

BEFORE THE  
PUBLIC UTILITIES COMMISSION OF OHIO

In The Matter Of The Determination Of The	)	
Existence Of Significantly Excessive Earnings For 2017	)	
Under The Electric Security Plans of Ohio Edison	)	Case No. 18-857-EL-UNC
Company, The Cleveland Electric Illuminating	)	
Company, And The Toledo Edison Company	)	
	)	
In The Matter Of The Determination Of The	)	
Existence Of Significantly Excessive Earnings For 2018	)	
Under The Electric Security Plans of Ohio Edison	)	Case No. 19-1338-EL-UNC
Company, The Cleveland Electric Illuminating	)	
Company, And The Toledo Edison Company	)	
	)	
In The Matter Of The Determination Of The	)	
Existence Of Significantly Excessive Earnings For 2019	)	
Under The Electric Security Plans of Ohio Edison	)	Case No. 20-1034-EL-UNC
Company, The Cleveland Electric Illuminating	)	
Company, And The Toledo Edison Company	)	
	)	
In The Matter Of the Quadrennial Review Required	)	
By R.C. 4928.143(E) For The Electric Security Plans	)	
Of Ohio Edison Company, The Cleveland Electric	)	Case No. 20-1476-EL-UNC
Illuminating Company, and The Toledo Edison	)	
Company	)	

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**DIRECT TESTIMONY OF**

**DR. BENTE VILLADSEN**

**ON BEHALF OF**

**OHIO EDISON COMPANY,  
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY, AND  
THE TOLEDO EDISON COMPANY**

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**March 1, 2021**

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Schedule BV-1: Resume of Dr. Bente Villadsen

Schedule BV-2: Calculation of Comparable ROE

1   **I. INTRODUCTION AND SUMMARY**

2   **Q1.   Please state your name, occupation and address for the record.**

3   A1.   My name is Bente Villadsen and I am a principal at The Brattle Group's Boston office,  
4        which is located at One Beacon St., Boston, MA 02108.

5   **Q2.   Please summarize your education and professional experience.**

6   A2.   I have more than 20 years of experience working with regulated utilities on cost of  
7        capital and related matters. My practice focuses on cost of capital, regulatory finance,  
8        and accounting issues. I am the co-author of the text, "Risk and Return for Regulated  
9        Industries" and a frequent speaker on regulated finance at conferences and webinars. I  
10       have testified or filed expert reports on cost of capital in Alaska, Arizona, California,  
11       Hawaii, Illinois, Michigan, New Mexico, New York, Oregon, and Washington, as well  
12       as before the Bonneville Power Administration, Federal Energy Regulatory  
13       Commission, the Surface Transportation Board, the Alberta Utilities Commission, and  
14       the Ontario Energy Board. I have provided white papers on cost of capital to regulators  
15       in Australia, Canada, and Europe. I have testified or filed testimony on regulatory  
16       accounting issues before the Federal Energy Regulatory Commission ("FERC"), the  
17       Regulatory Commission of Alaska, the Michigan Public Service Commission, the  
18       Texas Public Utility Commission as well as in international and U.S. arbitrations, and  
19       regularly provide advice to utilities on regulatory matters as well as risk management.  
20       I hold a Ph.D. from Yale University and as BS/MS from University of Aarhus,  
21       Denmark. Schedule BV-1 contains more information on my professional qualifications  
22       as well as a list of my prior testimonies and publications.

23   **Q3.   What is the purpose of your testimony in this proceeding?**

24   A3.   I have been asked by Ohio Edison Company, The Cleveland Electric Illuminating  
25        Company and The Toledo Edison Company (the "Companies") to present information  
26        for purposes of testing whether the Companies' current Electric Security Plan ("ESP  
27        IV") is substantially likely to provide the Companies a return on common equity

1 (“ROE”) for the balance of ESP IV that is significantly in excess of that likely to be  
2 earned by comparable companies (the “Prospective SEET”). I am responsible for  
3 selecting a sample of comparable companies, calculