92	1.05	1.32	1.36	N/A
32	PPL Corp.	2.03	1.44	1.52	1.63	1.86	1.81	2.40	2.46	2.24	1.64	1.55	1.58	1.47	1.61	2.10	3.19	3.05	2.43	2.50
33	Public Serv. Enterprise	1.93	2.32	2.11	1.70	1.97	1.81	1.68	1.67	1.58	1.57	1.44	1.46	1.59	1.67	1.78	2.58	2.99	2.46	2.45
34	SCANA Corp.	1.51	N/A	N/A	N/A	N/A	N/A	1.65	1.74	1.47	1.48	1.48	1.48	1.36	1.33	1.20	1.45	1.62	1.64	1.72
35	Sempra Energy	1.80	1.84	1.64	1.84	2.22	2.06	2.24	2.00	2.17	2.20	1.84	1.53	1.28	1.35	1.32	1.60	1.87	1.70	1.73
36	Southern Co.	2.11	2.53	2.39	2.20	2.13	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
37	Vectren Corp.	1.83	N/A	N/A	N/A	N/A	N/A	2.75	2.29	2.11	2.08	1.82	1.57	1.53	1.41	1.34	1.64	1.74	1.77	1.82
38	WEC Energy Group	2.05	2.57	2.61	2.84	2.62	2.11	2.10	2.09	1.82	2.34	2.21	2.05	1.81	1.65	1.40	1.57	1.77	1.71	1.62
39	Westar Energy	1.37	N/A	N/A	N/A	N/A	N/A	1.94	1.95	1.49	1.44	1.33	1.26	1.20	1.10	0.93	1.10	1.36	1.30	1.41
40	Xcel Energy Inc.	1.72	2.22	2.27	2.46	2.34	1.97	2.06	1.88	1.66	1.55	1.50	1.51	1.41	1.32	1.19	1.30	1.53	1.40	1.38
41	Average	1.73	1.94	1.92	1.94	2.07	1.87	1.98	1.84	1.66	1.68	1.59	1.51	1.42	1.34	1.24	1.63	1.90	1.77	1.79
42	Median	1.69	1.86	1.75	1.84	2.04	1.83	1.91	1.74	1.55	1.53	1.49	1.47	1.35	1.31	1.14	1.46	1.68	1.71	1.72

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

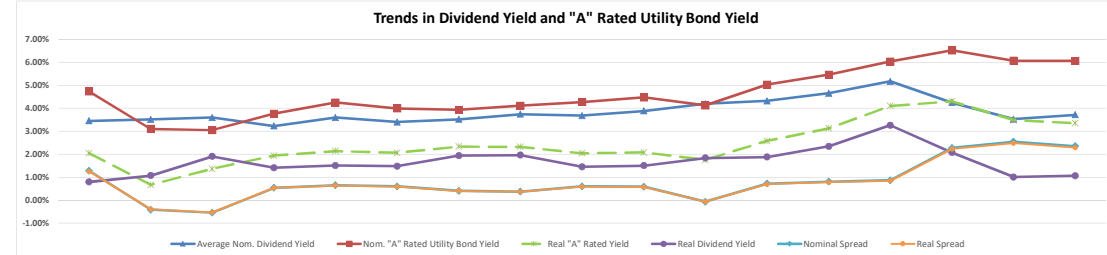
<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Notes:

Portland General Electric Company

Electric Utilities  
(Valuation Metrics)

Line	Company	Dividend Yield <sup>1</sup>																	
		17-Year Average (1)	2022 <sup>2a</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)
1	ALLETE	3.97%	4.47%	3.88%	4.03%	2.85%	2.99%	2.97%	3.56%	3.97%	3.92%	3.89%	4.49%	4.58%	5.03%	5.79%	4.37%	3.60%	3.16%
2	Alliant Energy	3.61%	3.04%	2.97%	2.90%	2.80%	3.20%	3.07%	3.21%	3.60%	3.53%	3.74%	4.07%	4.28%	4.61%	5.73%	4.10%	3.13%	3.22%
3	Ameren Corp.	4.17%	2.74%	2.74%	2.57%	2.59%	3.04%	3.12%	3.50%	3.96%	4.02%	4.61%	4.97%	5.28%	5.76%	5.98%	6.21%	4.88%	4.53%
4	American Electric Power	3.97%	3.41%	3.61%	3.28%	3.10%	3.60%	3.42%	3.54%	3.80%	3.83%	4.23%	4.58%	4.96%	4.90%	5.50%	4.20%	3.40%	4.06%
5	Avangrid, Inc.	3.75%	3.94%	3.53%	3.69%	3.52%	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.	3.60%	4.26%	3.94%	4.03%	3.48%	2.93%	3.14%	3.39%	3.97%	3.99%	4.51%	4.55%	4.54%	4.76%	4.46%	3.39%	2.68%	2.52%
7	Black Hills	3.71%	3.44%	3.50%	3.42%	2.74%	3.31%	2.75%	2.87%	3.55%	2.84%	3.19%	4.39%	4.64%	4.79%	6.17%	4.21%	3.40%	3.79%
8	CenterPoint Energy	4.23%	2.39%	2.77%	4.38%	2.98%	4.09%	4.79%	4.70%	5.06%	3.94%	3.57%	4.04%	4.27%	5.29%	6.37%	4.98%	3.87%	4.39%
9	CMS Energy Corp.	3.18%	2.92%	2.92%	2.65%	2.64%	3.03%	2.68%	2.99%	3.36%	3.59%	3.76%	4.16%	4.28%	3.98%	3.97%	2.69%	1.16%	N/A
10	Consolidated Edison	4.33%	3.51%	4.10%	3.87%	3.44%	3.68%	3.40%	3.62%	4.12%	4.38%	4.25%	4.07%	4.46%	5.16%	5.99%	5.67%	4.84%	5.04%
11	Dominion Resources	3.99%	3.66%	3.38%	4.31%	4.76%	4.72%	3.88%	3.82%	3.66%	3.43%	3.78%	4.06%	4.13%	4.41%	5.20%	3.77%	3.32%	3.60%
12	DTE Energy	3.99%	2.94%	3.06%	3.57%	3.07%	3.34%	3.15%	3.34%	3.53%	3.54%	3.84%	4.19%	4.68%	4.75%	6.29%	5.24%	4.36%	4.86%
13	Duke Energy	4.62%	3.98%	4.02%	4.35%	4.17%	4.54%	4.15%	4.26%	4.34%	4.26%	4.45%	4.68%	5.21%	5.71%	6.25%	5.16%	4.44%	N/A
14	Edison Intl	3.30%	4.45%	4.39%	4.29%	3.73%	3.84%	2.87%	2.81%	2.83%	2.62%	2.85%	2.97%	3.37%	3.66%	3.95%	2.69%	2.21%	2.58%
15	El Paso Electric	2.74%	N/A	N/A	N/A	N/A	N/A	2.55%	2.49%	2.75%	3.13%	2.97%	2.99%	2.97%	2.11%	N/A	N/A	N/A	N/A
16	Entergy Corp.	4.02%	3.70%	3.84%	3.55%	3.52%	4.41%	4.49%	4.55%	4.59%	4.47%	5.07%	4.91%	4.85%	4.20%	3.97%	2.92%	2.39%	2.82%
17	Eversource Energy	3.23%	3.09%	2.85%	2.63%	2.81%	3.32%	3.14%	3.22%	3.34%	3.40%	3.48%	3.52%	3.23%	3.64%	4.16%	3.25%	2.60%	3.27%
18	Energy, Inc.	3.63%	3.66%	3.59%	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	Enelon Corp.	3.75%	2.89%	3.17%	3.82%	3.06%	3.32%	3.51%	3.75%	3.88%	3.69%	4.69%	5.73%	4.96%	4.95%	4.26%	2.78%	2.48%	2.83%
20	FirstEnergy Corp.	4.31%	3.71%	4.39%	4.17%	3.50%	5.17%	4.62%	4.31%	4.23%	4.26%	4.90%	5.23%	5.76%	5.09%	3.21%	3.12%	3.40%	3.04%
21	Fortis Inc.	3.69%	3.82%	3.77%	3.66%	3.60%	4.07%	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	N/A	N/A	N/A	N/A	3.58%	3.64%	3.76%	3.62%	3.84%	4.08%	4.15%	4.49%	5.03%	6.96%	5.49%	5.60%
23	Hawaiian Elec.	4.42%	3.59%	3.44%	3.40%	3.02%	3.54%	3.65%	3.99%	4.05%	4.76%	4.72%	4.70%	5.04%	5.51%	6.89%	5.00%	5.18%	4.59%
24	IDACORP, Inc.	3.16%	2.86%	2.89%	2.92%	2.49%	2.61%	2.58%	2.77%	3.06%	3.12%	3.21%	3.28%	3.10%	3.44%	4.46%	3.95%	3.55%	3.39%
25	NextEra Energy, Inc.	2.90%	2.11%	1.90%	2.10%	2.41%	2.68%	2.79%	2.91%	3.01%	3.02%	3.30%	3.65%	3.96%	3.90%	N/A	N/A	N/A	N/A
26	NorthWestern Corp.	4.10%	4.51%	4.00%	4.02%	3.28%	3.86%	3.52%	3.43%	3.61%	3.30%	3.68%	4.17%	4.51%	4.93%	5.75%	5.38%	4.09%	3.65%
27	OGE Energy	3.78%	4.30%	4.81%	4.68%	3.54%	3.98%	3.61%	3.87%	3.51%	2.83%	3.15%	2.83%	2.94%	3.08%	3.68%	4.98%	4.52%	3.77%
28	Otter Tail Corp.	3.93%	2.44%	2.81%	3.45%	2.74%	2.92%	3.12%	3.87%	4.33%	4.14%	4.11%	5.21%	5.57%	5.68%	5.38%	3.63%	3.46%	3.92%
29	Pinnacle West Capital	4.51%	4.90%	4.44%	3.97%	3.29%	3.55%	3.16%	3.46%	3.88%	4.09%	3.98%	5.32%	4.81%	5.43%	6.76%	6.17%	4.75%	4.67%
30	PNM Resources	3.15%	3.04%	2.09%	2.80%	2.45%	2.79%	2.53%	2.69%	2.90%	2.79%	2.99%	2.96%	3.19%	4.49%	4.76%	4.85%	3.36%	3.21%
31	Portland General	3.65%	3.63%	3.62%	3.47%	2.85%	3.27%	3.92%	3.06%	3.27%	3.34%	3.67%	4.11%	4.37%	5.20%	5.36%	4.22%	3.34%	2.54%
32	PPL Corp.	4.53%	3.23%	5.83%	5.84%	5.24%	5.61%	4.24%	4.25%	4.55%	4.45%	4.81%	5.07%	5.10%	5.12%	4.51%	3.10%	2.69%	3.41%
33	Public Serv. Enterprise	3.74%	3.37%	3.37%	3.64%	3.19%	3.49%	3.74%	3.78%	3.81%	3.92%	4.35%	4.55%	4.40%	4.30%	4.36%	3.20%	2.73%	3.47%
34	SCANA Corp.	4.37%	N/A	N/A	N/A	N/A	N/A	4.03%	3.29%	3.90%	4.05%	4.15%	4.25%	4.78%	4.93%	5.67%	4.92%	4.29%	4.21%
35	Sempra Energy	2.98%	2.99%	3.39%	3.24%	2.88%	3.20%	2.92%	2.92%	2.71%	2.61%	3.03%	3.71%	3.65%	3.08%	3.23%	2.62%	2.08%	2.47%
36	Southern Co.	4.60%	3.82%	4.17%	4.36%	4.41%	5.27%	4.63%	4.42%	4.78%	4.69%	4.61%	4.29%	4.63%	5.13%	5.52%	4.58%	4.39%	4.52%
37	Vectren Corp.	4.38%	N/A	N/A	N/A	N/A	N/A	2.79%	3.31%	3.60%	3.62%	4.15%	4.82%	5.06%	5.53%	5.85%	4.79%	4.53%	4.52%
38	WEC Energy Group	3.03%	3.08%	3.00%	2.68%	2.81%	3.38%	3.31%	3.35%	3.49%	3.40%	3.49%	3.24%	3.35%	2.97%	3.16%	2.41%	2.14%	2.18%
39	Westar Energy	4.37%	N/A	N/A	N/A	N/A	N/A	3.00%	2.90%	3.73%	3.88%	4.27%	4.57%	4.84%	5.32%	6.27%	5.22%	4.16%	4.28%
40	Xcel Energy Inc.	3.71%	2.90%	2.81%	2.58%	2.75%	3.25%	3.10%	3.33%	3.69%	3.53%	3.86%	3.90%	4.20%	4.54%	5.14%	4.70%	4.05%	4.40%
41	Average	3.85%	3.45%	3.52%	3.60%	3.23%	3.60%	3.40%	3.52%	3.74%	3.68%	3.89%	4.20%	4.32%	4.66%	5.18%	4.25%	3.53%	3.72%
42	Median	3.62%	3.44%	3.50%	3.61%	3.06%	3.38%	3.16%	3.46%	3.75%	3.76%	3.85%	4.18%	4.48%	4.79%	5.28%	4.35%	3.43%	3.62%
43	20-Yr Treasury Yields <sup>3</sup>	3.19%	3.30%	1.98%	1.35%	2.40%	3.02%	2.65%	2.23%	2.55%	3.07%	3.12%	2.54%	3.62%	4.03%	4.11%	4.36%	4.91%	4.99%
44	20-Yr TIPS <sup>3</sup>	1.03%	0.64%	-0.43%	-0.30%	0.60%	0.84%	0.75%	0.66%	0.78%	0.87%	0.75%	0.21%	1.19%	1.37%	2.21%	2.19%	2.36%	2.31%
45	Implied Inflation <sup>4</sup>	2.14%	2.64%	2.42%	1.66%	1.79%	2.06%	1.89%	1.56%	1.75%	2.19%	2.35%	2.33%	2.40%	2.26%	1.85%	2.13%	2.49%	2.62%
46	Real Dividend Yield <sup>5</sup>	1.67%	0.79%	1.07%	1.90%	1.41%	1.51%	1.48%	1.94%	1.96%	1.46%	1.50%	1.83%	1.88%	2.35%	3.26%	2.07%	1.01%	1.06%
A-Rated Utility																			
47	Nominal "A" Rated Yield <sup>6</sup>	4.65%	4.74%	3.10%	3.05%	3.77%	4.25%	4.00%	3.93%	4.12%	4.28%	4.48%	4.13%	5.04%	5.46%	6.04%	6.53%	6.07%	6.07%
48	Real "A" Rated Yield	2.46%	2.05%	0.67%	1.37%	1.94%	2.14%	2.07%	2.34%	2.33%	2.04%	2.08%	1.76%	2.58%	3.13%	4.11%	4.13%	3.49%	3.36%
Baa-Rated Utility																			
49	Nominal "Baa" Rated Yield	5.17%	5.05%	3.36%	3.44%	4.19%	4.67%	4.38%	4.67%	5.03%	4.89%	4.98%	4.83%	5.57%	5.96%	7.06%	7.25%	6.33%	6.32%
50	Real "Baa" Rated Yield	2.98%	2.35%	0.91%	1.74%	2.36%	2.95%	2.44%	3.07%	3.22%	2.55%	2.57%	2.44%	3.09%	3.62%	5.11%	5.01%	3.74%	3.60%
Spreads (A-Rated Utility Bond - Stock)																			
51	Nominal Spread <sup>7</sup>	0.80%	1.29%	-0.41%	-0.55%	0.54%	0.65%	0.60%	0.41%	0.37%	0.60%	0.59%	-0.07%	0.72%	0.80%	0.86%	2.28%	2.55%	2.35%
52	Real Spread <sup>8</sup>	0.78%	1.26%	-0.40%	-0.54%	0.53%	0.64%	0.59%	0.40%	0.36%	0.59%	0.58%	-0.07%	0.70%	0.79%	0.85%	2.23%	2.49%	2.29%
Spreads (Baa-Rated Utility Bond - Stock)																			
53	Nominal Spread <sup>9</sup>	1.32%	1.60%	-0.16%	-0.16%	0.97%	1.07%	0.98%	1.15%	1.28%	1.12%	1.10%	0.62%	1.24%	1.30%	1.88%	3.00%	2.89%	2.60%
54	Real Spread <sup>10</sup>	1.29%	1.56%	-0.16%	-0.16%	0.95%	1.05%	0.96%	1.13%	1.26%	1.10%	1.07%	0.61%	1.22%	1.28%	1.84%	2.93%	2.74%	2.53%
Spreads (Treasury Bond - Stock)																			
55	Nominal <sup>11</sup>	-0.66%	-0.15%	-1.54%	-2.24%	-0.83%	-0.58%	-0.75%	-1.30%	-1.20%	-0.60%	-0.77%	-1.66%	-0.70%	-0.63%	-1.07%	0.11%	1.38%	1.28%
56	Real <sup>12</sup>	-0.65%	-0.15%	-1.50%	-2.21%	-0.81%	-0.57%	-0.78%	-1.28%	-1.18%	-0.59%	-0.78%	-1.62%	-0.68%	-0.62%	-1.05%	0.11%	1.35%	1.24%



Sources:  
<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.  
<sup>2</sup> Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.  
<sup>3</sup> Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.  
<sup>4</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.  
<sup>5</sup> St. Louis Federal Reserve, Economic Research, <https://research.stlouisfed.org>.  
<sup>6</sup> www.moodys.com, Bond Yields and Key Indicators, through December 31, 2022.  
Notes:  
<sup>7</sup> Based on the average of the high and low price and the projected Dividends Declared per share, published in the Value Line Investment Survey.  
<sup>8</sup> Line 47 = (1 + Line 45) / (1 + Line 46) - 1.  
<sup>9</sup> Line 48 = (1 + Line 43) / (1 + Line 47) - 1.  
<sup>10</sup> The spread being measured here is the nominal A-rated utility bond yield over the average nominal utility dividend yield; (Line 49 - Line 43).  
<sup>11</sup> The spread being measured here is the real A-rated utility bond yield over the average real utility dividend yield; (Line 50 - Line 48).  
<sup>12</sup> The spread being measured here is the nominal 20-Year Treasury yield over the average nominal utility dividend yield; (Line 45 - Line 43).  
<sup>13</sup> The spread being measured here is the real 20-Year TIPS yield over the average real utility dividend yield; (Line 48 - Line 46)



**Portland General Electric Company**

**Electric Utilities  
(Valuation Metrics)**

Line	Company	Dividend per Share <sup>1</sup>																	
		17-Year																	
		Average (1)	2022 <sup>2</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)
1	ALLETE	2.01	2.60	2.52	2.47	2.35	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	1.08	1.71	1.61	1.52	1.42	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.	1.91	2.36	2.20	2.00	1.92	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	2.17	3.17	3.00	2.84	2.71	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.	1.75	1.76	1.76	1.76	1.76	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.	1.21	1.76	1.69	1.62	1.55	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	1.70	2.41	2.29	2.17	2.05	1.93	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	0.86	0.70	0.66	0.90	0.86	1.12	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.	1.10	1.84	1.74	1.63	1.53	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	2.63	3.16	3.10	3.06	2.96	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	2.40	2.67	2.52	3.45	3.67	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	2.88	3.54	3.88	4.12	3.85	3.59	3.36	3.06	2.84	2.69	2.59	2.42	2.32	2.18	2.12	2.12	2.12	2.08
13	Duke Energy	3.28	3.98	3.90	3.82	3.75	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	1.79	2.84	2.69	2.58	2.48	2.43	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	N/A	N/A	N/A	N/A	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.	3.32	4.10	3.86	3.74	3.66	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	1.56	2.55	2.41	2.27	2.14	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.	2.26	2.33	2.18	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.	1.63	1.35	1.53	1.53	1.45	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
20	FirstEnergy Corp.	1.78	1.56	1.56	1.56	1.53	1.82	1.44	1.44	1.44	1.44	1.65	2.20	2.20	2.20	2.20	2.20	2.05	1.85
21	Fortis Inc.	1.41	2.17	2.08	1.97	1.86	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
22	Great Plains Energy	1.11	N/A	N/A	N/A	N/A	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
23	Hawaiian Elec.	1.26	1.40	1.36	1.32	1.28	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
24	IDACORP, Inc.	1.87	3.04	2.88	2.72	2.56	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
25	NextEra Energy, Inc.	0.85	1.70	1.54	1.40	1.25	1.11	0.98	0.87	0.77	0.73	0.66	0.60	0.55	0.50	0.47	0.45	0.41	0.38
26	NorthWestern Corp	1.79	2.52	2.48	2.40	2.30	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	1.06	1.64	1.63	1.58	1.51	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.	1.29	1.65	1.56	1.48	1.40	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	Pinnacle West Capital	2.55	3.42	3.36	3.23	3.04	2.87	2.70	2.56	2.44	2.33	2.23	2.67	2.10	2.10	2.10	2.10	2.10	2.03
30	PNM Resources	0.85	1.41	0.98	1.25	1.18	1.09	0.99	0.88	0.80	0.76	0.68	0.58	0.50	0.50	0.50	0.61	0.91	0.86
31	Portland General	1.22	1.79	1.70	1.59	1.52	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
32	PPL Corp.	1.43	0.88	1.66	1.66	1.65	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
33	Public Serv. Enterprise	1.57	2.16	2.04	1.96	1.88	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
34	SCANA Corp.	2.00	N/A	N/A	N/A	N/A	N/A	2.45	2.30	2.18	2.10	2.03	1.98	1.94	1.90	1.88	1.84	1.76	1.68
35	Sempra Energy	2.71	4.58	4.40	4.18	3.87	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
36	Southern Co.	2.10	2.70	2.62	2.54	2.46	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
37	Vectren Corp.	1.42	N/A	N/A	N/A	N/A	N/A	1.71	1.62	1.54	1.46	1.43	1.41	1.39	1.37	1.35	1.31	1.27	1.23
38	WEC Energy Group	1.57	2.91	2.71	2.53	2.36	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
39	Westar Energy	1.30	N/A	N/A	N/A	N/A	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
40	Xcel Energy Inc.	1.28	1.95	1.83	1.72	1.62	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
41	<b>Average</b>	<b>1.74</b>	<b>2.35</b>	<b>2.28</b>	<b>2.25</b>	<b>2.16</b>	<b>2.05</b>	<b>1.91</b>	<b>1.80</b>	<b>1.71</b>	<b>1.62</b>	<b>1.57</b>	<b>1.55</b>	<b>1.47</b>	<b>1.43</b>	<b>1.39</b>	<b>1.40</b>	<b>1.33</b>	<b>1.25</b>
42	<b>Industry Average Growth</b>	<b>4.05%</b>	<b>2.98%</b>	<b>1.43%</b>	<b>4.36%</b>	<b>5.33%</b>	<b>7.06%</b>	<b>6.02%</b>	<b>5.44%</b>	<b>5.37%</b>	<b>3.48%</b>	<b>0.97%</b>	<b>5.83%</b>	<b>2.45%</b>	<b>3.16%</b>	<b>-0.52%</b>	<b>4.95%</b>	<b>6.51%</b>	

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Portland General Electric Company

Electric Utilities  
(Valuation Metrics)

Line	Company	Earnings per Share <sup>1</sup>																	
		17-Year Average (1)	2022 <sup>2</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)
1	ALLETE	2.93	3.38	3.23	3.35	3.33	3.38	3.13	3.14	3.38	2.90	2.63	2.58	2.65	2.19	1.89	2.82	3.08	2.77
2	Alliant Energy	1.76	2.73	2.63	2.47	2.33	2.19	1.99	1.65	1.69	1.74	1.65	1.53	1.39	1.39	0.95	1.27	1.35	1.03
3	Ameren Corp.	2.91	4.14	3.84	3.50	3.35	3.32	2.77	2.68	2.38	2.40	2.10	2.41	2.47	2.77	2.78	2.88	2.98	2.66
4	American Electric Power	3.54	4.51	4.96	4.42	4.08	3.90	3.62	4.23	3.59	3.34	3.18	2.98	3.13	2.60	2.97	2.99	2.86	2.86
5	Avangrid, Inc.	1.86	2.32	1.97	1.88	2.26	1.92	1.67	1.98	0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	1.80	2.12	2.10	1.90	2.97	2.07	1.95	2.15	1.89	1.84	1.85	1.32	1.72	1.65	1.58	1.36	0.72	1.47
7	Black Hills	2.64	3.97	3.74	3.73	3.53	3.47	3.38	2.63	2.83	2.89	2.61	1.97	1.01	1.66	2.32	0.18	2.68	2.21
8	CenterPoint Energy	1.21	1.38	0.94	1.29	1.49	0.74	1.57	1.00	1.08	1.42	1.24	1.35	1.27	1.07	1.01	1.30	1.17	1.33
9	CMS Energy Corp.	1.76	2.84	2.58	2.64	2.39	2.32	2.17	1.98	1.89	1.74	1.66	1.53	1.45	1.33	0.93	1.23	0.64	0.64
10	Consol. Edison	3.84	4.55	4.74	3.94	4.08	4.55	4.10	3.94	4.05	3.62	3.93	3.86	3.57	3.47	3.14	3.36	3.48	2.95
11	Dominion Resources	2.91	4.11	3.19	1.82	2.19	3.25	3.53	3.44	3.20	3.05	3.09	2.75	2.76	2.89	2.64	3.04	2.13	2.40
12	DTE Energy	4.44	5.52	4.10	7.08	6.31	6.17	5.73	4.83	4.44	5.10	3.76	3.88	3.67	3.74	3.24	2.73	2.66	2.45
13	Duke Energy	4.00	5.27	4.93	3.92	5.07	4.13	4.22	3.71	4.10	4.13	3.98	3.71	4.14	4.02	3.39	3.03	3.60	2.73
14	Edison Int'l	3.14	1.60	2.00	1.72	3.98	-1.26	4.51	3.94	4.15	4.33	3.78	4.55	3.23	3.35	3.24	3.68	3.32	3.28
15	El Paso Electric	2.02	N/A	N/A	N/A	N/A	2.07	2.42	2.39	2.03	2.27	2.20	2.26	2.48	2.07	1.50	1.73	1.63	1.27
16	Entergy Corp.	6.10	5.37	6.87	6.90	6.30	5.88	5.19	6.88	5.81	5.77	4.96	6.02	7.55	6.66	6.30	6.20	5.60	5.36
17	Eversource Energy	2.60	4.09	3.54	3.55	3.45	3.25	3.11	2.96	2.76	2.58	2.49	1.89	2.22	2.10	1.91	1.86	1.59	0.82
18	Energy, Inc.	3.55	3.26	3.83	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.	2.86	2.26	1.74	2.60	3.01	2.07	2.78	1.80	2.54	2.10	2.31	1.92	3.75	3.87	4.29	4.10	4.03	3.50
20	FirstEnergy Corp.	2.57	2.41	2.69	1.85	1.84	1.33	2.73	2.10	2.00	0.85	2.97	2.13	1.88	3.25	3.32	4.38	4.22	3.82
21	Fortis Inc.	1.97	2.78	2.61	2.60	2.68	2.52	2.66	1.89	2.11	1.38	1.63	1.65	1.74	1.62	1.51	1.52	1.29	1.36
22	Great Plains Energy	1.33	N/A	N/A	N/A	N/A	N/A	-0.06	1.61	1.37	1.57	1.62	1.35	1.25	1.53	1.03	1.16	1.85	1.62
23	Hawaiian Elec.	1.62	2.20	2.25	1.81	1.99	1.85	1.64	2.29	1.50	1.64	1.62	1.67	1.44	1.21	0.91	1.07	1.11	1.33
24	IDACORP, Inc.	3.65	5.11	4.85	4.69	4.61	4.49	4.21	3.94	3.87	3.85	3.64	3.37	3.36	2.95	2.64	2.18	1.86	2.35
25	NextEra Energy, Inc.	1.46	2.90	1.81	2.10	1.94	1.67	1.63	1.45	1.52	1.40	1.21	1.14	1.21	1.19	0.99	1.02	0.82	0.81
26	NorthWestern Corp	2.67	3.29	3.60	3.06	3.53	3.40	3.34	3.39	2.90	2.99	2.46	2.26	2.53	2.14	2.02	1.77	1.44	1.31
27	OGE Energy	1.79	2.25	2.36	2.08	2.24	2.12	1.92	1.69	1.69	1.98	1.94	1.79	1.73	1.50	1.33	1.25	1.32	1.23
28	Otter Tail Corp.	1.92	6.78	4.23	2.34	2.17	2.06	1.86	1.60	1.56	1.55	1.37	1.05	0.45	0.38	0.71	1.09	1.78	1.69
29	Pinnacle West Capital	3.74	4.26	5.47	4.87	4.77	4.54	4.43	3.95	3.92	3.58	3.66	3.50	2.99	3.08	2.26	2.12	2.96	3.17
30	PNM Resources	1.50	2.69	2.27	2.15	2.28	1.66	1.92	1.65	1.64	1.45	1.41	1.31	1.08	0.87	0.58	0.11	0.76	1.72
31	Portland General	2.00	2.74	2.72	1.72	2.39	2.37	2.29	2.16	2.04	2.18	1.77	1.87	1.95	1.66	1.31	1.39	2.33	1.14
32	PPL Corp.	2.18	1.41	0.53	2.04	2.37	2.58	2.11	2.79	2.37	2.38	2.38	2.61	2.61	2.29	1.19	2.45	2.63	2.29
33	Public Serv. Enterprise	2.92	3.47	2.55	3.61	3.90	2.76	2.82	2.83	3.30	2.99	2.45	2.44	3.11	3.07	3.08	2.90	2.59	1.85
34	SCANA Corp.	3.30	N/A	N/A	N/A	N/A	N/A	4.20	4.16	3.81	3.79	3.39	3.15	2.97	2.98	2.85	2.95	2.74	2.59
35	Sempra Energy	4.98	9.21	4.01	6.58	5.97	5.48	4.63	4.24	5.23	4.63	4.22	4.35	4.47	4.02	4.78	4.43	4.26	4.23
36	Southern Co.	2.78	3.61	3.42	3.25	3.17	3.00	3.21	2.83	2.84	2.77	2.70	2.67	2.55	2.36	2.32	2.25	2.28	2.10
37	Vectren Corp.	1.94	N/A	N/A	N/A	N/A	N/A	2.60	2.55	2.39	2.02	1.66	1.94	1.73	1.64	1.79	1.63	1.83	1.44
38	WEC Energy Group	2.65	4.46	4.11	3.79	3.58	3.34	3.14	2.96	2.34	2.59	2.51	2.35	2.18	1.92	1.60	1.52	1.42	1.32
39	Westar Energy	1.96	N/A	N/A	N/A	N/A	N/A	2.27	2.43	2.09	2.35	2.27	2.15	1.79	1.80	1.28	1.31	1.84	1.88
40	Xcel Energy Inc.	2.08	3.17	2.96	2.79	2.64	2.47	2.30	2.21	2.10	2.03	1.91	1.85	1.72	1.56	1.49	1.46	1.35	1.35
41	<b>Average</b>	<b>2.70</b>	<b>3.60</b>	<b>3.24</b>	<b>3.18</b>	<b>3.30</b>	<b>2.89</b>	<b>2.92</b>	<b>2.82</b>	<b>2.70</b>	<b>2.66</b>	<b>2.53</b>	<b>2.45</b>	<b>2.45</b>	<b>2.36</b>	<b>2.19</b>	<b>2.20</b>	<b>2.27</b>	<b>2.11</b>
42	<b>Industry Average Growth</b>	<b>3.50%</b>	<b>11.28%</b>	<b>1.94%</b>	<b>-3.70%</b>	<b>14.28%</b>	<b>-0.95%</b>	<b>3.31%</b>	<b>4.55%</b>	<b>1.35%</b>	<b>5.18%</b>	<b>3.33%</b>	<b>-0.08%</b>	<b>3.73%</b>	<b>8.14%</b>	<b>-0.77%</b>	<b>-2.88%</b>	<b>7.31%</b>	

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

## Portland General Electric Company

### Electric Utilities (Valuation Metrics)

Line	Company	Cash Flow / Capital Spending					3 - 5 yr <sup>4</sup>
		2019 <sup>1</sup> (1)	2020 <sup>1</sup> (2)	2021 <sup>2</sup> (3)	2022 <sup>3</sup> (4)	2023 <sup>4</sup> (5)	Projection (5)
1	ALLETE	0.63x	0.74x	0.80x	2.26x	1.39x	1.31x
2	Alliant Energy	0.73x	0.82x	0.97x	0.94x	0.96x	1.19x
3	Ameren Corp.	0.79x	0.51x	0.59x	0.72x	0.74x	0.94x
4	American Electric Power	0.75x	0.74x	0.69x	0.73x	0.72x	1.05x
5	Avangrid, Inc.	0.70x	0.56x	0.62x	0.61x	0.57x	0.66x
6	Avista Corp.	0.89x	0.85x	0.87x	0.83x	0.78x	1.01x
7	Black Hills	0.51x	0.72x	0.76x	0.85x	0.82x	1.05x
8	CenterPoint Energy	0.83x	0.88x	0.62x	0.62x	0.49x	0.63x
9	CMS Energy Corp.	0.79x	0.82x	0.77x	0.78x	0.84x	0.90x
10	Consol. Edison	0.79x	0.82x	0.89x	0.83x	0.72x	0.87x
11	Dominion Resources	0.81x	1.00x	0.89x	0.74x	0.63x	0.92x
12	DTE Energy	0.83x	0.67x	0.70x	0.75x	0.82x	0.92x
13	Duke Energy	0.78x	0.86x	0.93x	0.81x	0.79x	0.87x
14	Edison Int'l	0.69x	0.67x	0.74x	0.67x	0.75x	0.83x
15	El Paso Electric	0.96x	1.00x	0.83x	N/A	N/A	N/A
16	Entergy Corp.	0.79x	0.81x	1.05x	0.98x	0.85x	0.96x
17	Eversource Energy	0.78x	0.95x	0.74x	0.72x	0.86x	1.08x
18	Evergy, Inc.	1.34x	1.06x	0.96x	0.94x	0.86x	0.97x
19	Exelon Corp.	1.18x	1.30x	1.32x	0.96x	0.99x	1.07x
20	FirstEnergy Corp.	0.74x	0.96x	0.91x	0.86x	0.80x	0.88x
21	Fortis Inc.	0.68x	0.60x	0.74x	0.75x	0.82x	0.91x
22	Hawaiian Elec.	1.12x	1.10x	1.42x	1.30x	1.51x	1.48x
23	IDACORP, Inc.	1.25x	1.25x	1.16x	0.83x	0.63x	0.97x
24	NextEra Energy, Inc.	0.67x	0.58x	0.69x	0.54x	0.59x	0.74x
25	NorthWestern Corp	1.07x	0.98x	0.82x	0.66x	0.75x	1.28x
26	OGE Energy	1.26x	1.43x	1.13x	0.99x	0.97x	1.32x
27	Otter Tail Corp.	0.80x	0.45x	1.42x	1.45x	1.08x	0.96x
28	Pinnacle West Capital	0.98x	0.98x	0.85x	0.78x	0.95x	1.03x
29	PNM Resources	0.72x	0.59x	0.51x	0.63x	0.63x	0.91x
30	Portland General	0.99x	0.75x	0.97x	1.01x	0.58x	0.99x
31	PPL Corp.	0.92x	1.06x	1.12x	1.35x	0.98x	0.93x
32	Public Serv. Enterprise	1.07x	1.00x	1.05x	0.82x	0.87x	1.07x
33	Sempra Energy	0.66x	0.92x	0.78x	0.92x	0.96x	1.27x
34	Southern Co.	0.88x	1.01x	0.93x	0.97x	0.97x	1.23x
35	WEC Energy Group	0.91x	0.70x	0.75x	0.87x	0.92x	1.15x
36	Xcel Energy Inc.	0.69x	0.99x	0.86x	0.80x	0.92x	1.05x
37	Average	0.86x	0.86x	0.88x	0.89x	0.84x	1.01x
38	Median	0.80x	0.86x	0.86x	0.83x	0.82x	0.97x

Source:

<sup>1</sup> The Value Line Investment Survey, January 24, February 14, and March 13, 2020.

<sup>2</sup> The Value Line Investment Survey, March 12, April 23, and May 14, 2021.

<sup>3</sup> The Value Line Investment Survey, March 11, April 22, and May 13, 2022.

<sup>4</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Notes:

Based on the projected Cash Flow per share and Capital Spending per share.

Portland General Electric Company

Electric Utilities  
(Valuation Metrics)

Line	Company	Percent Dividends to Book Value <sup>1</sup>																	
		17-Year Average (1)	2022 <sup>2a</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)
1	ALLETE	5.92%	5.52%	5.56%	5.61%	5.44%	5.35%	5.29%	5.45%	5.45%	5.59%	5.86%	6.04%	6.18%	6.46%	6.67%	6.78%	6.80%	6.62%
2	Alliant Energy	6.36%	6.84%	6.73%	6.68%	6.68%	6.90%	7.32%	6.96%	6.70%	6.56%	6.36%	6.37%	6.26%	6.06%	5.98%	5.48%	5.23%	5.04%
3	Ameren Corp.	6.01%	5.88%	5.84%	5.67%	5.87%	5.92%	6.01%	5.86%	5.78%	5.82%	5.93%	5.87%	4.76%	4.79%	4.66%	7.74%	7.84%	7.97%
4	American Electric Power	6.31%	6.80%	6.74%	6.86%	6.82%	6.56%	6.43%	6.42%	5.90%	5.91%	5.91%	5.99%	6.10%	6.04%	5.97%	6.23%	6.28%	6.32%
5	Avangrid, Inc.	3.11%	3.51%	3.57%	3.58%	3.57%	3.57%	3.54%	3.53%	0.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	5.03%	5.65%	5.61%	5.53%	5.37%	5.52%	5.41%	5.33%	5.38%	5.33%	5.65%	5.51%	5.42%	5.07%	4.23%	3.77%	3.44%	3.26%
7	Black Hills	5.33%	5.32%	5.32%	5.32%	5.34%	5.31%	5.67%	5.55%	5.66%	5.06%	5.17%	5.31%	5.30%	5.14%	5.10%	5.15%	5.34%	5.58%
8	CenterPoint Energy	9.53%	4.39%	4.82%	8.35%	6.59%	8.94%	12.39%	12.82%	12.30%	8.96%	8.23%	8.05%	7.97%	10.36%	11.28%	12.40%	12.12%	12.09%
9	CMS Energy Corp.	6.63%	7.63%	7.87%	8.57%	8.66%	8.52%	8.43%	8.14%	8.16%	8.10%	7.86%	7.94%	7.05%	5.90%	4.38%	3.31%	2.11%	0.00%
10	Consol. Edison	6.01%	5.42%	5.48%	5.56%	5.46%	5.49%	5.55%	5.72%	5.84%	5.87%	5.88%	5.97%	6.15%	6.27%	6.47%	6.60%	7.12%	7.40%
11	Dominion Resources	10.24%	8.54%	8.00%	11.72%	10.39%	11.31%	11.41%	12.04%	12.20%	12.16%	11.24%	11.50%	9.81%	8.86%	9.38%	9.14%	8.95%	7.46%
12	DTE Energy	6.20%	7.64%	8.64%	6.43%	6.34%	6.38%	6.34%	6.09%	5.81%	5.72%	5.79%	5.66%	5.60%	5.49%	5.59%	5.76%	5.91%	6.28%
13	Duke Energy	5.43%	6.47%	6.34%	6.39%	6.12%	6.04%	5.85%	5.73%	5.61%	5.45%	5.28%	5.22%	5.81%	5.72%	5.66%	5.45%	5.12%	0.00%
14	Edison Int'l	5.50%	9.24%	7.36%	6.96%	6.73%	7.56%	6.23%	5.39%	4.97%	4.41%	4.48%	4.54%	4.16%	3.90%	4.12%	4.19%	4.53%	4.65%
15	El Paso Electric	2.94%	N/A	N/A	5.13%	N/A	4.94%	4.67%	4.62%	4.63%	4.53%	4.46%	4.72%	3.47%	0.00%	0.00%	0.00%	0.00%	0.00%
16	Entergy Corp.	6.72%	6.68%	6.72%	6.85%	7.13%	7.65%	7.90%	7.58%	6.44%	5.95%	6.15%	6.42%	6.53%	6.82%	6.59%	7.13%	6.34%	5.34%
17	Eversource Energy	4.99%	5.74%	5.69%	5.54%	5.59%	5.57%	5.43%	5.27%	5.12%	4.99%	4.82%	4.49%	4.86%	4.75%	4.66%	4.26%	4.16%	4.00%
18	Energy, Inc.	5.43%	5.57%	5.41%	5.32%	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.	7.11%	5.42%	4.36%	4.62%	4.38%	4.34%	4.23%	4.51%	4.42%	4.72%	5.49%	8.36%	9.66%	10.25%	10.96%	12.21%	11.87%	11.02%
20	FirstEnergy Corp.	8.79%	8.78%	10.26%	11.70%	11.86%	13.82%	16.34%	10.21%	4.91%	4.88%	5.44%	7.03%	6.93%	7.85%	7.84%	8.10%	8.96%	8.54%
21	Fortis Inc.	5.40%	5.95%	5.59%	5.39%	5.08%	5.03%	5.19%	4.80%	5.00%	5.22%	5.58%	5.81%	5.70%	5.91%	5.60%	5.55%	4.90%	5.47%
22	Great Plains Energy	5.31%	N/A	N/A	N/A	N/A	N/A	4.78%	4.27%	4.21%	4.02%	3.91%	3.93%	3.84%	3.90%	4.03%	7.76%	9.13%	9.94%
23	Hawaiian Elec.	7.21%	6.96%	6.22%	6.17%	6.12%	6.24%	6.43%	6.51%	6.91%	7.10%	7.27%	7.62%	7.77%	7.91%	7.96%	8.08%	8.11%	9.22%
24	IDACORP, Inc.	4.65%	5.48%	5.45%	5.36%	5.24%	5.11%	5.02%	4.87%	4.70%	4.53%	4.26%	3.91%	3.62%	3.87%	4.11%	4.32%	4.48%	4.66%
25	NextEra Energy, Inc.	6.82%	8.61%	8.13%	7.51%	6.61%	6.22%	6.55%	6.69%	6.29%	6.49%	6.36%	6.34%	6.12%	5.82%	5.99%	6.30%	6.22%	6.21%
26	NorthWestern Corp	5.83%	5.65%	5.73%	5.84%	5.69%	5.70%	5.76%	5.77%	5.78%	5.08%	5.71%	5.90%	6.08%	6.01%	6.13%	6.21%	6.06%	6.00%
27	OGC Energy	6.82%	7.47%	8.04%	8.71%	7.28%	6.96%	6.59%	6.70%	6.30%	5.84%	5.56%	5.70%	5.81%	6.24%	6.79%	6.89%	7.47%	7.61%
28	Otter Tail Corp.	7.09%	5.64%	6.54%	7.05%	7.19%	7.29%	7.27%	7.34%	7.70%	7.86%	8.07%	8.25%	7.52%	6.77%	6.33%	6.22%	6.67%	6.90%
29	Pinnacle West Capital	6.20%	6.40%	6.43%	6.47%	6.29%	6.16%	6.03%	5.93%	5.91%	5.89%	5.84%	7.38%	6.00%	6.20%	6.42%	6.15%	5.98%	5.87%
30	PNM Resources	3.93%	5.52%	3.88%	5.23%	5.59%	5.12%	4.67%	4.18%	3.85%	3.37%	3.26%	2.89%	2.55%	2.84%	2.65%	3.20%	4.13%	3.89%
31	Portland General	4.85%	5.75%	5.61%	5.45%	5.24%	5.09%	4.94%	4.78%	4.64%	4.56%	4.70%	4.70%	4.78%	4.90%	4.93%	4.48%	4.42%	3.45%
32	PPL Corp.	8.71%	4.68%	8.89%	9.55%	9.74%	10.13%	10.18%	10.44%	10.19%	7.28%	7.43%	8.00%	7.48%	8.24%	9.47%	9.89%	8.20%	8.27%
33	Public Serv. Enterprise	6.95%	7.82%	7.12%	6.18%	6.28%	6.31%	6.27%	6.31%	6.03%	6.14%	6.28%	6.66%	6.75%	7.20%	7.66%	8.40%	8.15%	8.54%
34	SCANA Corp.	6.44%	N/A	N/A	N/A	N/A	N/A	6.67%	5.74%	5.72%	6.01%	6.14%	6.29%	6.48%	6.54%	6.80%	7.12%	6.94%	6.89%
35	Sempra Energy	5.33%	5.49%	5.56%	5.96%	6.39%	6.59%	6.53%	5.83%	5.89%	5.74%	5.60%	5.66%	4.68%	4.16%	4.27%	4.18%	3.89%	4.19%
36	Southern Co.	9.56%	9.67%	9.96%	9.59%	9.42%	9.95%	9.59%	9.59%	9.59%	9.48%	9.39%	9.22%	9.22%	9.38%	9.55%	9.74%	9.83%	10.07%
37	Vectren Corp.	7.71%	N/A	N/A	N/A	N/A	N/A	7.67%	7.60%	7.57%	7.51%	7.55%	7.57%	7.74%	7.78%	7.84%	7.85%	7.86%	7.97%
38	WEC Energy Group	6.30%	7.92%	7.83%	7.62%	7.36%	7.12%	6.94%	7.00%	6.35%	7.96%	7.71%	6.65%	6.05%	4.92%	4.42%	3.78%	3.77%	3.72%
39	Westar Energy	5.71%	N/A	N/A	N/A	N/A	N/A	5.82%	5.66%	5.57%	5.60%	5.70%	5.77%	5.81%	5.84%	5.83%	5.75%	5.64%	5.56%
40	Xcel Energy Inc.	6.16%	6.43%	6.38%	6.34%	6.42%	6.39%	6.38%	6.26%	6.13%	5.94%	5.78%	5.88%	5.91%	5.97%	6.09%	6.13%	6.19%	6.16%
41	Average	6.34%	6.47%	6.50%	6.69%	6.60%	6.72%	6.76%	6.48%	6.14%	6.10%	6.11%	6.29%	6.10%	6.06%	6.12%	6.36%	6.27%	6.06%
42	Median	6.06%	5.95%	6.34%	6.26%	6.32%	6.24%	6.27%	5.86%	5.81%	5.83%	5.82%	5.98%	6.06%	5.99%	5.99%	6.21%	6.21%	6.19%

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

<sup>a</sup> Based on the projected 2022 Dividend Declared per share and Book Value per share, published in The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Portland General Electric Company

Electric Utilities  
(Valuation Metrics)

Line	Company	Dividends to Earnings Ratio <sup>1</sup>																	
		17-Year																	
		Average	2022 <sup>2a</sup>	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	ALLETE	0.69	0.77	0.78	0.74	0.71	0.66	0.68	0.66	0.60	0.68	0.72	0.71	0.67	0.80	0.93	0.61	0.53	0.52
2	Alliant Energy	0.61	0.63	0.61	0.62	0.61	0.61	0.63	0.72	0.65	0.59	0.57	0.59	0.62	0.57	0.79	0.55	0.47	0.56
3	Ameren Corp.	0.67	0.57	0.57	0.57	0.57	0.56	0.64	0.64	0.70	0.67	0.76	0.66	0.63	0.56	0.55	0.88	0.85	0.95
4	American Electric Power	0.61	0.70	0.60	0.64	0.66	0.65	0.66	0.54	0.60	0.61	0.61	0.63	0.59	0.66	0.55	0.55	0.55	0.52
5	Avangrid, Inc.	0.88	0.76	0.89	0.94	0.78	0.91	1.03	0.87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	0.68	0.83	0.80	0.85	0.52	0.72	0.73	0.64	0.70	0.69	0.66	0.88	0.64	0.61	0.51	0.51	0.83	0.39
7	Black Hills	1.08	0.61	0.61	0.58	0.58	0.56	0.54	0.64	0.57	0.54	0.58	0.75	1.45	0.87	0.61	7.78	0.51	0.60
8	CenterPoint Energy	0.73	0.51	0.70	0.70	0.58	1.51	0.86	1.03	0.92	0.67	0.67	0.60	0.62	0.73	0.75	0.56	0.58	0.45
9	CMS Energy Corp.	0.57	0.65	0.67	0.62	0.64	0.62	0.61	0.63	0.61	0.62	0.61	0.63	0.58	0.50	0.54	0.29	0.31	N/A
10	Consol. Edison	0.69	0.69	0.65	0.78	0.73	0.63	0.67	0.68	0.64	0.70	0.63	0.63	0.67	0.69	0.75	0.70	0.67	0.78
11	Dominion Resources	0.86	0.65	0.79	1.90	1.68	1.03	0.86	0.81	0.81	0.79	0.73	0.77	0.71	0.63	0.66	0.52	0.69	0.58
12	DTE Energy	0.67	0.64	0.95	0.58	0.61	0.58	0.59	0.63	0.64	0.53	0.69	0.62	0.63	0.58	0.65	0.78	0.80	0.85
13	Duke Energy	0.81	0.76	0.79	0.97	0.74	0.88	0.83	0.91	0.79	0.76	0.78	0.82	0.72	0.72	0.83	0.89	0.72	N/A
14	Edison Int'l	0.46	1.78	1.35	1.50	0.62	- 1.93	0.50	0.50	0.42	0.34	0.36	0.29	0.40	0.38	0.38	0.33	0.35	0.34
15	El Paso Electric	0.50	N/A	N/A	N/A	N/A	0.68	0.54	0.51	0.57	0.49	0.48	0.43	0.27	N/A	N/A	N/A	N/A	N/A
16	Entergy Corp.	0.55	0.76	0.56	0.54	0.58	0.61	0.67	0.50	0.57	0.58	0.67	0.55	0.44	0.49	0.48	0.48	0.46	0.40
17	Eversource Energy	0.60	0.62	0.68	0.64	0.62	0.62	0.61	0.60	0.61	0.61	0.59	0.70	0.50	0.49	0.50	0.44	0.49	0.88
18	Evergy, Inc.	0.64	0.71	0.57	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.	0.60	0.60	0.88	0.59	0.48	0.67	0.47	0.70	0.49	0.59	0.63	1.09	0.56	0.54	0.49	0.50	0.45	0.47
20	FirstEnergy Corp.	0.79	0.65	0.58	0.84	0.83	1.37	0.53	0.69	0.72	1.69	0.56	1.03	1.17	0.68	0.66	0.50	0.49	0.48
21	Fortis Inc.	0.71	0.78	0.80	0.76	0.69	0.69	0.62	0.82	0.68	0.94	0.77	0.73	0.67	0.69	0.69	0.66	0.64	0.49
22	Great Plains Energy	- 0.82	N/A	N/A	N/A	N/A	N/A	-18.33	0.66	0.73	0.60	0.54	0.63	0.67	0.54	0.81	1.43	0.90	1.02
23	Hawaiian Elec.	0.83	0.64	0.60	0.73	0.64	0.67	0.76	0.54	0.83	0.76	0.77	0.74	0.86	1.02	1.36	1.16	1.12	0.93
24	IDACORP, Inc.	0.51	0.59	0.59	0.58	0.56	0.53	0.53	0.53	0.50	0.46	0.43	0.41	0.36	0.41	0.45	0.55	0.65	0.51
25	NextEra Energy, Inc.	0.56	0.59	0.85	0.67	0.64	0.66	0.60	0.60	0.51	0.52	0.55	0.53	0.45	0.42	0.47	0.44	0.50	0.47
26	NorthWestern Corp.	0.69	0.77	0.69	0.78	0.65	0.65	0.63	0.59	0.66	0.54	0.62	0.65	0.57	0.64	0.66	0.75	0.89	0.95
27	OGE Energy	0.58	0.73	0.69	0.76	0.67	0.66	0.66	0.68	0.62	0.48	0.44	0.45	0.44	0.49	0.54	0.56	0.52	0.55
28	Otter Tail Corp.	1.03	0.24	0.37	0.63	0.65	0.65	0.69	0.78	0.79	0.78	0.87	1.13	2.64	3.13	1.68	1.09	0.66	0.68
29	Pinnacle West Capital	0.70	0.80	0.61	0.66	0.64	0.63	0.61	0.65	0.62	0.65	0.61	0.76	0.70	0.68	0.93	0.99	0.71	0.64
30	PNM Resources	0.87	0.52	0.43	0.58	0.52	0.65	0.52	0.53	0.49	0.52	0.48	0.44	0.46	0.57	0.86	5.50	1.20	0.50
31	Portland General	0.62	0.65	0.63	0.92	0.64	0.60	0.59	0.58	0.58	0.51	0.62	0.57	0.54	0.62	0.77	0.70	0.40	0.59
32	PPL Corp.	0.79	0.62	3.13	0.81	0.70	0.64	0.75	0.54	0.63	0.63	0.62	0.55	0.54	0.61	1.16	0.55	0.46	0.48
33	Public Serv. Enterprise	0.54	0.62	0.80	0.54	0.48	0.65	0.61	0.58	0.47	0.49	0.59	0.58	0.44	0.45	0.43	0.44	0.45	0.62
34	SCANA Corp.	0.61	N/A	N/A	N/A	N/A	N/A	0.58	0.55	0.57	0.55	0.60	0.63	0.65	0.64	0.66	0.62	0.64	0.65
35	Sempra Energy	0.54	0.50	1.10	0.64	0.65	0.65	0.71	0.71	0.54	0.57	0.60	0.55	0.43	0.39	0.33	0.31	0.29	0.28
36	Southern Co.	0.75	0.75	0.77	0.78	0.78	0.79	0.72	0.79	0.76	0.75	0.73	0.73	0.76	0.75	0.74	0.70	0.73	0.78
37	Vectren Corp.	0.75	N/A	N/A	N/A	N/A	N/A	0.66	0.64	0.64	0.72	0.86	0.72	0.80	0.84	0.75	0.80	0.69	0.85
38	WEC Energy Group	0.56	0.65	0.66	0.67	0.66	0.66	0.66	0.67	0.74	0.60	0.58	0.51	0.48	0.42	0.42	0.36	0.35	0.35
39	Westar Energy	0.68	N/A	N/A	N/A	N/A	N/A	0.70	0.63	0.69	0.60	0.60	0.61	0.72	0.69	0.94	0.89	0.59	0.52
40	Xcel Energy Inc.	0.62	0.62	0.62	0.62	0.61	0.62	0.63	0.62	0.61	0.59	0.58	0.58	0.60	0.64	0.65	0.64	0.67	0.65
41	Average	0.66	0.68	0.78	0.76	0.67	0.64	0.17	0.66	0.64	0.64	0.62	0.66	0.67	0.68	0.70	0.97	0.62	0.61
42	Median	0.63	0.65	0.68	0.67	0.64	0.65	0.63	0.64	0.63	0.60	0.61	0.63	0.62	0.62	0.66	0.61	0.59	0.56

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Note:

<sup>a</sup> Based on the projected 2022 Dividends Declared per share and Earnings per share, published in The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Portland General Electric Company

Electric Utilities  
(Valuation Metrics)

Cash Flow to Capital Spending Ratio<sup>1</sup>

Line	Company	17-Year																	
		Average	2022 <sup>2a</sup>	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	ALLETE	0.88	2.12	0.55	0.55	0.63	1.22	1.61	1.32	1.16	0.45	0.67	0.49	0.77	0.63	0.39	0.46	0.65	1.23
2	Alliant Energy	0.81	0.91	0.95	N/A	N/A	N/A	0.49	N/A	0.81	0.91	1.01	0.57	0.91	0.67	0.39	0.57	1.04	1.27
3	Ameren Corp.	0.87	0.71	0.62	0.62	0.79	0.80	0.75	0.75	0.75	0.89	1.07	1.31	1.36	0.81	0.66	0.97	1.21	1.21
4	American Electric Power	0.87	0.81	0.81	0.81	0.75	0.68	0.67	0.85	0.85	0.87	0.91	1.07	1.19	1.24	1.02	0.70	0.77	0.75
5	Avangrid, Inc.	0.71	0.79	0.56	0.56	0.62	0.85	0.57	0.86	0.89	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Avista Corp.	0.89	0.73	0.88	0.88	0.92	0.78	0.77	0.84	0.76	0.80	0.86	0.80	0.90	0.99	1.15	0.97	0.73	1.36
7	Black Hills	0.66	0.86	0.61	0.61	0.53	0.87	1.17	0.71	0.64	0.70	0.74	0.71	0.40	0.41	0.61	0.35	0.76	0.55
8	CenterPoint Energy	1.00	0.44	0.73	0.73	0.83	0.98	1.22	1.12	0.92	1.20	1.18	1.37	1.12	0.88	0.99	1.16	0.98	1.08
9	CMS Energy Corp.	0.87	0.82	0.78	0.78	0.79	0.77	0.89	0.81	0.81	0.74	0.82	0.82	1.05	1.13	0.97	1.11	0.55	1.07
10	Consol. Edison	0.83	0.88	0.83	0.83	0.87	0.82	0.76	0.65	0.76	0.88	0.86	1.01	0.98	0.90	0.75	0.70	0.81	0.74
11	Dominion Resources	0.79	0.86	0.73	0.73	0.96	1.04	0.81	0.65	0.64	0.63	0.77	0.73	0.79	0.87	0.75	0.83	0.74	0.85
12	DTE Energy	0.98	0.77	0.74	0.74	0.83	0.84	0.94	0.93	0.84	1.02	0.96	0.93	1.09	1.51	1.50	0.98	1.07	1.03
13	Duke Energy	0.89	0.87	0.85	0.85	0.80	0.81	0.87	0.82	0.96	1.20	1.09	0.87	0.89	0.78	0.77	0.71	1.09	0.97
14	Edison Int'l	0.74	0.62	0.55	0.55	0.68	0.34	0.94	0.91	0.80	0.83	0.80	0.76	0.61	0.60	0.79	0.93	0.88	0.93
15	El Paso Electric	0.87	N/A	0.83	N/A	N/A	N/A	0.96	1.04	0.85	0.67	0.69	0.79	0.85	1.03	0.98	0.68	0.78	0.84
16	Entergy Corp.	0.96	0.62	0.74	0.74	0.79	0.73	0.76	1.08	1.05	1.19	1.03	0.88	1.15	1.24	1.02	0.93	1.14	1.13
17	Eversource Energy	0.85	0.89	0.80	0.80	0.75	0.83	0.79	0.87	0.91	0.90	1.13	0.86	0.80	1.05	0.96	0.77	0.68	0.67
18	Evergy, Inc.	0.90	0.78	1.03	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.	1.22	0.84	1.09	1.09	1.20	1.05	1.06	0.76	0.82	0.93	1.07	0.98	1.19	1.66	1.66	1.61	1.84	1.86
20	FirstEnergy Corp.	1.01	0.98	0.83	0.83	0.80	0.76	1.03	0.94	0.93	0.54	0.91	0.85	1.05	1.32	1.22	0.95	1.56	1.75
21	Fortis Inc.	0.69	0.89	0.65	0.65	0.68	0.72	0.76	0.76	0.65	0.60	0.77	0.72	0.66	0.68	0.63	0.66	0.57	0.63
22	Great Plains Energy	0.79	N/A	N/A	N/A	N/A	N/A	0.78	1.17	0.90	0.79	0.91	0.86	1.03	0.86	0.50	0.35	0.69	0.64
23	Hawaiian Elec.	1.12	1.56	1.27	1.27	1.08	0.85	0.81	1.37	0.98	1.03	0.92	0.99	1.30	1.50	0.79	0.87	1.15	1.23
24	IDACORP, Inc.	1.11	1.00	1.33	1.33	1.46	1.42	1.33	1.16	1.15	1.21	1.34	1.24	0.86	0.78	0.96	0.82	0.64	0.89
25	NextEra Energy, Inc.	0.61	0.55	0.58	0.58	0.67	0.56	0.53	0.63	0.71	0.77	0.68	0.39	0.58	0.69	0.60	0.63	0.56	0.73
26	NorthWestern Corp.	1.02	0.75	0.84	0.84	1.13	1.23	1.21	1.13	1.01	0.93	0.92	0.88	1.04	0.76	0.88	1.27	1.23	1.29
27	OGE Energy	0.91	0.87	1.24	1.24	1.27	1.30	0.81	1.00	1.18	1.19	0.69	0.63	0.51	0.69	0.61	0.60	0.79	0.84
28	Otter Tail Corp.	0.91	2.13	0.48	0.48	0.80	1.49	1.10	0.84	0.74	0.70	0.67	0.85	1.16	1.09	0.56	0.37	0.65	1.44
29	Pinnacle West Capital	0.95	0.89	0.91	0.91	1.03	1.06	0.76	0.81	0.92	0.97	0.87	0.96	0.91	0.97	1.06	0.86	0.99	1.28
30	PNM Resources	0.71	0.63	0.72	0.72	0.78	0.82	0.84	0.57	0.57	0.63	0.80	0.87	0.77	0.82	0.70	0.44	0.43	0.89
31	Portland General	0.84	0.86	0.78	0.78	1.03	1.00	1.07	0.88	0.80	0.47	0.59	1.28	1.25	0.81	0.44	0.77	0.72	0.78
32	PPL Corp.	0.97	1.05	0.90	0.90	0.98	0.93	0.82	1.00	0.72	0.75	0.69	0.91	1.07	1.11	1.07	1.25	1.13	1.18
33	Public Serv. Enterprise	1.11	1.05	1.13	1.13	1.08	0.70	0.64	0.61	0.80	1.04	0.93	0.96	1.30	1.23	1.41	1.34	1.64	1.94
34	SCANA Corp.	0.86	N/A	N/A	N/A	N/A	N/A	0.86	0.66	0.83	0.90	0.83	0.77	0.88	0.86	0.76	0.76	0.92	1.26
35	Sempra Energy	0.81	0.92	0.77	0.77	0.88	0.80	0.67	0.56	0.81	0.74	0.84	0.73	0.72	0.90	1.02	0.87	0.90	0.93
36	Southern Co.	0.90	0.97	0.99	0.99	0.88	0.83	0.90	0.77	0.88	0.80	0.86	0.93	0.94	0.93	0.78	0.87	0.91	1.00
37	Vectren Corp.	1.00	N/A	N/A	N/A	N/A	N/A	0.82	0.87	0.95	0.98	1.05	1.13	1.20	1.31	0.83	0.82	0.98	1.00
38	WEC Energy Group	0.99	1.09	0.97	0.97	0.91	0.90	0.92	1.20	0.97	1.37	1.42	1.30	1.02	0.97	0.89	0.61	0.56	0.69
39	Westar Energy	0.72	N/A	N/A	N/A	N/A	N/A	0.91	0.63	0.86	0.70	0.72	0.67	0.71	0.88	0.68	0.36	0.48	1.00
40	Xcel Energy Inc.	0.76	0.93	0.66	0.66	0.78	0.77	0.84	0.79	0.63	0.68	0.60	0.76	0.83	0.76	0.89	0.75	0.71	0.90
41	Average	0.89	0.93	0.83	0.82	0.88	0.89	0.89	0.87	0.85	0.86	0.88	0.88	0.95	0.97	0.86	0.80	0.89	1.06
42	Median	0.84	0.87	0.81	0.78	0.83	0.84	0.84	0.84	0.83	0.82	0.86	0.87	0.96	0.90	0.80	0.77	0.82	1.00

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, March 12, April 23, and May 14, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, March 11, April 22, and May 13, 2022.

<sup>2</sup> The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Notes:

<sup>6</sup> Based on the projected Cash Flow per share and Capital Spending per share published in The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

Portland General Electric Company

Natural Gas Utilities  
(Valuation Metrics)

		Price to Earnings (P/E) Ratio <sup>1</sup>																	
Line	Company	17-Year																	
		Average (1)	2022 <sup>2</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)
1	Atmos Energy	17.49	19.50	19.30	22.30	23.22	21.75	22.04	20.80	17.50	16.09	15.87	15.93	14.36	13.21	12.54	13.59	15.87	13.52
2	Chesapeake Utilities	19.20	24.70	26.30	21.57	24.74	22.94	27.84	21.77	19.15	17.70	15.62	14.81	14.16	12.21	14.20	14.15	16.72	17.85
3	New Jersey Resources	17.38	18.80	17.50	17.70	24.33	15.64	22.38	21.25	16.61	11.73	15.98	16.83	16.76	14.98	14.93	12.27	21.61	16.13
4	NiSource Inc.	19.70	17.20	19.50	18.67	21.32	19.34	NMF	23.18	37.34	22.74	18.89	17.87	19.36	15.33	14.34	12.07	18.82	19.16
5	Northwest Nat. Gas	20.75	18.40	17.60	24.96	30.85	26.63	NMF	26.92	23.69	20.69	19.38	21.08	19.02	16.97	15.17	18.08	16.74	15.85
6	ONE Gas Inc.	21.33	19.50	18.60	21.71	25.27	23.06	23.47	22.74	19.79	17.83	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	South Jersey Inds.	18.55	N/A	14.30	14.89	28.28	22.64	27.92	21.71	17.95	18.03	18.90	16.94	18.48	16.81	14.96	15.90	17.18	11.86
8	Southwest Gas	17.37	14.20	15.30	16.80	21.30	20.61	22.21	21.64	19.35	17.86	15.76	15.00	15.69	13.97	12.20	20.27	17.26	15.94
9	Spire Inc.	18.77	15.70	19.00	51.12	22.79	16.74	19.82	19.61	16.49	19.80	21.25	14.46	13.05	13.74	13.39	14.31	14.19	13.60
10	UGI Corp.	15.57	12.70	12.90	13.80	23.40	17.77	20.84	19.33	17.71	15.81	15.44	16.38	15.03	10.86	10.30	13.30	15.14	13.97
11	WGL Holdings Inc.	16.71	N/A	N/A	N/A	N/A	N/A	25.40	20.05	16.99	15.15	18.25	15.27	16.97	15.11	12.58	13.66	15.80	15.46
12	Average	18.33	17.86	18.03	22.35	24.55	20.71	23.55	21.73	20.23	17.58	17.53	16.46	16.29	14.32	13.46	14.76	16.91	15.33
13	Median	17.83	18.40	18.10	20.12	23.87	21.18	22.38	21.64	17.95	17.83	17.11	16.15	16.22	14.48	13.80	13.91	16.73	15.66

		Market Price to Cash Flow (MP/CF) Ratio <sup>1</sup>																	
Line	Company	17-Year																	
		Average (1)	2022 <sup>2</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)
14	Atmos Energy	9.21	11.87	10.99	13.11	13.35	12.02	11.99	11.36	9.30	8.79	7.72	7.02	6.87	6.15	5.76	6.48	7.44	6.36
15	Chesapeake Utilities	10.44	14.66	14.20	12.31	14.17	12.24	13.78	12.06	10.16	9.25	8.12	7.46	7.35	6.36	9.48	7.88	8.58	9.40
16	New Jersey Resources	11.97	11.55	11.56	11.10	15.98	11.44	14.45	13.94	11.71	8.95	11.29	12.29	12.71	11.32	11.34	9.15	13.76	11.01
17	NiSource Inc.	7.89	8.17	7.89	7.83	8.81	8.91	12.11	8.56	10.38	10.56	8.71	7.81	6.81	5.09	4.06	4.87	6.69	6.87
18	Northwest Nat. Gas	12.43	8.70	8.57	10.10	13.13	11.75	59.72	11.57	9.46	8.84	8.61	9.48	9.08	8.94	8.26	8.75	8.54	7.83
19	ONE Gas Inc.	10.56	9.95	9.32	10.85	12.75	11.85	11.89	11.10	9.19	8.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	South Jersey Inds.	10.57	N/A	9.26	7.54	12.38	10.72	12.33	10.88	10.70	10.57	11.57	10.95	11.98	10.78	9.57	10.38	11.23	8.32
21	Southwest Gas	6.49	7.39	6.87	7.05	8.92	9.32	9.10	7.41	6.56	6.35	5.94	5.55	5.60	4.91	3.84	4.89	5.42	5.28
22	Spire Inc.	9.72	8.34	7.55	14.01	11.27	9.60	10.39	10.32	8.47	12.03	13.76	8.80	8.08	8.12	8.58	8.95	8.46	8.46
23	UGI Corp.	7.99	7.20	9.56	7.39	12.95	9.01	10.09	9.02	8.47	7.49	6.55	6.30	7.51	6.02	5.74	7.11	7.92	7.48
24	WGL Holdings Inc.	9.17	N/A	N/A	N/A	N/A	N/A	12.92	11.36	9.59	8.46	9.83	9.03	9.52	8.34	7.17	7.68	8.39	7.81
25	Average	9.61	9.76	9.58	10.13	12.37	10.69	16.25	10.69	9.45	9.04	9.21	8.47	8.55	7.60	7.38	7.62	8.64	7.88
26	Median	8.70	8.70	9.29	10.47	12.85	11.08	12.11	11.10	9.46	8.84	8.66	8.31	7.80	7.24	7.71	7.78	8.42	7.82

		Market Price to Book Value (MP/BV) Ratio <sup>1</sup>																	
Line	Company	17-Year																	
		Average (1)	2022 <sup>2</sup> (2)	2021 (3)	2020 (4)	2019 (5)	2018 (6)	2017 (7)	2016 (8)	2015 (9)	2014 (10)	2013 (11)	2012 (12)	2011 (13)	2010 (14)	2009 (15)	2008 (16)	2007 (17)	2006 (18)
27	Atmos Energy	1.59	1.65	1.59	1.95	2.10	2.03	2.16	2.11	1.72	1.55	1.39	1.28	1.30	1.18	1.05	1.20	1.40	1.34
28	Chesapeake Utilities	2.07	2.68	2.77	2.27	2.69	2.50	2.51	2.28	2.19	2.12	1.83	1.66	1.61	1.40	1.37	1.64	1.84	1.85
29	New Jersey Resources	2.27	2.35	2.26	1.90	2.75	2.63	2.70	2.52	2.28	2.13	2.05	2.33	2.31	2.09	2.16	1.92	2.17	2.01
30	NiSource Inc.	1.55	1.92	1.86	1.95	2.09	1.92	1.96	1.84	1.95	1.94	1.58	1.37	1.15	0.92	0.69	0.94	1.16	1.19
31	Northwest Nat. Gas	1.85	1.56	1.45	1.98	2.38	2.35	2.41	1.92	1.63	1.59	1.56	1.72	1.70	1.78	1.73	1.96	2.05	1.69
32	ONE Gas Inc.	1.69	1.72	1.57	1.90	2.20	1.93	1.89	1.67	1.26	1.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	South Jersey Inds.	2.05	N/A	1.54	1.52	2.06	2.11	2.29	1.79	1.77	2.07	2.27	2.21	2.59	2.38	1.95	2.08	2.21	1.93
34	Southwest Gas	1.54	1.45	1.32	1.49	1.84	1.79	2.13	1.96	1.68	1.68	1.61	1.51	1.43	1.24	0.97	1.20	1.46	1.46
35	Spire Inc.	1.56	1.43	1.47	1.67	1.78	1.63	1.65	1.64	1.44	1.33	1.34	1.51	1.46	1.39	1.68	1.71	1.66	1.71
36	UGI Corp.	1.99	1.39	1.64	1.87	2.92	2.30	2.62	2.41	2.29	1.97	1.69	1.45	1.75	1.55	1.66	2.01	2.16	2.21
37	WGL Holdings Inc.	1.81	N/A	N/A	N/A	N/A	N/A	2.69	2.45	2.15	1.69	1.71	1.66	1.63	1.50	1.45	1.59	1.64	1.59
38	Average	1.82	1.80	1.75	1.85	2.28	2.12	2.27	2.05	1.85	1.74	1.70	1.67	1.69	1.54	1.47	1.62	1.78	1.70
39	Median	1.69	1.65	1.58	1.90	2.15	2.07	2.29	1.96	1.77	1.69	1.65	1.58	1.62	1.45	1.56	1.67	1.75	1.70

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, Feb 26, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, February 25, 2022

<sup>2</sup> The Value Line Investment Survey, February 24, 2023.

Notes:

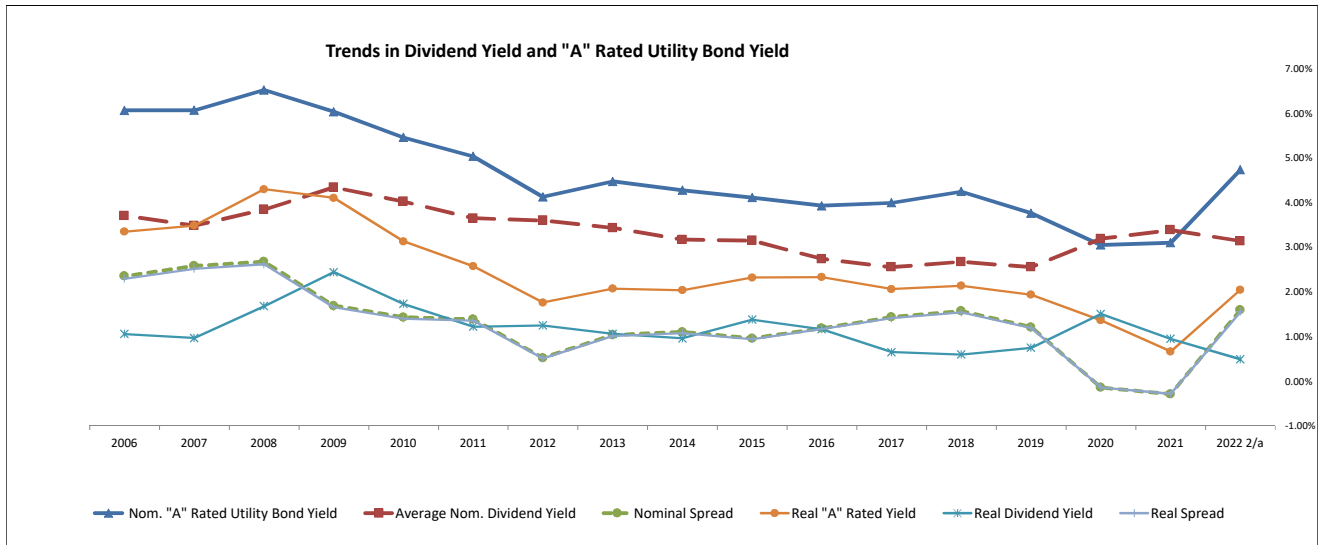
<sup>a</sup> Based on the average of the high and low price for year and the projected Cash Flow per share, published in The Value Line Investment Survey.

<sup>b</sup> Based on the average of the high and low price for the year and the projected Book Value per share, published in The Value Line Investment Survey.

Portland General Electric Company

Natural Gas Utilities  
(Valuation Metrics)

Line	Company	Dividend Yield <sup>1</sup>																	
		Average	2022 <sup>2a</sup>	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	Atmos Energy	3.40%	2.46%	2.63%	2.19%	2.08%	2.23%	2.27%	2.39%	2.88%	3.11%	3.53%	4.13%	4.19%	4.70%	5.34%	4.78%	4.16%	4.66%
2	Chesapeake Utilities	2.68%	1.61%	1.50%	1.86%	1.68%	1.76%	1.69%	1.91%	2.18%	2.44%	2.87%	3.25%	3.36%	3.91%	4.09%	4.10%	3.62%	3.76%
3	New Jersey Resources	3.22%	3.25%	3.50%	3.47%	2.50%	2.61%	2.69%	2.86%	3.14%	3.50%	3.71%	3.38%	3.33%	3.69%	3.46%	3.35%	3.02%	3.19%
4	NiSource Inc.	3.95%	3.33%	3.60%	3.41%	2.86%	3.10%	2.79%	2.76%	3.53%	2.69%	3.30%	3.84%	4.53%	5.66%	7.64%	5.69%	4.29%	4.21%
5	Northwest Nat. Gas	3.57%	3.86%	3.90%	3.33%	2.81%	3.05%	3.02%	3.28%	4.01%	4.14%	4.22%	3.83%	3.85%	3.63%	3.73%	3.27%	3.12%	3.73%
6	ONE Gas Inc.	2.60%	3.08%	3.21%	2.70%	2.25%	2.46%	2.37%	2.32%	2.71%	2.28%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	South Jersey Inds.	3.48%	N/A	4.88%	4.76%	3.66%	3.62%	3.20%	3.64%	3.95%	3.40%	3.14%	3.22%	2.81%	3.00%	3.43%	3.08%	2.81%	3.15%
8	Southwest Gas	2.93%	3.20%	3.65%	3.28%	2.60%	2.74%	2.46%	2.62%	2.87%	2.72%	2.69%	2.75%	2.78%	3.15%	4.01%	3.19%	2.56%	2.60%
9	Spire Inc.	3.78%	3.89%	3.79%	3.38%	2.95%	3.10%	3.09%	3.08%	3.53%	3.78%	3.96%	4.11%	4.31%	4.70%	3.91%	3.94%	4.43%	4.34%
10	UGI Corp.	2.90%	3.61%	3.25%	3.56%	2.16%	2.09%	2.01%	2.35%	2.50%	2.61%	3.01%	3.68%	3.30%	3.48%	3.23%	2.85%	2.69%	2.96%
11	WGL Holdings Inc.	3.91%	N/A	N/A	N/A	N/A	N/A	2.56%	2.94%	3.41%	4.24%	3.94%	3.89%	4.06%	4.37%	4.62%	4.22%	4.19%	4.48%
12	<b>Average</b>	<b>3.34%</b>	<b>3.14%</b>	<b>3.39%</b>	<b>3.19%</b>	<b>2.56%</b>	<b>2.68%</b>	<b>2.56%</b>	<b>2.74%</b>	<b>3.16%</b>	<b>3.17%</b>	<b>3.44%</b>	<b>3.61%</b>	<b>3.65%</b>	<b>4.03%</b>	<b>4.35%</b>	<b>3.85%</b>	<b>3.49%</b>	<b>3.71%</b>
13	Median	3.37%	3.25%	3.55%	3.35%	2.55%	2.68%	2.56%	2.76%	3.14%	3.11%	3.42%	3.75%	3.60%	3.80%	3.96%	3.65%	3.37%	3.75%
14	20-Yr Treasury Yields <sup>3</sup>	3.19%	3.30%	1.98%	1.35%	2.40%	3.02%	2.65%	2.23%	2.55%	3.07%	3.12%	2.54%	3.62%	4.03%	4.11%	4.36%	4.91%	4.99%
15	20-Yr TIPS <sup>3</sup>	1.03%	0.64%	-0.43%	-0.30%	0.60%	0.94%	0.75%	0.66%	0.78%	0.87%	0.75%	0.21%	1.19%	1.73%	2.21%	2.19%	2.36%	2.31%
16	Implied Inflation <sup>b</sup>	2.14%	2.64%	2.42%	1.66%	1.79%	2.06%	1.89%	1.56%	1.75%	2.19%	2.35%	2.33%	2.40%	2.26%	1.85%	2.13%	2.49%	2.62%
17	<b>Real Dividend Yield<sup>d</sup></b>	<b>1.17%</b>	<b>0.49%</b>	<b>0.95%</b>	<b>1.51%</b>	<b>0.75%</b>	<b>0.60%</b>	<b>0.65%</b>	<b>1.17%</b>	<b>1.38%</b>	<b>0.96%</b>	<b>1.06%</b>	<b>1.25%</b>	<b>1.22%</b>	<b>1.73%</b>	<b>2.45%</b>	<b>1.68%</b>	<b>0.97%</b>	<b>1.06%</b>
<b>Utility</b>																			
18	<b>Nominal "A" Rated Yield<sup>d</sup></b>	<b>4.65%</b>	<b>4.74%</b>	<b>3.10%</b>	<b>3.05%</b>	<b>3.77%</b>	<b>4.25%</b>	<b>4.00%</b>	<b>3.93%</b>	<b>4.12%</b>	<b>4.28%</b>	<b>4.48%</b>	<b>4.13%</b>	<b>5.04%</b>	<b>5.46%</b>	<b>6.04%</b>	<b>6.53%</b>	<b>6.07%</b>	<b>6.07%</b>
19	<b>Real "A" Rated Yield</b>	<b>2.46%</b>	<b>2.05%</b>	<b>0.67%</b>	<b>1.37%</b>	<b>1.94%</b>	<b>2.14%</b>	<b>2.07%</b>	<b>2.34%</b>	<b>2.33%</b>	<b>2.04%</b>	<b>2.08%</b>	<b>1.76%</b>	<b>2.58%</b>	<b>3.13%</b>	<b>4.11%</b>	<b>4.31%</b>	<b>3.49%</b>	<b>3.36%</b>
<b>Spreads (Utility Bond - Stock)</b>																			
20	<b>Nominal<sup>f</sup></b>	<b>1.31%</b>	<b>1.60%</b>	<b>-0.29%</b>	<b>-0.14%</b>	<b>1.21%</b>	<b>1.57%</b>	<b>1.44%</b>	<b>1.19%</b>	<b>0.96%</b>	<b>1.11%</b>	<b>1.04%</b>	<b>0.52%</b>	<b>1.39%</b>	<b>1.43%</b>	<b>1.69%</b>	<b>2.68%</b>	<b>2.59%</b>	<b>2.36%</b>
21	<b>Real<sup>g</sup></b>	<b>1.29%</b>	<b>1.56%</b>	<b>-0.28%</b>	<b>-0.14%</b>	<b>1.19%</b>	<b>1.54%</b>	<b>1.41%</b>	<b>1.17%</b>	<b>0.94%</b>	<b>1.08%</b>	<b>1.01%</b>	<b>0.51%</b>	<b>1.36%</b>	<b>1.40%</b>	<b>1.66%</b>	<b>2.62%</b>	<b>2.52%</b>	<b>2.30%</b>
<b>Spreads (Treasury Bond - Stock)</b>																			
22	<b>Nominal<sup>f</sup></b>	<b>-0.15%</b>	<b>0.16%</b>	<b>-1.41%</b>	<b>-1.84%</b>	<b>-0.15%</b>	<b>0.34%</b>	<b>0.09%</b>	<b>-0.52%</b>	<b>-0.61%</b>	<b>-0.10%</b>	<b>-0.32%</b>	<b>-1.06%</b>	<b>-0.03%</b>	<b>0.00%</b>	<b>-0.24%</b>	<b>0.51%</b>	<b>1.42%</b>	<b>1.28%</b>
23	<b>Real<sup>g</sup></b>	<b>-0.14%</b>	<b>0.15%</b>	<b>-1.38%</b>	<b>-1.81%</b>	<b>-0.15%</b>	<b>0.34%</b>	<b>0.09%</b>	<b>-0.51%</b>	<b>-0.60%</b>	<b>-0.10%</b>	<b>-0.31%</b>	<b>-1.04%</b>	<b>-0.03%</b>	<b>0.00%</b>	<b>-0.23%</b>	<b>0.50%</b>	<b>1.39%</b>	<b>1.25%</b>



Sources:

- <sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021. Data for the year 2020 was retrieved from Value Line Investment Surveys, Feb 26, 2021.
- <sup>2</sup> Data for the year 2021 was retrieved from Value Line Investment Surveys, February 25, 2022.
- <sup>3</sup> The Value Line Investment Survey, February 24, 2023.
- <sup>4</sup> St. Louis Federal Reserve: Economic Research, <http://research.stlouisfed.org>.
- <sup>5</sup> [www.moodys.com](http://www.moodys.com), Bond Yields and Key Indicators, through December 31, 2022.

Notes:

- <sup>a</sup> Based on the average of the high and low price for the year and the projected Dividends Declared per share published in the Value Line Investment Survey.
- <sup>b</sup> Line 16 = (1 + Line 14) / (1 + Line 15) - 1.
- <sup>c</sup> Line 17 = (1 + Line 12) / (1 + Line 16) - 1.
- <sup>d</sup> The spread being measured here is the nominal A-rated utility bond yield over the average nominal utility dividend yield; (Line 18 - Line 12).
- <sup>e</sup> The spread being measured here is the real A-rated utility bond yield over the average real utility dividend yield; (Line 19 - Line 17)
- <sup>f</sup> The spread being measured here is the nominal 20-Year Treasury yield over the average nominal utility dividend yield; (Line 14 - Line 12).
- <sup>g</sup> The spread being measured here is the real 20-Year TIPS yield over the average real utility dividend yield; (Line 15 - Line 17)



Portland General Electric Company

Natural Gas Utilities  
(Valuation Metrics)

Line	Company	Dividend per Share <sup>1</sup>																			
		17-Year																	2018	2017	
		Average	2022 <sup>2</sup>	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	CAGR	CAGR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)		
1	Atmos Energy	1.59	2.72	2.30	1.48	1.40	1.94	1.80	1.68	1.56	1.48	1.40	1.38	1.36	1.34	1.32	1.30	1.28	1.26	2.89%	3.30%
2	Chesapeake Utilities	1.10	2.03	1.69	1.07	1.01	1.39	1.26	1.19	1.12	1.07	1.01	0.96	0.91	0.87	0.83	0.81	0.78	0.77	3.97%	4.58%
3	New Jersey Resources	0.85	1.45	1.27	0.86	0.81	1.11	1.04	0.98	0.93	0.86	0.81	0.77	0.72	0.68	0.62	0.56	0.51	0.48	5.70%	7.28%
4	NiSource Inc.	0.89	0.94	0.84	1.02	0.98	0.78	0.70	0.64	0.83	1.02	0.98	0.94	0.92	0.92	0.92	0.92	0.92	0.92	-1.08%	-2.45%
5	Northwest Nat. Gas	1.76	1.93	1.91	1.85	1.83	1.89	1.88	1.87	1.86	1.85	1.83	1.79	1.75	1.68	1.60	1.52	1.44	1.39	2.05%	2.78%
6	ONE Gas Inc.	1.56	2.48	2.16	0.84	N/A	1.84	1.68	1.40	1.20	0.84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.58%	25.99%
7	South Jersey Inds.	0.85	N/A	1.19	0.96	0.90	1.13	1.10	1.06	1.02	0.96	0.90	0.83	0.75	0.68	0.61	0.56	0.51	0.46	6.11%	8.25%
8	Southwest Gas	1.44	2.48	2.26	1.46	1.32	2.08	1.98	1.80	1.62	1.46	1.32	1.18	1.06	1.00	0.95	0.90	0.86	0.82	6.33%	8.34%
9	Spire Inc.	1.82	2.74	2.49	1.76	1.70	2.25	2.10	1.96	1.84	1.76	1.70	1.66	1.61	1.57	1.53	1.49	1.45	1.40	3.18%	3.75%
10	UGI Corp.	0.80	1.41	1.32	0.79	0.74	1.02	0.96	0.93	0.89	0.79	0.74	0.71	0.68	0.60	0.52	0.50	0.48	0.46	5.47%	7.02%
11	WGL Holdings Inc.	1.63	N/A	N/A	1.72	1.66	N/A	2.02	1.93	1.83	1.72	1.66	1.59	1.55	1.50	1.47	1.41	1.37	1.35	N/A	3.77%
12	<b>Average</b>	<b>1.29</b>	<b>2.02</b>	<b>1.74</b>	<b>1.25</b>	<b>1.24</b>	<b>1.54</b>	<b>1.50</b>	<b>1.40</b>	<b>1.34</b>	<b>1.25</b>	<b>1.24</b>	<b>1.18</b>	<b>1.13</b>	<b>1.08</b>	<b>1.04</b>	<b>1.00</b>	<b>0.96</b>	<b>0.93</b>	<b>4.62%</b>	<b>6.60%</b>
13	<b>Industry Average Growth</b>	<b>5.52%</b>	<b>15.89%</b>	<b>38.90%</b>	<b>1.58%</b>	<b>-19.95%</b>	<b>2.76%</b>	<b>6.99%</b>	<b>5.03%</b>	<b>6.50%</b>	<b>1.58%</b>	<b>4.67%</b>	<b>4.35%</b>	<b>4.34%</b>	<b>4.47%</b>	<b>4.20%</b>	<b>3.83%</b>	<b>3.13%</b>			

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, Feb 26, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, February 25, 2022

<sup>2</sup> The Value Line Investment Survey, February 24, 2023.

Portland General Electric Company

Natural Gas Utilities  
(Valuation Metrics)

Line	Company	Earnings per Share <sup>1</sup>																	
		17-Year		2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
		Average	2022 <sup>2</sup>																
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)		
1	Atmos Energy	3.16	5.60	5.12	4.72	4.35	4.00	3.60	3.38	3.09	2.96	2.50	2.10	2.26	2.16	1.97	2.00	1.94	2.00
2	Chesapeake Utilities	2.63	4.75	4.70	4.21	3.72	3.45	2.68	2.86	2.68	2.47	2.26	1.99	1.91	1.82	1.43	1.39	1.29	1.15
3	New Jersey Resources	1.65	2.50	2.16	2.07	1.96	2.72	1.73	1.61	1.78	2.08	1.37	1.36	1.29	1.23	1.20	1.35	0.78	0.93
4	NiSource Inc.	1.17	1.45	1.35	1.32	1.31	1.30	0.39	1.00	0.63	1.67	1.57	1.37	1.05	1.06	0.84	1.34	1.14	1.14
5	Northwest Nat. Gas	2.14	2.60	2.50	2.30	2.19	2.33	-1.94	2.12	1.96	2.16	2.24	2.22	2.39	2.73	2.83	2.57	2.76	2.35
6	ONE Gas Inc.	3.15	4.05	3.85	3.68	3.51	3.25	3.02	2.65	2.24	2.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	South Jersey Inds.	1.36	N/A	1.65	1.68	1.12	1.38	1.23	1.34	1.44	1.57	1.52	1.52	1.45	1.35	1.19	1.14	1.05	1.23
8	Southwest Gas	2.92	3.50	3.80	4.14	3.94	3.68	3.62	3.18	2.92	3.01	3.11	2.86	2.43	2.27	1.94	1.39	1.95	1.98
9	Spire Inc.	2.98	3.95	4.96	1.44	3.52	4.33	3.43	3.24	3.16	2.35	2.02	2.79	2.86	2.43	2.92	2.64	2.31	2.37
10	UGI Corp.	1.90	2.50	2.96	2.67	2.28	2.74	2.29	2.05	2.01	1.92	1.59	1.17	1.37	1.59	1.57	1.33	1.18	1.10
11	WGL Holdings Inc.	2.56	N/A	N/A	N/A	N/A	N/A	3.11	3.27	3.16	2.68	2.31	2.68	2.25	2.27	2.53	2.44	2.09	1.94
12	<b>Average</b>	<b>2.30</b>	<b>3.43</b>	<b>3.31</b>	<b>2.82</b>	<b>2.79</b>	<b>2.92</b>	<b>2.11</b>	<b>2.43</b>	<b>2.28</b>	<b>2.27</b>	<b>2.05</b>	<b>2.01</b>	<b>1.93</b>	<b>1.89</b>	<b>1.84</b>	<b>1.76</b>	<b>1.65</b>	<b>1.62</b>
13	<b>Industry Average Growth</b>	<b>5.30%</b>	<b>3.88%</b>	<b>17.07%</b>	<b>1.18%</b>	<b>-4.39%</b>	<b>38.59%</b>	<b>-13.26%</b>	<b>6.50%</b>	<b>0.54%</b>	<b>10.67%</b>	<b>2.13%</b>	<b>4.13%</b>	<b>1.87%</b>	<b>2.61%</b>	<b>4.79%</b>	<b>6.67%</b>	<b>1.82%</b>	

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, Feb 26, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, February 25, 2022

<sup>2</sup> The Value Line Investment Survey, February 24, 2023.

# Portland General Electric Company

## Natural Gas Utilities (Valuation Metrics)

<u>Line</u>	<u>Company</u>	<u>Cash Flow / Capital Spending</u>					<u>3 - 5 yr<sup>4</sup></u>
		<u>2019<sup>1</sup></u> (1)	<u>2020<sup>2</sup></u> (2)	<u>2021<sup>3</sup></u> (3)	<u>2022<sup>4</sup></u> (4)	<u>2023<sup>4</sup></u> (5)	<u>Projection</u> (5)
1	Atmos Energy	0.53x	0.53x	0.53x	0.54x	0.54x	0.69x
2	Chesapeake Utilities	0.66x	0.64x	0.82x	0.96x	0.90x	0.96x
3	New Jersey Resources	1.41x	0.65x	0.72x	0.59x	0.72x	0.57x
4	NiSource Inc.	0.66x	0.65x	0.69x	0.56x	0.57x	0.59x
5	Northwest Nat. Gas	0.77x	0.75x	0.61x	0.61x	0.68x	0.76x
6	ONE Gas Inc.	0.78x	0.88x	0.86x	0.85x	0.88x	1.06x
7	South Jersey Inds.	0.48x	0.47x	0.49x	N/A	N/A	N/A
8	Southwest Gas	0.62x	0.53x	0.61x	0.84x	0.92x	0.90x
9	Spire Inc.	0.65x	0.65x	0.70x	0.80x	0.71x	0.93x
10	UGI Corp.	1.33x	1.54x	1.66x	1.42x	1.40x	1.43x
11	Average	0.79x	0.73x	0.77x	0.80x	0.81x	0.88x
12	Median	0.66x	0.65x	0.69x	0.80x	0.72x	0.90x

Sources:

<sup>1</sup> The Value Line Investment Survey, February 28, 2020.

<sup>2</sup> The Value Line Investment Survey, Feb 26, 2021.

<sup>3</sup> The Value Line Investment Survey, February 25, 2022

<sup>4</sup> The Value Line Investment Survey, February 24, 2023.

Notes:

Based on the projected Cash Flow per share and Capital Spending per share.

Portland General Electric Company

Natural Gas Utilities  
(Valuation Metrics)

Line	Company	Percent Dividends to Book Value <sup>1</sup>																	
		17-Year																	
		Average	2022 <sup>2/a</sup>	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)		
1	Atmos Energy	5.04%	4.07%	4.19%	4.26%	4.36%	4.53%	4.90%	5.04%	4.96%	4.81%	4.92%	5.28%	5.44%	5.55%	5.61%	5.75%	5.82%	6.25%
2	Chesapeake Utilities	5.15%	4.31%	4.15%	4.23%	4.53%	4.39%	4.23%	4.35%	4.78%	5.18%	5.25%	5.39%	5.42%	5.49%	5.60%	6.71%	6.66%	6.95%
3	New Jersey Resources	7.22%	7.63%	7.92%	6.60%	6.85%	6.87%	7.26%	7.21%	7.16%	7.45%	7.60%	7.86%	7.69%	7.72%	7.48%	6.42%	6.54%	6.40%
4	NiSource Inc.	5.63%	6.39%	6.69%	6.64%	5.99%	5.96%	5.46%	5.08%	6.89%	5.22%	5.22%	5.25%	5.19%	5.22%	5.25%	5.34%	4.97%	5.02%
5	Northwest Nat. Gas	6.50%	6.03%	5.66%	6.57%	6.69%	7.16%	7.27%	6.30%	6.53%	6.58%	6.59%	6.57%	6.55%	6.44%	6.43%	6.41%	6.39%	6.32%
6	ONE Gas Inc.	4.37%	5.30%	5.04%	5.14%	4.96%	4.73%	4.48%	3.88%	3.41%	2.44%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	South Jersey Inds.	6.99%	N/A	7.53%	7.21%	7.53%	7.63%	7.34%	6.53%	6.98%	7.04%	7.12%	7.09%	7.26%	7.13%	6.69%	6.40%	6.22%	6.09%
8	Southwest Gas	4.44%	4.64%	4.80%	4.87%	4.79%	4.90%	5.25%	5.14%	4.82%	4.57%	4.33%	4.16%	3.98%	3.90%	3.89%	3.83%	3.74%	3.80%
9	Spire Inc.	5.87%	5.58%	5.56%	5.63%	5.25%	5.06%	5.09%	5.06%	5.07%	5.04%	5.31%	6.22%	6.30%	6.53%	6.56%	6.74%	7.33%	7.43%
10	UGI Corp.	5.59%	5.02%	5.34%	6.65%	6.30%	4.82%	5.28%	5.65%	5.72%	5.14%	5.07%	5.35%	5.77%	5.41%	5.35%	5.72%	5.82%	6.54%
11	WGL Holdings Inc.	6.86%	N/A	N/A	N/A	N/A	N/A	6.88%	7.21%	7.33%	7.14%	6.73%	6.45%	6.60%	6.57%	6.72%	6.88%	7.13%	
12	Average	5.82%	5.44%	5.69%	5.78%	5.72%	5.60%	5.77%	5.59%	5.78%	5.51%	5.82%	5.96%	6.02%	6.00%	5.96%	6.00%	6.04%	6.19%
13	Median	5.72%	5.30%	5.45%	6.10%	5.62%	4.98%	5.28%	5.14%	5.72%	5.18%	5.28%	5.80%	6.03%	5.99%	6.02%	6.41%	6.30%	6.36%

Line	Company	Dividends to Earnings Ratio <sup>1</sup>																	
		17-Year																	
		Average	2022 <sup>2/a</sup>	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)		
14	Atmos Energy	0.56	0.49	0.49	0.49	0.48	0.49	0.50	0.50	0.50	0.50	0.56	0.66	0.60	0.62	0.67	0.65	0.66	0.63
15	Chesapeake Utilities	0.48	0.43	0.39	0.40	0.42	0.40	0.47	0.42	0.42	0.43	0.45	0.48	0.48	0.48	0.58	0.58	0.61	0.67
16	New Jersey Resources	0.55	0.58	0.63	0.61	0.61	0.41	0.60	0.61	0.52	0.41	0.59	0.57	0.56	0.55	0.52	0.41	0.65	0.51
17	NiSource Inc.	0.82	0.65	0.65	0.64	0.61	0.60	0.61	0.60	1.32	0.61	0.62	0.69	0.88	0.87	1.10	0.69	0.81	0.81
18	Northwest Nat. Gas	0.65	0.74	0.77	0.83	0.87	0.81	0.97	0.88	0.95	0.86	0.82	0.81	0.73	0.62	0.57	0.59	0.52	0.59
19	ONE Gas Inc.	0.55	0.61	0.60	0.59	0.57	0.57	0.56	0.53	0.54	0.41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	South Jersey Inds.	0.65	N/A	0.74	0.71	1.04	0.82	0.89	0.79	0.71	0.61	0.59	0.54	0.52	0.50	0.51	0.49	0.48	0.37
21	Southwest Gas	0.52	0.71	0.63	0.55	0.55	0.57	0.55	0.57	0.55	0.49	0.42	0.41	0.44	0.44	0.49	0.65	0.44	0.41
22	Spire Inc.	0.68	0.69	0.52	1.73	0.67	0.52	0.61	0.60	0.58	0.75	0.84	0.59	0.56	0.65	0.52	0.56	0.63	0.59
23	UGI Corp.	0.45	0.56	0.46	0.49	0.50	0.37	0.42	0.45	0.44	0.41	0.46	0.60	0.50	0.38	0.33	0.38	0.41	0.41
24	WGL Holdings Inc.	0.64	N/A	N/A	N/A	N/A	N/A	0.65	0.59	0.58	0.64	0.72	0.59	0.69	0.66	0.58	0.58	0.65	0.69
25	Average	0.59	0.61	0.59	0.70	0.63	0.55	0.55	0.60	0.65	0.56	0.61	0.59	0.59	0.58	0.59	0.56	0.59	0.57
26	Median	0.59	0.61	0.61	0.60	0.59	0.54	0.56	0.59	0.55	0.50	0.59	0.56	0.58	0.54	0.58	0.58	0.62	0.59

Line	Company	Cash Flow to Capital Spending Ratio <sup>1</sup>																	
		17-Year																	
		Average	2022 <sup>2/a</sup>	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)		
27	Atmos Energy	0.65	0.54	0.58	0.52	0.53	0.55	0.62	0.59	0.60	0.65	0.55	0.59	0.68	0.77	0.78	0.81	0.94	0.82
28	Chesapeake Utilities	0.75	0.96	0.81	0.78	0.62	0.39	0.50	0.50	0.53	0.71	0.65	0.79	1.12	1.10	1.14	0.83	0.82	0.45
29	New Jersey Resources	1.22	0.59	0.62	0.71	0.51	0.85	0.70	0.59	0.67	1.79	1.46	1.48	1.51	1.55	1.75	2.11	1.67	2.14
30	NiSource Inc.	0.75	0.56	0.68	0.66	0.61	0.58	0.41	0.59	0.53	0.56	0.57	0.65	0.75	1.11	1.06	0.94	1.11	1.37
31	Northwest Nat. Gas	0.92	0.61	0.68	0.66	0.69	0.71	1.14	1.01	1.12	1.15	0.98	1.01	1.33	0.55	1.02	1.35	1.21	1.34
32	ONE Gas Inc.	0.86	0.85	0.86	0.83	0.89	0.84	0.87	0.92	0.86	0.79	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	South Jersey Inds.	0.82	N/A	0.55	0.54	0.40	0.73	0.81	0.76	0.50	0.53	0.51	0.58	0.70	0.75	1.01	1.67	1.70	1.40
34	Southwest Gas	0.86	0.84	0.86	0.69	0.53	0.56	0.68	0.83	0.84	0.99	1.05	0.90	0.82	1.37	1.28	0.85	0.78	0.72
35	Spire Inc.	1.05	0.80	0.75	0.42	0.44	0.77	0.72	0.96	0.92	0.98	0.78	0.95	1.53	1.61	1.93	1.64	1.42	1.28
36	UGI Corp.	1.46	1.42	1.32	1.59	1.22	1.64	1.29	1.35	1.48	1.53	1.32	1.52	1.28	1.36	1.52	1.72	1.62	1.69
37	WGL Holdings Inc.	1.02	N/A	N/A	N/A	N/A	N/A	0.61	0.56	0.60	0.63	0.71	0.93	1.02	1.60	1.60	1.60	1.17	1.18
38	Average	0.95	0.80	0.77	0.74	0.64	0.76	0.67	0.79	0.79	0.94	0.86	0.94	1.07	1.18	1.31	1.35	1.24	1.24
39	Median	0.79	0.80	0.72	0.67	0.57	0.72	0.68	0.76	0.67	0.79	0.74	0.92	1.07	1.23	1.21	1.48	1.19	1.31

Sources:

<sup>1</sup> Data for years 2019 and prior were retrieved from the Value Line Investment Survey Investment Analyzer Software, downloaded on June 18, 2021.

Data for the year 2020 was retrieved from Value Line Investment Surveys, Feb 26, 2021.

Data for the year 2021 was retrieved from Value Line Investment Surveys, February 25, 2022

<sup>2</sup> The Value Line Investment Survey, February 24, 2023.

Notes:

<sup>a</sup> Based on the projected Dividends Declared per share and Book Value per share, published in The Value Line Investment Survey.

<sup>b</sup> Based on the projected Dividends Declared per share and Earnings per share, published in The Value Line Investment Survey.

<sup>c</sup> Based on the projected Cash Flow per share and Capital Spending per share, published in The Value Line Investment Survey.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/103**

**PROXY GROUP**

## Portland General Electric Company

### Proxy Group

<u>Line</u>	<u>Company</u>	<u>Credit Ratings<sup>1</sup></u>		<u>Common Equity Ratios</u>	
		<u>S&amp;P</u> (1)	<u>Moody's</u> (2)	<u>MI<sup>1</sup></u> (3)	<u>Value Line<sup>2</sup></u> (4)
1	ALLETE, Inc.	BBB	Baa1	48.8%	57.8%
2	Alliant Energy Corporation	A-	Baa2	43.1%	47.1%
3	American Electric Power Company, Inc.	A-	Baa2	37.5%	41.7%
4	Ameren Corporation	BBB+	Baa1	41.4%	43.3%
5	Avista Corporation	BBB	Baa2	45.3%	52.5%
6	Black Hills Corporation	BBB+	Baa2	37.5%	40.3%
7	CMS Energy Corporation	BBB+	Baa2	32.5%	34.2%
8	CenterPoint Energy, Inc.	BBB+	Baa2	33.7%	34.5%
9	Dominion Energy, Inc.	BBB+	Baa2	36.5%	38.5%
10	Duke Energy Corporation	BBB+	Baa2	39.6%	43.1%
11	Edison International	BBB	Baa2	29.4%	33.2%
12	Entergy Corporation	BBB+	Baa2	29.6%	31.7%
13	Evergy, Inc.	A-	Baa2	45.0%	49.9%
14	Exelon Corporation	BBB+	Baa2	49.4%	49.1%
15	IDACORP, Inc.	BBB	Baa2	57.1%	57.2%
16	NextEra Energy, Inc.	A-	Baa1	36.7%	42.2%
17	NorthWestern Corporation	BBB	Baa2	47.8%	47.8%
18	OGE Energy Corp.	BBB+	Baa1	44.7%	47.4%
19	Otter Tail Corporation	BBB	Baa2	53.1%	57.4%
20	Pinnacle West Capital Corporation	BBB+	Baa1	41.6%	46.1%
21	Public Service Enterprise Group Incorporated	BBB+	Baa2	42.3%	48.7%
22	Sempra Energy	BBB+	Baa2	47.5%	53.3%
23	Southern Company	BBB+	Baa2	31.7%	35.6%
24	WEC Energy Group, Inc.	A-	Baa1	40.8%	44.6%
25	Xcel Energy Inc.	A-	Baa1	38.6%	41.8%
26	<b>Average</b>	<b>BBB+</b>	<b>Baa2</b>	<b>41.2%</b>	<b>44.8%</b>
27	<b>Median</b>			<b>41.4%</b>	<b>44.6%</b>
28	<b>Portland General Electric Company<sup>3,4</sup></b>	<b>BBB+</b>	<b>A3</b>		<b>50.0%</b>

Sources:

Note: If credit rating/common equity ratio unavailable for utility, subsidiary data used.

<sup>1</sup> S&P Global Market Intelligence, Downloaded on May 12, 2023.

<sup>2</sup> *The Value Line Investment Survey*, March 10, April 21, and May 12, 2023.

<sup>3</sup> S&P Global Market Intelligence, Downloaded on May 12, 2023.

<sup>4</sup> UE 416 / PGE / 1000, Liddle – Villadsen / 2, Table 1.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/104  
ANALYST GROWTH RATES**

## Portland General Electric Company

### Consensus Analysts' Growth Rates

Line	Company	Zacks		MI		Yahoo! Finance		Average of Growth Rates
		Estimated Growth % <sup>1</sup>	Number of Estimates	Estimated Growth % <sup>2</sup>	Number of Estimates	Estimated Growth % <sup>3</sup>	Number of Estimates	
		(1)	(2)	(3)	(4)	(5)	(6)	
1	ALLETE, Inc.	8.19%	N/A	5.67%	3	8.20%	N/A	7.35%
2	Alliant Energy Corporation	6.43%	N/A	6.19%	5	6.10%	N/A	6.24%
3	American Electric Power Company, Inc.	5.73%	N/A	6.03%	10	5.35%	N/A	5.70%
4	Ameren Corporation	6.97%	N/A	7.32%	6	6.90%	N/A	7.06%
5	Avista Corporation	6.35%	N/A	5.86%	4	6.30%	N/A	6.17%
6	Black Hills Corporation	2.20%	N/A	4.43%	3	5.40%	N/A	4.01%
7	CMS Energy Corporation	7.50%	N/A	7.76%	5	7.75%	N/A	7.67%
8	CenterPoint Energy, Inc.	7.41%	N/A	6.22%	6	- 1.07%	N/A	6.82%
9	Dominion Energy, Inc.	20.00%	N/A	0.82%	4	5.60%	N/A	8.81%
10	Duke Energy Corporation	6.18%	N/A	5.65%	9	5.80%	N/A	5.88%
11	Edison International	3.90%	N/A	5.76%	8	7.00%	N/A	5.55%
12	Entergy Corporation	2.84%	N/A	6.78%	5	6.60%	N/A	5.41%
13	Evergy, Inc.	5.20%	N/A	5.30%	4	2.67%	N/A	4.39%
14	Exelon Corporation	6.70%	N/A	6.41%	5	6.30%	N/A	6.47%
15	IDACORP, Inc.	3.68%	N/A	4.39%	4	3.70%	N/A	3.92%
16	NextEra Energy, Inc.	8.38%	N/A	8.86%	8	8.80%	N/A	8.68%
17	NorthWestern Corporation	6.76%	N/A	4.81%	6	4.50%	N/A	5.36%
18	OGE Energy Corp.	17.89%	N/A	1.27%	3	-12.34%	N/A	9.58%
19	Otter Tail Corporation	N/A	N/A	6.75%	2	9.00%	N/A	7.88%
20	Pinnacle West Capital Corporation	5.41%	N/A	5.65%	4	7.05%	N/A	6.04%
21	Public Service Enterprise Group Incorporated	4.33%	N/A	5.87%	8	4.30%	N/A	4.83%
22	Sempra Energy	4.80%	N/A	5.60%	6	4.14%	N/A	4.85%
23	Southern Company	4.00%	N/A	5.80%	5	7.30%	N/A	5.70%
24	WEC Energy Group, Inc.	5.76%	N/A	6.27%	5	5.50%	N/A	5.84%
25	Xcel Energy Inc.	6.62%	N/A	6.07%	6	6.40%	N/A	6.36%
26	<b>Average</b>	<b>6.80%</b>	<b>N/A</b>	<b>5.66%</b>	<b>5</b>	<b>6.12%</b>	<b>N/A</b>	<b>6.26%</b>
27	<b>Median</b>							<b>6.04%</b>

Sources:

<sup>1</sup> Zacks, <http://www.zacks.com/>, downloaded on May 12, 2023.

<sup>2</sup> S&P Global Market Intelligence, <https://platform.mi.spglobal.com>, downloaded on May 12, 2023.

<sup>3</sup> Yahoo! Finance, <http://www.finance.yahoo.com/>, downloaded on May 12, 2023.

-Negative growth rates excluded.



**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/105**

**CONSTANT GROWTH DCF**

## Portland General Electric Company

### Constant Growth DCF Model (Consensus Analysts' Growth Rates)

<u>Line</u>	<u>Company</u>	<u>13-Week AVG Stock Price</u> <sup>1</sup> (1)	<u>Analysts' Growth</u> <sup>2</sup> (2)	<u>Annualized Dividend</u> <sup>3</sup> (3)	<u>Adjusted Yield</u> (4)	<u>Constant Growth DCF</u> (5)
1	ALLETE, Inc.	\$62.64	7.35%	\$2.71	4.64%	12.00%
2	Alliant Energy Corporation	\$53.29	6.24%	\$1.81	3.61%	9.85%
3	American Electric Power Company, Inc.	\$91.07	5.70%	\$3.32	3.85%	9.56%
4	Ameren Corporation	\$86.47	7.06%	\$2.52	3.12%	10.18%
5	Avista Corporation	\$42.34	6.17%	\$1.84	4.61%	10.78%
6	Black Hills Corporation	\$63.42	4.01%	\$2.50	4.10%	8.11%
7	CMS Energy Corporation	\$60.81	7.67%	\$1.95	3.45%	11.12%
8	CenterPoint Energy, Inc.	\$29.39	6.82%	\$0.72	2.62%	9.43%
9	Dominion Energy, Inc.	\$56.21	8.81%	\$2.67	5.17%	13.97%
10	Duke Energy Corporation	\$96.97	5.88%	\$4.02	4.39%	10.27%
11	Edison International	\$69.92	5.55%	\$2.95	4.46%	10.01%
12	Entergy Corporation	\$106.41	5.41%	\$4.28	4.24%	9.65%
13	Evergy, Inc.	\$60.84	4.39%	\$2.45	4.20%	8.59%
14	Exelon Corporation	\$41.87	6.47%	\$1.44	3.66%	10.13%
15	IDACORP, Inc.	\$107.14	3.92%	\$3.16	3.07%	6.99%
16	NextEra Energy, Inc.	\$75.74	8.68%	\$1.87	2.68%	11.36%
17	NorthWestern Corporation	\$57.97	5.36%	\$2.56	4.65%	10.01%
18	OGE Energy Corp.	\$36.97	9.58%	\$1.66	4.91%	14.49%
19	Otter Tail Corporation	\$71.66	7.88%	\$1.65	2.48%	10.36%
20	Pinnacle West Capital Corporation	\$77.50	6.04%	\$3.46	4.73%	10.77%
21	Public Service Enterprise Group Incorporated	\$61.39	4.83%	\$2.28	3.89%	8.73%
22	Sempra Energy	\$152.14	4.85%	\$4.76	3.28%	8.13%
23	Southern Company	\$69.20	5.70%	\$2.80	4.28%	9.98%
24	WEC Energy Group, Inc.	\$93.55	5.84%	\$3.12	3.53%	9.37%
25	Xcel Energy Inc.	\$67.70	6.36%	\$2.08	3.27%	9.63%
26	<b>Average</b>	<b>\$71.70</b>	<b>6.26%</b>	<b>\$2.58</b>	<b>3.88%</b>	<b>10.14%</b>
27	<b>Median</b>					<b>10.01%</b>

Sources:

<sup>1</sup> S&P Global Market Intelligence, Downloaded on May 12, 2023.

<sup>2</sup> AWEC-CUB/104

<sup>3</sup> *The Value Line Investment Survey*, March 10, April 21, and May 12, 2023.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/106  
PAYOUT RATIOS**

## Portland General Electric Company

### Payout Ratios

<u>Line</u>	<u>Company</u>	<u>Dividends Per Share</u>		<u>Earnings Per Share</u>		<u>Payout Ratio</u>	
		<u>2021</u> (1)	<u>Projected</u> (2)	<u>2021</u> (3)	<u>Projected</u> (4)	<u>2021</u> (5)	<u>Projected</u> (6)
1	ALLETE, Inc.	\$2.52	\$3.00	\$3.23	\$5.00	78.02%	60.00%
2	Alliant Energy Corporation	\$1.61	\$2.29	\$2.63	\$3.80	61.22%	60.26%
3	American Electric Power Company, Inc.	\$3.00	\$4.16	\$4.96	\$6.80	60.48%	61.18%
4	Ameren Corporation	\$2.20	\$3.30	\$3.84	\$5.50	57.29%	60.00%
5	Avista Corporation	\$1.69	\$2.15	\$2.10	\$3.00	80.48%	71.67%
6	Black Hills Corporation	\$2.29	\$3.07	\$3.74	\$5.25	61.23%	58.48%
7	CMS Energy Corporation	\$1.74	\$2.30	\$2.58	\$3.75	67.44%	61.33%
8	CenterPoint Energy, Inc.	\$0.66	\$0.95	\$0.94	\$1.85	70.21%	51.35%
9	Dominion Energy, Inc.	\$2.52	\$3.18	\$3.86	\$5.00	65.28%	63.60%
10	Duke Energy Corporation	\$3.90	\$4.30	\$5.24	\$7.00	74.43%	61.43%
11	Edison International	\$2.69	\$3.65	\$2.00	\$6.45	134.50%	56.59%
12	Entergy Corporation	\$3.86	\$5.00	\$6.87	\$6.50	56.19%	76.92%
13	Evergy, Inc.	\$2.18	\$3.05	\$3.83	\$4.85	56.92%	62.89%
14	Exelon Corporation	\$1.53	\$1.80	\$2.82	\$3.00	54.26%	60.00%
15	IDACORP, Inc.	\$2.88	\$4.15	\$4.85	\$6.30	59.38%	65.87%
16	NextEra Energy, Inc.	\$1.54	\$2.74	\$2.55	\$4.40	60.39%	62.27%
17	NorthWestern Corporation	\$2.48	\$2.76	\$3.50	\$4.15	70.86%	66.51%
18	OGE Energy Corp.	\$1.63	\$1.85	\$2.36	\$3.15	69.07%	58.73%
19	Otter Tail Corporation	\$1.56	\$2.20	\$4.23	\$3.65	36.88%	60.27%
20	Pinnacle West Capital Corporation	\$3.36	\$3.75	\$5.47	\$5.70	61.43%	65.79%
21	Public Service Enterprise Group Incorporated	\$2.04	\$2.80	\$3.65	\$4.50	55.89%	62.22%
22	Sempra Energy	\$4.40	\$6.10	\$8.43	\$12.00	52.19%	50.83%
23	Southern Company	\$2.62	\$3.10	\$3.42	\$5.15	76.61%	60.19%
24	WEC Energy Group, Inc.	\$2.71	\$3.80	\$4.11	\$5.90	65.94%	64.41%
25	Xcel Energy Inc.	\$1.83	\$2.66	\$2.96	\$4.25	61.82%	62.59%
26	<b>Average</b>	<b>\$2.38</b>	<b>\$3.12</b>	<b>\$3.77</b>	<b>\$5.08</b>	<b>65.94%</b>	<b>61.82%</b>

Source:  
The Value Line Investment Survey, March 10, April 21, and May 12, 2023.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/107  
SUSTAINABLE GROWTH RATES**

## Portland General Electric Company

### Sustainable Growth Rate

Line	Company	3 to 5 Year Projections										Sustainable
		Dividends	Earnings	Book Value	Book Value	ROE	Adjustment	Adjusted	Payout	Retention	Internal	Growth
		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	ALLETE, Inc.	\$3.00	\$5.00	\$54.00	2.95%	9.26%	1.01	9.39%	60.00%	40.00%	3.76%	4.64%
2	Alliant Energy Corporation	\$2.29	\$3.80	\$31.90	4.92%	11.91%	1.02	12.20%	60.26%	39.74%	4.85%	5.38%
3	American Electric Power Company, Inc.	\$4.16	\$6.80	\$62.55	5.84%	10.87%	1.03	11.18%	61.18%	38.82%	4.34%	5.87%
4	Ameren Corporation	\$3.30	\$5.50	\$55.00	6.53%	10.00%	1.03	10.32%	60.00%	40.00%	4.13%	6.32%
5	Avista Corporation	\$2.15	\$3.00	\$36.75	3.36%	8.16%	1.02	8.30%	71.67%	28.33%	2.35%	3.53%
6	Black Hills Corporation	\$3.07	\$5.25	\$59.70	5.60%	8.79%	1.03	9.03%	58.48%	41.52%	3.75%	4.60%
7	CMS Energy Corporation	\$2.30	\$3.75	\$26.00	2.74%	14.42%	1.01	14.62%	61.33%	38.67%	5.65%	6.67%
8	CenterPoint Energy, Inc.	\$0.95	\$1.85	\$19.00	5.60%	9.74%	1.03	10.00%	51.35%	48.65%	4.87%	5.02%
9	Dominion Energy, Inc.	\$3.18	\$5.00	\$42.15	4.97%	11.86%	1.02	12.15%	63.60%	36.40%	4.42%	5.36%
10	Duke Energy Corporation	\$4.30	\$7.00	\$70.00	2.17%	10.00%	1.01	10.11%	61.43%	38.57%	3.90%	3.91%
11	Edison International	\$3.65	\$6.45	\$48.50	4.82%	13.30%	1.02	13.61%	56.59%	43.41%	5.91%	6.29%
12	Entergy Corporation	\$5.00	\$6.50	\$73.00	4.08%	8.90%	1.02	9.08%	76.92%	23.08%	2.10%	3.92%
13	Evergy, Inc.	\$3.05	\$4.85	\$47.50	2.77%	10.21%	1.01	10.35%	62.89%	37.11%	3.84%	3.87%
14	Exelon Corporation	\$1.80	\$3.00	\$28.75	- 3.29%	10.43%	0.98	10.26%	60.00%	40.00%	4.10%	4.17%
15	IDACORP, Inc.	\$4.15	\$6.30	\$67.00	4.04%	9.40%	1.02	9.59%	65.87%	34.13%	3.27%	4.10%
16	NextEra Energy, Inc.	\$2.74	\$4.40	\$30.00	7.96%	14.67%	1.04	15.23%	62.27%	37.73%	5.75%	7.92%
17	NorthWestern Corporation	\$2.76	\$4.15	\$52.30	3.21%	7.93%	1.02	8.06%	66.51%	33.49%	2.70%	3.48%
18	OGE Energy Corp.	\$1.85	\$3.15	\$26.00	4.24%	12.12%	1.02	12.37%	58.73%	41.27%	5.10%	5.11%
19	Otter Tail Corporation	\$2.20	\$3.65	\$34.25	6.22%	10.66%	1.03	10.98%	60.27%	39.73%	4.36%	5.12%
20	Pinnacle West Capital Corporation	\$3.75	\$5.70	\$61.75	2.82%	9.23%	1.01	9.36%	65.79%	34.21%	3.20%	3.69%
21	Public Service Enterprise Group Incorporated	\$2.80	\$4.50	\$35.00	3.39%	12.86%	1.02	13.07%	62.22%	37.78%	4.94%	4.94%
22	Sempra Energy	\$6.10	\$12.00	\$105.55	4.91%	11.37%	1.02	11.64%	50.83%	49.17%	5.72%	5.72%
23	Southern Company	\$3.10	\$5.15	\$32.25	4.16%	15.97%	1.02	16.29%	60.19%	39.81%	6.49%	6.79%
24	WEC Energy Group, Inc.	\$3.80	\$5.90	\$42.00	3.28%	14.05%	1.02	14.27%	64.41%	35.59%	5.08%	5.08%
25	Xcel Energy Inc.	\$2.66	\$4.25	\$38.25	4.90%	11.11%	1.02	11.38%	62.59%	37.41%	4.26%	4.91%
26	<b>Average</b>	<b>\$3.12</b>	<b>\$5.08</b>	<b>\$47.17</b>	<b>4.40%</b>	<b>11.09%</b>	<b>1.02</b>	<b>11.31%</b>	<b>61.82%</b>	<b>38.18%</b>	<b>4.35%</b>	<b>5.06%</b>
27	<b>Median</b>											<b>5.02%</b>

Sources and Notes:

Cols. (1), (2) and (3): *The Value Line Investment Survey*, March 10, April 21, and May 12, 2023.

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).

## Portland General Electric Company

### Sustainable Growth Rate

Line	Company	13-Week	2021	Market	Common Shares		Growth	S Factor <sup>3</sup>	V Factor <sup>4</sup>	S * V
		Average Stock Price <sup>1</sup>	Book Value Per Share <sup>2</sup>	to Book Ratio	Outstanding (in Millions) <sup>2</sup>					
		(1)	(2)	(3)	2021 (4)	3-5 Years (5)	(6)	(7)	(8)	(9)
1	ALLETE, Inc.	\$62.64	\$45.36	1.38	53.20	61.00	2.31%	3.19%	27.59%	0.88%
2	Alliant Energy Corporation	\$53.29	\$23.91	2.23	250.47	257.00	0.43%	0.96%	55.13%	0.53%
3	American Electric Power Company, Inc.	\$91.07	\$44.49	2.05	504.21	550.00	1.46%	2.99%	51.15%	1.53%
4	Ameren Corporation	\$86.47	\$37.64	2.30	257.70	285.00	1.69%	3.89%	56.47%	2.20%
5	Avista Corporation	\$42.34	\$30.14	1.40	71.50	85.00	2.92%	4.11%	28.81%	1.18%
6	Black Hills Corporation	\$63.42	\$43.05	1.47	64.74	72.00	1.79%	2.63%	32.12%	0.85%
7	CMS Energy Corporation	\$60.81	\$22.11	2.75	289.76	300.00	0.58%	1.60%	63.64%	1.02%
8	CenterPoint Energy, Inc.	\$29.39	\$13.70	2.15	628.92	634.00	0.13%	0.29%	53.38%	0.15%
9	Dominion Energy, Inc.	\$56.21	\$31.51	1.78	810.00	870.00	1.20%	2.14%	43.95%	0.94%
10	Duke Energy Corporation	\$96.97	\$61.55	1.58	769.00	770.00	0.02%	0.03%	36.53%	0.01%
11	Edison International	\$69.92	\$36.57	1.91	380.38	390.00	0.42%	0.80%	47.70%	0.38%
12	Entergy Corporation	\$106.41	\$57.42	1.85	202.65	230.00	2.13%	3.95%	46.04%	1.82%
13	Evergy, Inc.	\$60.84	\$40.32	1.51	229.30	230.00	0.05%	0.08%	33.73%	0.03%
14	Exelon Corporation	\$41.87	\$35.13	1.19	979.00	1,000.00	0.35%	0.42%	16.09%	0.07%
15	IDACORP, Inc.	\$107.14	\$52.82	2.03	50.52	53.00	0.80%	1.63%	50.70%	0.82%
16	NextEra Energy, Inc.	\$75.74	\$18.95	4.00	1,963.00	2,050.00	0.73%	2.90%	74.98%	2.17%
17	NorthWestern Corporation	\$57.97	\$43.28	1.34	54.06	62.00	2.31%	3.09%	25.34%	0.78%
18	OGE Energy Corp.	\$36.97	\$20.27	1.82	200.10	200.20	0.01%	0.02%	45.17%	0.01%
19	Otter Tail Corporation	\$71.66	\$23.84	3.01	41.55	42.50	0.38%	1.13%	66.73%	0.76%
20	Pinnacle West Capital Corporation	\$77.50	\$52.26	1.48	113.01	120.00	1.01%	1.49%	32.57%	0.49%
21	Public Service Enterprise Group Incorporated	\$61.39	\$28.65	2.14	504.00	500.00	- 0.13%	- 0.28%	53.33%	- 0.15%
22	Sempra Energy	\$152.14	\$79.17	1.92	316.92	300.00	- 0.91%	- 1.75%	47.96%	- 0.84%
23	Southern Company	\$69.20	\$26.30	2.63	1,060.00	1,070.00	0.19%	0.49%	61.99%	0.31%
24	WEC Energy Group, Inc.	\$93.55	\$34.60	2.70	315.43	315.43	0.00%	0.00%	63.01%	0.00%
25	Xcel Energy Inc.	\$67.70	\$28.70	2.36	544.03	560.00	0.48%	1.14%	57.61%	0.66%
26	<b>Average</b>	<b>\$71.70</b>	<b>\$37.27</b>	<b>2.04</b>	<b>426.14</b>	<b>440.29</b>	<b>0.93%</b>	<b>1.69%</b>	<b>46.87%</b>	<b>0.76%</b>

Sources and Notes:

<sup>1</sup> S&P Global Market Intelligence, Downloaded on May 12, 2023.

<sup>2</sup> *The Value Line Investment Survey*, March 10, April 21, and May 12, 2023.

<sup>3</sup> Expected Growth in the Number of Shares, Column (3) \* Column (6).

<sup>4</sup> Expected Profit of Stock Investment, [ 1 - 1 / Column (3) ].

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/108  
SUSTAINABLE GROWTH DCF**



## Portland General Electric Company

### Constant Growth DCF Model (Sustainable Growth Rate)

<u>Line</u>	<u>Company</u>	<u>13-Week AVG Stock Price<sup>1</sup></u> (1)	<u>Sustainable Growth<sup>2</sup></u> (2)	<u>Annualized Dividend<sup>3</sup></u> (3)	<u>Adjusted Yield</u> (4)	<u>Constant Growth DCF</u> (5)
1	ALLETE, Inc.	\$62.64	4.64%	\$2.71	4.53%	9.16%
2	Alliant Energy Corporation	\$53.29	5.38%	\$1.81	3.58%	8.95%
3	American Electric Power Company, Inc.	\$91.07	5.87%	\$3.32	3.86%	9.73%
4	Ameren Corporation	\$86.47	6.32%	\$2.52	3.10%	9.42%
5	Avista Corporation	\$42.34	3.53%	\$1.84	4.50%	8.03%
6	Black Hills Corporation	\$63.42	4.60%	\$2.50	4.12%	8.72%
7	CMS Energy Corporation	\$60.81	6.67%	\$1.95	3.42%	10.09%
8	CenterPoint Energy, Inc.	\$29.39	5.02%	\$0.72	2.57%	7.59%
9	Dominion Energy, Inc.	\$56.21	5.36%	\$2.67	5.00%	10.37%
10	Duke Energy Corporation	\$96.97	3.91%	\$4.02	4.31%	8.22%
11	Edison International	\$69.92	6.29%	\$2.95	4.49%	10.78%
12	Entergy Corporation	\$106.41	3.92%	\$4.28	4.18%	8.09%
13	Evergy, Inc.	\$60.84	3.87%	\$2.45	4.18%	8.05%
14	Exelon Corporation	\$41.87	4.17%	\$1.44	3.58%	7.76%
15	IDACORP, Inc.	\$107.14	4.10%	\$3.16	3.07%	7.17%
16	NextEra Energy, Inc.	\$75.74	7.92%	\$1.87	2.66%	10.58%
17	NorthWestern Corporation	\$57.97	3.48%	\$2.56	4.57%	8.05%
18	OGE Energy Corp.	\$36.97	5.11%	\$1.66	4.71%	9.82%
19	Otter Tail Corporation	\$71.66	5.12%	\$1.65	2.42%	7.54%
20	Pinnacle West Capital Corporation	\$77.50	3.69%	\$3.46	4.63%	8.32%
21	Public Service Enterprise Group Incorporated	\$61.39	4.94%	\$2.28	3.90%	8.84%
22	Sempra Energy	\$152.14	5.72%	\$4.76	3.31%	9.03%
23	Southern Company	\$69.20	6.79%	\$2.80	4.32%	11.11%
24	WEC Energy Group, Inc.	\$93.55	5.08%	\$3.12	3.50%	8.59%
25	Xcel Energy Inc.	\$67.70	4.91%	\$2.08	3.22%	8.14%
26	<b>Average</b>	<b>\$71.70</b>	<b>5.06%</b>	<b>\$2.58</b>	<b>3.83%</b>	<b>8.89%</b>
27	<b>Median</b>					<b>8.72%</b>

Sources:

<sup>1</sup> S&P Global Market Intelligence, Downloaded on May 12, 2023.

<sup>2</sup> AWEC-CUB/107, page 1.

<sup>3</sup> *The Value Line Investment Survey*, March 10, April 21, and May 12, 2023.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/109  
MULTI-STAGE DCF**

## Portland General Electric Company

### Multi-Stage Growth DCF Model

Line	Company	13-Week AVG	Annualized	First Stage	Second Stage Growth					Third Stage	Multi-Stage
		<u>Stock Price</u> <sup>1</sup>	<u>Dividend</u> <sup>2</sup>	<u>Growth</u> <sup>3</sup>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>	<u>Growth</u> <sup>4</sup>	<u>Growth DCF</u>
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	ALLETE, Inc.	\$62.64	\$2.71	7.35%	6.79%	6.23%	5.68%	5.12%	4.56%	4.00%	9.51%
2	Alliant Energy Corporation	\$53.29	\$1.81	6.24%	5.87%	5.49%	5.12%	4.75%	4.37%	4.00%	8.07%
3	American Electric Power Company, Inc.	\$91.07	\$3.32	5.70%	5.42%	5.13%	4.85%	4.57%	4.28%	4.00%	8.22%
4	Ameren Corporation	\$86.47	\$2.52	7.06%	6.55%	6.04%	5.53%	5.02%	4.51%	4.00%	7.68%
5	Avista Corporation	\$42.34	\$1.84	6.17%	5.81%	5.45%	5.09%	4.72%	4.36%	4.00%	9.16%
6	Black Hills Corporation	\$63.42	\$2.50	4.01%	4.01%	4.01%	4.01%	4.00%	4.00%	4.00%	8.10%
7	CMS Energy Corporation	\$60.81	\$1.95	7.67%	7.06%	6.45%	5.83%	5.22%	4.61%	4.00%	8.20%
8	CenterPoint Energy, Inc.	\$29.39	\$0.72	6.82%	6.35%	5.88%	5.41%	4.94%	4.47%	4.00%	7.05%
9	Dominion Energy, Inc.	\$56.21	\$2.67	8.81%	8.00%	7.20%	6.40%	5.60%	4.80%	4.00%	10.55%
10	Duke Energy Corporation	\$96.97	\$4.02	5.88%	5.56%	5.25%	4.94%	4.63%	4.31%	4.00%	8.84%
11	Edison International	\$69.92	\$2.95	5.55%	5.29%	5.04%	4.78%	4.52%	4.26%	4.00%	8.83%
12	Entergy Corporation	\$106.41	\$4.28	5.41%	5.17%	4.94%	4.70%	4.47%	4.23%	4.00%	8.57%
13	Evergy, Inc.	\$60.84	\$2.45	4.39%	4.32%	4.26%	4.19%	4.13%	4.06%	4.00%	8.29%
14	Exelon Corporation	\$41.87	\$1.44	6.47%	6.06%	5.65%	5.24%	4.82%	4.41%	4.00%	8.18%
15	IDACORP, Inc.	\$107.14	\$3.16	3.92%	3.94%	3.95%	3.96%	3.97%	3.99%	4.00%	7.04%
16	NextEra Energy, Inc.	\$75.74	\$1.87	8.68%	7.90%	7.12%	6.34%	5.56%	4.78%	4.00%	7.46%
17	NorthWestern Corporation	\$57.97	\$2.56	5.36%	5.13%	4.90%	4.68%	4.45%	4.23%	4.00%	8.99%
18	OGE Energy Corp.	\$36.97	\$1.66	9.58%	8.65%	7.72%	6.79%	5.86%	4.93%	4.00%	10.47%
19	Otter Tail Corporation	\$71.66	\$1.65	7.88%	7.23%	6.58%	5.94%	5.29%	4.65%	4.00%	7.07%
20	Pinnacle West Capital Corporation	\$77.50	\$3.46	6.04%	5.70%	5.36%	5.02%	4.68%	4.34%	4.00%	9.26%
21	Public Service Enterprise Group Incorporated	\$61.39	\$2.28	4.83%	4.69%	4.55%	4.42%	4.28%	4.14%	4.00%	8.07%
22	Sempra Energy	\$152.14	\$4.76	4.85%	4.71%	4.56%	4.42%	4.28%	4.14%	4.00%	7.43%
23	Southern Company	\$69.20	\$2.80	5.70%	5.42%	5.13%	4.85%	4.57%	4.28%	4.00%	8.68%
24	WEC Energy Group, Inc.	\$93.55	\$3.12	5.84%	5.54%	5.23%	4.92%	4.61%	4.31%	4.00%	7.90%
25	Xcel Energy Inc.	\$67.70	\$2.08	6.36%	5.97%	5.58%	5.18%	4.79%	4.39%	4.00%	7.71%
26	<b>Average</b>	<b>\$71.70</b>	<b>\$2.58</b>	<b>6.26%</b>	<b>5.89%</b>	<b>5.51%</b>	<b>5.13%</b>	<b>4.75%</b>	<b>4.38%</b>	<b>4.00%</b>	<b>8.37%</b>
27	<b>Median</b>										<b>8.20%</b>

Sources:

<sup>1</sup> S&P Global Market Intelligence, Downloaded on May 12, 2023.

<sup>2</sup> *The Value Line Investment Survey*, March 10, April 21, and May 12, 2023.

<sup>3</sup> AWEC-CUB/104

<sup>4</sup> *Blue Chip Economic Indicators March 10, 2023, at page 14.*

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

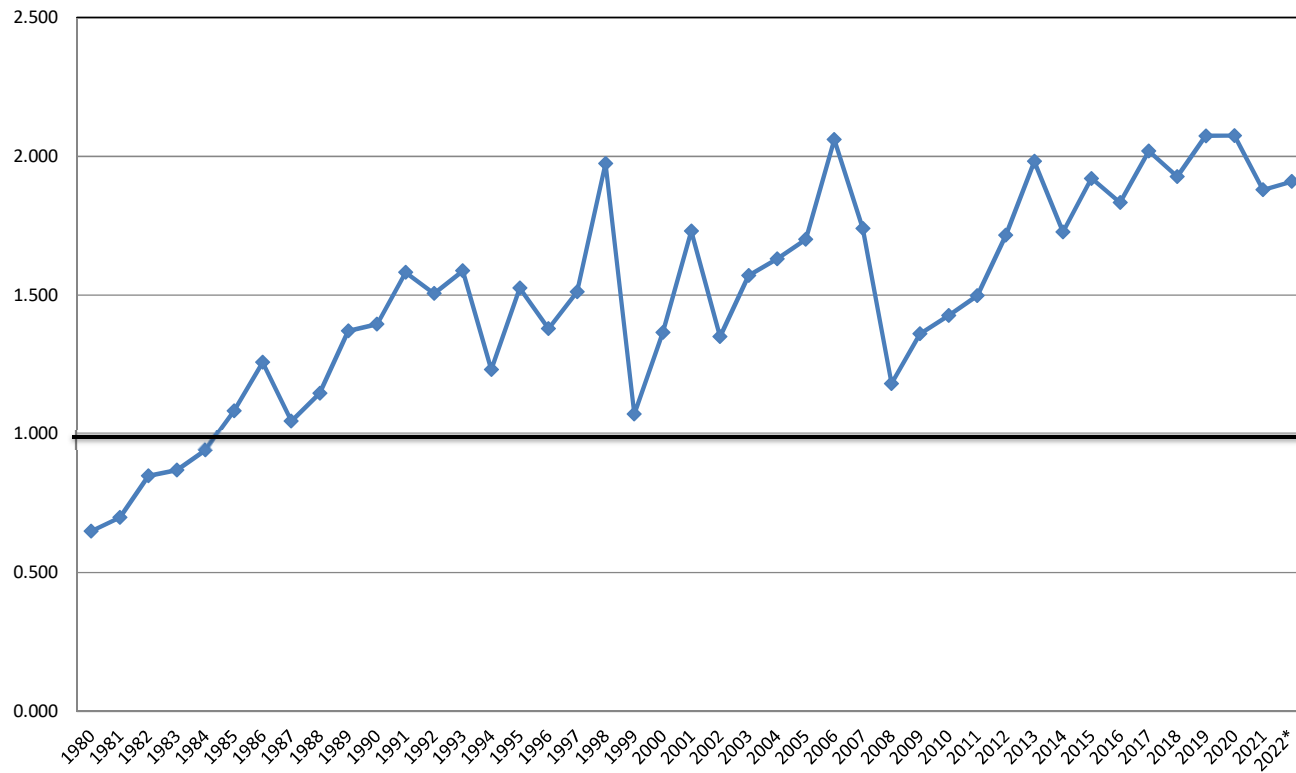
In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/110**

**M/B RATIO**

## Portland General Electric Company

### Common Stock Market/Book Ratio



Source:

1980 - 2000: Mergent Public Utility Manual.

2001 - 2015: AUS Utility Reports, multiple dates.

2016 - 2021: Value Line Investment Survey, multiple dates.

\* Value Line Investment Survey Reports, February 24, March 10, April 21, and May 12, 2023.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/111  
RISK PREMIUM- TREASURY BONDS**

## Portland General Electric Company

### Equity Risk Premium - Treasury Bond

<u>Line</u>	<u>Year</u>	<u>Authorized Electric Returns<sup>1</sup></u> (1)	<u>30 yr. Treasury Bond Yield<sup>2</sup></u> (2)	<u>Indicated Risk Premium</u> (3)	<u>Rolling 5 - Year Average</u> (4)	<u>Rolling 10 - Year Average</u> (5)
1	1986	13.93%	7.80%	6.13%		
2	1987	12.99%	8.58%	4.41%		
3	1988	12.79%	8.96%	3.83%		
4	1989	12.97%	8.45%	4.52%		
5	1990	12.70%	8.61%	4.09%	4.60%	
6	1991	12.55%	8.14%	4.41%	4.25%	
7	1992	12.09%	7.67%	4.42%	4.26%	
8	1993	11.41%	6.60%	4.81%	4.45%	
9	1994	11.34%	7.37%	3.97%	4.34%	
10	1995	11.55%	6.88%	4.67%	4.46%	4.53%
11	1996	11.39%	6.70%	4.69%	4.51%	4.38%
12	1997	11.40%	6.61%	4.79%	4.59%	4.42%
13	1998	11.66%	5.58%	6.08%	4.84%	4.65%
14	1999	10.77%	5.87%	4.90%	5.03%	4.68%
15	2000	11.43%	5.94%	5.49%	5.19%	4.82%
16	2001	11.09%	5.49%	5.60%	5.37%	4.94%
17	2002	11.16%	5.43%	5.73%	5.56%	5.07%
18	2003	10.97%	4.96%	6.01%	5.55%	5.19%
19	2004	10.75%	5.05%	5.70%	5.71%	5.37%
20	2005	10.54%	4.65%	5.89%	5.79%	5.49%
21	2006	10.34%	4.87%	5.47%	5.76%	5.57%
22	2007	10.31%	4.83%	5.48%	5.71%	5.64%
23	2008	10.37%	4.28%	6.09%	5.73%	5.64%
24	2009	10.52%	4.07%	6.45%	5.88%	5.79%
25	2010	10.29%	4.25%	6.04%	5.90%	5.85%
26	2011	10.19%	3.91%	6.28%	6.07%	5.91%
27	2012	10.01%	2.92%	7.09%	6.39%	6.05%
28	2013	9.81%	3.45%	6.36%	6.44%	6.09%
29	2014	9.75%	3.34%	6.41%	6.44%	6.16%
30	2015	9.60%	2.84%	6.76%	6.58%	6.24%
31	2016	9.60%	2.60%	7.00%	6.72%	6.40%
32	2017	9.68%	2.90%	6.79%	6.66%	6.53%
33	2018	9.55%	3.11%	6.44%	6.68%	6.56%
34	2019	9.64%	2.58%	7.06%	6.81%	6.62%
35	2020	9.39%	1.56%	7.83%	7.02%	6.80%
36	2021	9.39%	2.05%	7.34%	7.09%	6.91%
37	2022 <sup>3</sup>	9.52%	3.12%	6.41%	7.01%	6.84%
38	<b>Average</b>	<b>10.90%</b>	<b>5.19%</b>	<b>5.71%</b>	<b>5.68%</b>	<b>5.68%</b>
39	<b>Minimum</b>				<b>4.25%</b>	<b>4.38%</b>
40	<b>Maximum</b>				<b>7.09%</b>	<b>6.91%</b>

Sources:

<sup>1</sup> *Regulatory Research Associates, Inc.*, Regulatory Focus, Major Rate Case Decisions, Jan. 1997 p. 5, and Jan. 2011 p. 3.  
*S&P Global Market Intelligence*, RRA Regulatory Focus, Major Rate Case Decisions, January - December 2022  
February 23, 2023 at page 3.

2006 - 2022 Authorized Returns exclude limited issue rider cases.

<sup>2</sup> 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.

<sup>3</sup> Data represents January - December, 2022.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/112  
RISK PREMIUM- UTILITY BONDS**



## Portland General Electric Company

### Equity Risk Premium - Utility Bond

<u>Line</u>	<u>Year</u>	<u>Authorized Electric Returns<sup>1</sup></u> (1)	<u>Average "A" Rated Utility Bond Yield<sup>2</sup></u> (2)	<u>Indicated Risk Premium</u> (3)	<u>Rolling 5 - Year Average</u> (4)	<u>Rolling 10 - Year Average</u> (5)
1	1986	13.93%	9.58%	4.35%		
2	1987	12.99%	10.10%	2.89%		
3	1988	12.79%	10.49%	2.30%		
4	1989	12.97%	9.77%	3.20%		
5	1990	12.70%	9.86%	2.84%	3.12%	
6	1991	12.55%	9.36%	3.19%	2.88%	
7	1992	12.09%	8.69%	3.40%	2.99%	
8	1993	11.41%	7.59%	3.82%	3.29%	
9	1994	11.34%	8.31%	3.03%	3.26%	
10	1995	11.55%	7.89%	3.66%	3.42%	3.27%
11	1996	11.39%	7.75%	3.64%	3.51%	3.20%
12	1997	11.40%	7.60%	3.80%	3.59%	3.29%
13	1998	11.66%	7.04%	4.62%	3.75%	3.52%
14	1999	10.77%	7.62%	3.15%	3.77%	3.52%
15	2000	11.43%	8.24%	3.19%	3.68%	3.55%
16	2001	11.09%	7.76%	3.33%	3.62%	3.56%
17	2002	11.16%	7.37%	3.79%	3.61%	3.60%
18	2003	10.97%	6.58%	4.39%	3.57%	3.66%
19	2004	10.75%	6.16%	4.59%	3.86%	3.82%
20	2005	10.54%	5.65%	4.89%	4.20%	3.94%
21	2006	10.34%	6.07%	4.27%	4.39%	4.00%
22	2007	10.31%	6.07%	4.24%	4.48%	4.04%
23	2008	10.37%	6.53%	3.84%	4.37%	3.97%
24	2009	10.52%	6.04%	4.48%	4.34%	4.10%
25	2010	10.29%	5.47%	4.82%	4.33%	4.26%
26	2011	10.19%	5.04%	5.15%	4.51%	4.45%
27	2012	10.01%	4.13%	5.88%	4.83%	4.66%
28	2013	9.81%	4.48%	5.33%	5.13%	4.75%
29	2014	9.75%	4.28%	5.47%	5.33%	4.84%
30	2015	9.60%	4.12%	5.48%	5.46%	4.90%
31	2016	9.60%	3.93%	5.67%	5.57%	5.04%
32	2017	9.68%	4.00%	5.68%	5.53%	5.18%
33	2018	9.55%	4.25%	5.30%	5.52%	5.33%
34	2019	9.64%	3.77%	5.87%	5.60%	5.47%
35	2020	9.39%	3.05%	6.34%	5.77%	5.62%
36	2021	9.39%	3.10%	6.29%	5.90%	5.73%
37	2022 <sup>3</sup>	9.52%	4.72%	4.80%	5.72%	5.62%
37	<b>Average</b>	<b>10.90%</b>	<b>6.55%</b>	<b>4.35%</b>	<b>4.33%</b>	<b>4.32%</b>
38	<b>Minimum</b>				<b>2.88%</b>	<b>3.20%</b>
39	<b>Maximum</b>				<b>5.90%</b>	<b>5.73%</b>

Sources:

<sup>1</sup> *Regulatory Research Associates, Inc.*, Regulatory Focus, Major Rate Case Decisions, Jan. 1997 p. 5, and Jan. 2011 p. 3. S&P Global Market Intelligence, RRA Regulatory Focus, Major Rate Case Decisions, January - December 2022 February 23, 2023 at page 3.

2006 - 2022 Authorized Returns exclude limited issue rider cases.

<sup>2</sup> 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.

<sup>3</sup> Data represents January - December, 2022.

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

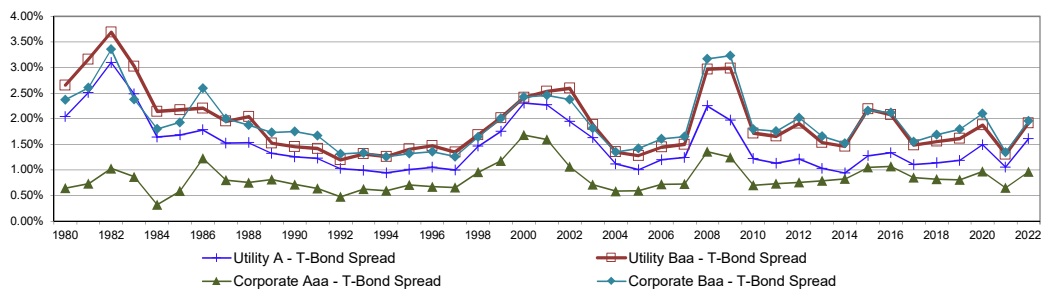
**EXHIBIT AWEC-CUB/113  
YIELD SPREADS**

## Portland General Electric Company

### Bond Yield Spreads

Line	Year	T-Bond Yield <sup>1</sup> (1)	Public Utility Bond				Corporate Bond				Utility to Corporate	
			A <sup>2</sup> (2)	Baa <sup>2</sup> (3)	A-T-Bond Spread (4)	Baa-T-Bond Spread (5)	Aaa <sup>3</sup> (6)	Baa <sup>3</sup> (7)	Aaa-T-Bond Spread (8)	Baa-T-Bond Spread (9)	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	4.87%	6.07%	6.32%	1.20%	1.44%	5.59%	6.48%	0.71%	1.61%	-0.16%	0.48%
28	2007	4.83%	6.07%	6.33%	1.24%	1.50%	5.56%	6.48%	0.72%	1.65%	-0.15%	0.52%
29	2008	4.28%	6.53%	7.25%	2.25%	2.97%	5.63%	7.45%	1.35%	3.17%	-0.20%	0.90%
30	2009	4.07%	6.04%	7.06%	1.97%	2.99%	5.31%	7.30%	1.24%	3.23%	-0.24%	0.73%
31	2010	4.25%	5.47%	5.96%	1.22%	1.71%	4.95%	6.04%	0.70%	1.79%	-0.08%	0.52%
32	2011	3.91%	5.04%	5.57%	1.13%	1.66%	4.64%	5.67%	0.73%	1.76%	-0.10%	0.40%
33	2012	2.92%	4.13%	4.83%	1.21%	1.90%	3.67%	4.94%	0.75%	2.02%	-0.11%	0.46%
34	2013	3.45%	4.48%	4.98%	1.03%	1.53%	4.24%	5.10%	0.79%	1.65%	-0.12%	0.24%
35	2014	3.34%	4.28%	4.80%	0.94%	1.46%	4.16%	4.86%	0.82%	1.52%	-0.06%	0.12%
36	2015	2.84%	4.12%	5.03%	1.27%	2.19%	3.89%	5.00%	1.05%	2.16%	0.03%	0.23%
37	2016	2.60%	3.93%	4.67%	1.33%	2.08%	3.66%	4.71%	1.07%	2.12%	-0.04%	0.27%
38	2017	2.90%	4.00%	4.38%	1.10%	1.48%	3.74%	4.44%	0.85%	1.55%	-0.06%	0.26%
39	2018	3.11%	4.25%	4.67%	1.14%	1.56%	3.93%	4.80%	0.82%	1.69%	-0.13%	0.32%
40	2019	2.58%	3.77%	4.19%	1.18%	1.61%	3.39%	4.38%	0.81%	1.79%	-0.18%	0.38%
41	2020	1.56%	3.05%	3.44%	1.49%	1.87%	2.53%	3.66%	0.96%	2.10%	-0.22%	0.53%
42	2021	2.05%	3.10%	3.36%	1.05%	1.30%	2.70%	3.39%	0.65%	1.34%	-0.04%	0.40%
43	2022 <sup>4</sup>	3.12%	4.72%	5.03%	1.61%	1.91%	4.08%	5.07%	0.96%	1.96%	-0.04%	0.65%
44	<b>Average</b>	<b>6.14%</b>	<b>7.62%</b>	<b>8.05%</b>	<b>1.49%</b>	<b>1.91%</b>	<b>6.98%</b>	<b>8.05%</b>	<b>0.84%</b>	<b>1.92%</b>	<b>0.00%</b>	<b>0.65%</b>

**Yield Spreads**  
Treasury Vs. Corporate & Treasury Vs. Utility



**Sources:**

- <sup>1</sup> St. Louis Federal Reserve: Economic Research, <http://research.stlouisfed.org/>.
- <sup>2</sup> 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 2010-2022 were obtained from <http://credittrends.moodys.com/>.
- <sup>3</sup> 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 2010-2022 were obtained from <http://credittrends.moodys.com/>.
- <sup>4</sup> Data represents January - December, 2022

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/114  
CURRENT BOND YIELDS**

# Portland General Electric Company

## 13-Week Treasury and Utility Bond Yields

<u>Line</u>	<u>Date</u>	<u>Treasury Bond Yield<sup>1</sup></u> (1)	<u>"A" Rated Utility Bond Yield<sup>2</sup></u> (2)	<u>"Baa" Rated Utility Bond Yield<sup>2</sup></u> (3)
1	05/12/23	3.78%	5.26%	5.61%
2	05/05/23	3.76%	5.24%	5.57%
3	04/28/23	3.67%	5.11%	5.45%
4	04/21/23	3.78%	5.21%	5.54%
5	04/14/23	3.74%	5.16%	5.49%
6	04/07/23	3.61%	5.01%	5.34%
7	03/31/23	3.67%	5.21%	5.52%
8	03/24/23	3.64%	5.29%	5.59%
9	03/17/23	3.60%	5.27%	5.55%
10	03/10/23	3.70%	5.34%	5.61%
11	03/03/23	3.90%	5.45%	5.72%
12	02/24/23	3.93%	5.49%	5.74%
13	02/17/23	3.88%	5.39%	5.65%
14	<b>Average</b>	<b>3.74%</b>	<b>5.26%</b>	<b>5.57%</b>
15	<b>Spread To Treasury</b>		<b>1.52%</b>	<b>1.83%</b>

---

Sources:

<sup>1</sup> St. Louis Federal Reserve: Economic Research, <http://research.stlouisfed.org>.

<sup>2</sup> <http://credittrends.moodys.com/>.

## Portland General Electric Company

### 26-Week Treasury and Utility Bond Yields

<u>Line</u>	<u>Date</u>	<u>Treasury Bond Yield<sup>1</sup></u> (1)	<u>"A" Rated Utility Bond Yield<sup>2</sup></u> (2)	<u>"Baa" Rated Utility Bond Yield<sup>2</sup></u> (3)
1	05/12/23	3.78%	5.26%	5.61%
2	05/05/23	3.76%	5.24%	5.57%
3	04/28/23	3.67%	5.11%	5.45%
4	04/21/23	3.78%	5.21%	5.54%
5	04/14/23	3.74%	5.16%	5.49%
6	04/07/23	3.61%	5.01%	5.34%
7	03/31/23	3.67%	5.21%	5.52%
8	03/24/23	3.64%	5.29%	5.59%
9	03/17/23	3.60%	5.27%	5.55%
10	03/10/23	3.70%	5.34%	5.61%
11	03/03/23	3.90%	5.45%	5.72%
12	02/24/23	3.93%	5.49%	5.74%
13	02/17/23	3.88%	5.39%	5.65%
14	02/10/23	3.83%	5.27%	5.54%
15	02/03/23	3.63%	5.08%	5.34%
16	01/27/23	3.64%	5.11%	5.39%
17	01/20/23	3.66%	5.16%	5.46%
18	01/13/23	3.61%	5.15%	5.44%
19	01/06/23	3.67%	5.28%	5.59%
20	12/30/22	3.97%	5.53%	5.83%
21	12/23/22	3.82%	5.42%	5.72%
22	12/16/22	3.53%	5.15%	5.43%
23	12/09/22	3.56%	5.17%	5.45%
24	12/02/22	3.56%	5.26%	5.54%
25	11/25/22	3.74%	5.46%	5.74%
26	11/18/22	3.92%	5.66%	5.95%
27	<b>Average</b>	<b>3.72%</b>	<b>5.27%</b>	<b>5.57%</b>
28	<b>Spread To Treasury</b>		<b>1.55%</b>	<b>1.85%</b>

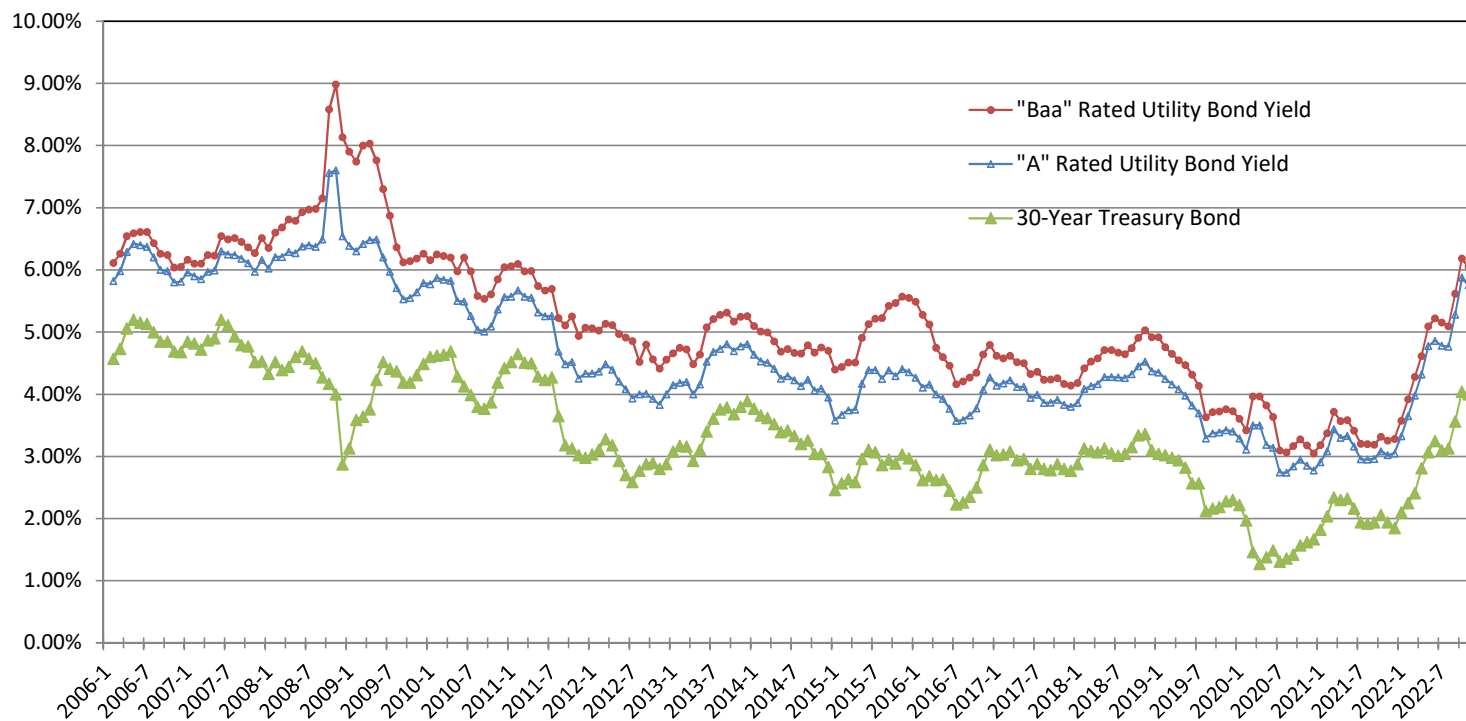
Sources:

<sup>1</sup> St. Louis Federal Reserve: Economic Research, <http://research.stlouisfed.org>.

<sup>2</sup> <http://credittrends.moodys.com/>.

# Portland General Electric Company

## Trends in Bond Yields



Sources:

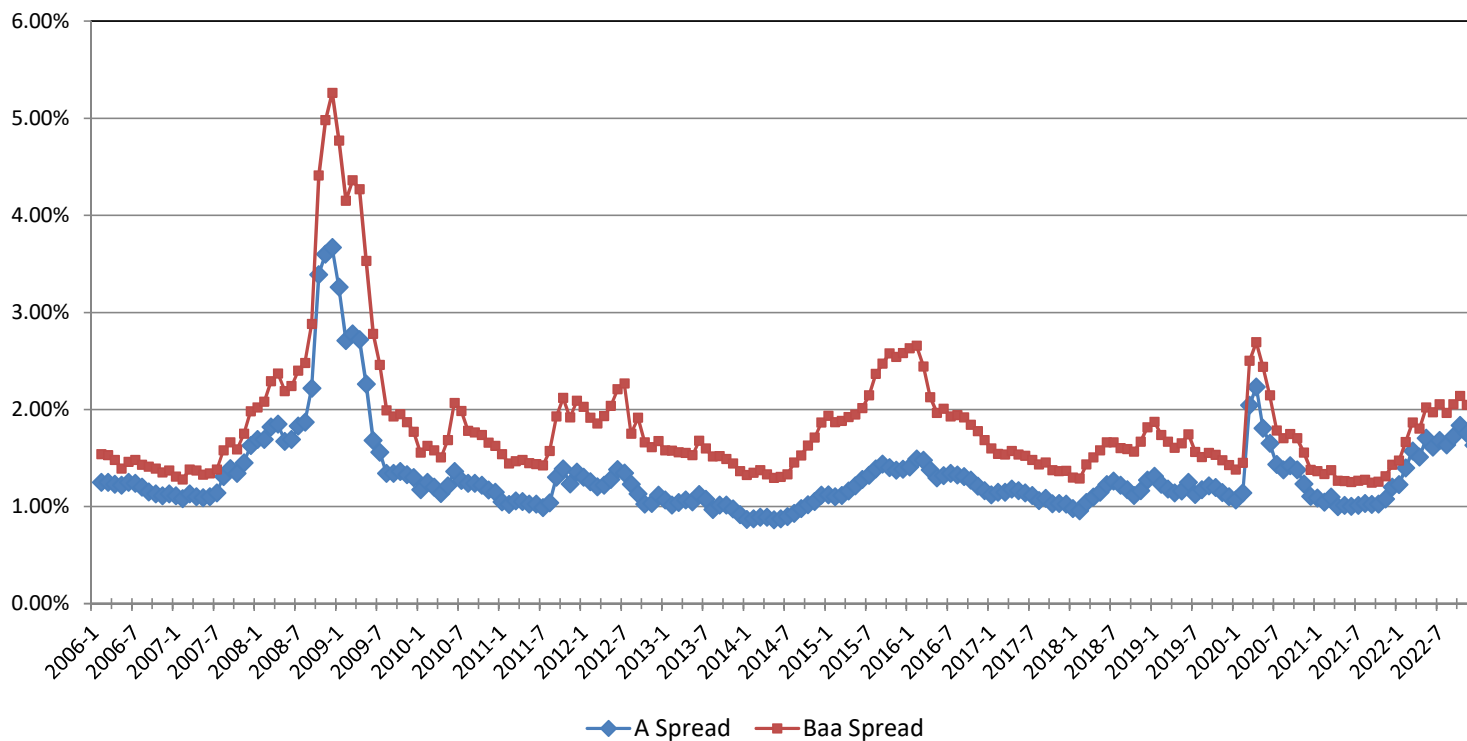
Mergent Bond Record.

[www.moodys.com](http://www.moodys.com), Bond Yields and Key Indicators.

St. Louis Federal Reserve: Economic Research, <http://research.stlouisfed.org/>

# Portland General Electric Company

## Yield Spread Between Utility Bonds and 30-Year Treasury Bonds



Sources:  
Mergent Bond Record.  
[www.moodys.com](http://www.moodys.com), Bond Yields and Key Indicators.  
St. Louis Federal Reserve: Economic Research, <http://research.stlouisfed.org/>



**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/115**

**BETA**

## Portland General Electric Company

### Beta

<u>Line</u>	<u>Company</u>	<u>Beta</u> <sup>1</sup>	<u>S&amp;P Global Market Intelligence Beta</u> <sup>2</sup>
1	ALLETE, Inc.	0.90	0.83
2	Alliant Energy Corporation	0.85	0.81
3	American Electric Power Company, Inc.	0.75	0.77
4	Ameren Corporation	0.85	0.77
5	Avista Corporation	0.90	0.77
6	Black Hills Corporation	0.95	0.89
7	CMS Energy Corporation	0.80	0.77
8	CenterPoint Energy, Inc.	1.10	0.94
9	Dominion Energy, Inc.	0.85	0.71
10	Duke Energy Corporation	0.85	0.76
11	Edison International	0.95	0.86
12	Entergy Corporation	0.95	0.86
13	Evergy, Inc.	0.90	0.80
14	Exelon Corporation	NMF	0.87
15	IDACORP, Inc.	0.80	0.79
16	NextEra Energy, Inc.	0.95	0.83
17	NorthWestern Corporation	0.90	0.87
18	OGE Energy Corp.	1.00	0.99
19	Otter Tail Corporation	0.90	0.85
20	Pinnacle West Capital Corporation	0.90	0.84
21	Public Service Enterprise Group Incorporated	0.90	0.86
22	Sempra Energy	0.95	0.84
23	Southern Company	0.90	0.82
24	WEC Energy Group, Inc.	0.80	0.77
25	Xcel Energy Inc.	0.80	0.78
26	<b>Average</b>	<b>0.89</b>	<b>0.83</b>
27	<b>Median</b>	<b>0.90</b>	<b>0.83</b>
28	<b>Historical Beta</b> <sup>3</sup>	<b>0.76</b>	

Source:

<sup>1</sup> *The Value Line Investment Survey*,  
March 10, April 21, and May 12, 2023.

<sup>2</sup> S&P Global Market Intelligence, betas for the period 5/12/2018 - 5/12/2023.

<sup>3</sup> AWEC-CUB/115, page 2.

Portland General Electric Company

Historical Betas  
(Electric Utilities)

Line	Company	Average	4Q22	3Q22	2Q22	1Q22	4Q21	3Q21	2Q21	1Q21	4Q20	3Q20	2Q20	1Q20	4Q19	3Q19	2Q19	1Q19	4Q18	3Q18	2Q18	1Q18	4Q17	3Q17	2Q17	1Q17	4Q16	3Q16	2Q16	1Q16	4Q15	3Q15	2Q15	1Q15	4Q14	3Q14				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)				
1	ALLETE, Inc.	0.79	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.80	0.65	0.65	0.65	0.65	0.65	0.70	0.75	0.75	0.80	0.75	0.80	0.80	0.75	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80		
2	Alliant Energy Corporation	0.75	0.85	0.85	0.80	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.80	0.55	0.60	0.60	0.60	0.65	0.60	0.65	0.70	0.70	0.70	0.70	0.70	0.70	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80		
3	American Electric Power Company, Inc.	0.67	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.50	0.55	0.55	0.55	0.55	0.55	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70		
4	Ameren Corporation	0.71	0.85	0.85	0.80	0.80	0.80	0.85	0.80	0.80	0.80	0.85	0.80	0.80	0.50	0.55	0.55	0.60	0.60	0.55	0.60	0.65	0.65	0.65	0.70	0.65	0.65	0.70	0.65	0.70	0.65	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
5	Avista Corporation	0.78	0.90	0.90	0.85	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.70	0.70	0.75	0.75	0.70	0.70	0.70	0.70	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80		
6	Black Hills Corporation	0.89	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.65	0.70	0.70	0.75	0.80	0.75	0.80	0.85	0.90	0.90	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.85	0.85	
7	CMS Energy Corporation	0.69	0.80	0.80	0.75	0.80	0.80	0.80	0.80	0.75	0.80	0.80	0.50	0.50	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
8	CenterPoint Energy, Inc.	0.93	1.10	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.10	1.10	1.15	0.70	0.80	0.80	0.80	0.80	0.85	0.85	0.90	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.80	0.80	0.80	0.75	0.75	
9	Dominion Energy, Inc.	0.70	0.80	0.80	0.80	0.85	0.85	0.85	0.85	0.80	0.80	0.80	0.80	0.80	0.50	0.55	0.55	0.55	0.55	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.70	0.65	0.70	0.70	0.70	0.78	0.70	0.70	0.70	0.70	0.70	0.70		
10	Duke Energy Corporation	0.66	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.45	0.50	0.50	0.50	0.50	0.55	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	
11	Edison International	0.74	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.90	0.90	0.55	0.55	0.60	0.60	0.60	0.55	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
12	Entergy Corporation	0.75	0.95	0.95	0.90	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.65	0.70	0.70	0.70	0.70	0.70	
13	Eversource Energy, Inc.	0.95	0.90	0.90	0.90	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.05	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
14	Exelon Corporation	0.77	0.95	NMF	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.65	0.70	0.70	0.70	0.70	0.70	0.65	0.65	0.70	0.70	0.70	0.70	0.65	0.70	0.65	0.70	0.65	0.70	0.65	0.70	0.65	0.70	0.70	0.70	0.70	
15	IDACORP, Inc.	0.73	0.80	0.80	0.80	0.80	0.85	0.85	0.80	0.80	0.80	0.80	0.80	0.50	0.55	0.55	0.60	0.60	0.55	0.60	0.65	0.70	0.70	0.70	0.70	0.75	0.75	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80		
16	NextEra Energy, Inc.	0.73	0.90	0.95	0.90	0.95	0.90	0.95	0.90	0.90	0.90	0.85	0.85	0.50	0.55	0.55	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.75	0.70	0.75	0.70	0.75	0.70	0.70	0.70	
17	NorthWestern Corporation	0.74	0.90	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.90	0.90	0.55	0.60	0.60	0.60	0.60	0.55	0.60	0.60	0.65	0.65	0.70	0.70	0.65	0.65	0.65	0.70	0.70	0.70	0.70	0.75	0.70	0.75	0.70	0.70	0.70	0.70	0.70	
18	OGX Energy Corp.	0.94	1.00	1.00	1.00	1.05	1.05	1.05	1.05	1.05	1.10	1.05	1.05	1.05	0.70	0.75	0.80	0.80	0.85	0.85	0.90	0.95	0.95	0.95	0.95	0.95	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85
19	Otter Tail Corporation	0.84	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.70	0.70	0.65	0.70	0.70	0.75	0.80	0.85	0.85	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.95
20	Pinnacle West Capital Corporation	0.72	0.90	0.90	0.90	0.90	0.95	0.90	0.90	0.90	0.85	0.85	0.85	0.45	0.50	0.55	0.55	0.55	0.55	0.60	0.65	0.65	0.70	0.70	0.65	0.65	0.70	0.70	0.70	0.70	0.75	0.75	0.75	0.70	0.70	0.70	0.70	0.70	0.70	
21	Public Service Enterprise Group Incorporated	0.76	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.70	0.65	0.70	0.70	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
22	Sempra Energy	0.82	0.95	0.95	0.95	0.95	1.00	N/A	0.95	1.00	0.95	1.00	0.95	0.95	0.65	0.70	0.75	0.75	0.75	0.75	0.75	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.75	0.75	
23	Southern Company	0.67	0.95	0.90	0.90	0.90	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.60	0.60	0.55	0.60	0.55	0.60	0.55	0.60	0.55	0.60
24	WEC Energy Group, Inc.	0.66	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.45	0.50	0.50	0.50	0.55	0.50	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.70	0.70	0.70	0.70	0.65	0.65	0.65	0.65	
25	Xcel Energy Inc.	0.65	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.75	0.45	0.50	0.50	0.50	0.50	0.55	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	
26	Average	0.76	0.89	0.89	0.89	0.90	0.91	0.91	0.90	0.90	0.89	0.89	0.89	0.78	0.57	0.60	0.61	0.62	0.62	0.63	0.66	0.70	0.71	0.71	0.70	0.70	0.71	0.70	0.72	0.74	0.75	0.75	0.74	0.75	0.74	0.75	0.74	0.74		

Source: Value Line Software Analyzer

**BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON**

**UE 416**

In the Matters of )  
 )  
PORTLAND GENERAL ELECTRIC )  
COMPANY, )  
 )  
Request for a General Rate Revision. )  
\_\_\_\_\_ )

**EXHIBIT AWEC-CUB/116**

**CAPM**

## Portland General Electric Company

### CAPM Return

Line	Description	Kroll	Risk Premium <sup>3</sup>	Average
		Normalized <sup>2</sup>	Derived	FERC
		MRP	MRP	S&P 500 DCF <sup>4</sup>
		(1)	(2)	Derived
				MRP
				(3)
<b>Current Beta</b>				
1	Risk-Free Rate <sup>1,2</sup>	3.88%	3.70%	3.70%
2	Market Risk Premium	6.00%	7.70%	7.50%
3	Beta <sup>6</sup>	0.89	0.89	0.89
4	<b>CAPM</b>	<b>9.23%</b>	<b>10.57%</b>	<b>10.39%</b>
<b>Historical Beta</b>				
5	Risk-Free Rate <sup>1,2</sup>	3.88%	3.70%	3.70%
6	Market Risk Premium	6.00%	7.70%	7.50%
7	Beta <sup>6</sup>	0.76	0.76	0.76
8	<b>CAPM</b>	<b>8.46%</b>	<b>9.57%</b>	<b>9.42%</b>
<b>Current S&amp;P Global Market Intelligence Beta</b>				
9	Risk-Free Rate <sup>1,2</sup>	3.88%	3.70%	3.70%
10	Market Risk Premium	6.00%	7.70%	7.50%
11	Beta <sup>6</sup>	0.83	0.83	0.83
12	<b>CAPM</b>	<b>8.84%</b>	<b>10.06%</b>	<b>9.89%</b>

Sources:

<sup>1</sup> Kroll Recommended U.S. Equity Risk Premium and Corresponding Risk-Free Rates to be Used in Computing Cost of Capital: January 2008 - Present, October 18, 2022.

<sup>2</sup> Blue Chip Financial Forecasts, May 1, 2023 at 2.

<sup>3</sup> Kroll 2023 S&P Global Market Intelligence Beta, page 138.

<sup>4</sup> S&P 500 1-Step DCF through May 12, 2023 for Dividend Paying Companies.

<sup>5</sup> S&P 500 1-Step DCF through May 12, 2023 for all Companies.

<sup>6</sup> AWEC-CUB/115, page 1.

# Portland General Electric Company

## Development of the Market Risk Premium

<u>Line</u>	<u>Description</u>	<u>MRP</u>
<b><u>Risk Premium Based Method:</u></b>		
1	Lg. Co. Stock Real Market Return	8.90% <sup>1</sup>
2	Projected Consumer Price Index	<u>2.30%</u> <sup>2</sup>
3	Expected Market Return	11.40%
4	Risk-Free Rate	<u>3.70%</u> <sup>2</sup>
5	Market Risk Premium	<b>7.70%</b>
<b><u>FERC S&amp;P 500 (Dividend Companies) 1-Step DCF Based Method:</u></b>		
6	S&P 500 Growth	8.70% <sup>3</sup>
7	Index Dividend Yield	1.90% <sup>3</sup>
8	Adjusted Yield	<u>1.98%</u>
9	Expected Market Return	10.68%
10	Risk-Free Rate	<u>3.70%</u> <sup>2</sup>
11	Market Risk Premium	<b>7.00%</b>
<b><u>FERC S&amp;P 500 (All Companies) 1-Step DCF Based Method:</u></b>		
12	Short-Term S&P 500 Growth	10.10% <sup>4</sup>
13	Index Dividend Yield	1.50% <sup>4</sup>
14	Adjusted Yield	<u>1.58%</u>
15	Expected Market Return	11.68%
16	Risk-Free Rate	<u>3.70%</u> <sup>2</sup>
17	Market Risk Premium	<b>8.00%</b>
18	Average DCF Based MRP	<b>7.50%</b>

### Sources & Note:

<sup>1</sup> *Kroll 2023 SBI Yearbook*, page 138.

<sup>2</sup> *Blue Chip Financial Forecast May 1, 2023*.

<sup>3</sup> S&P 500 1-Step DCF through May 12, 2023 for Dividend Paying Companies.

<sup>4</sup> S&P 500 1-Step DCF through May 12, 2023 for all Companies.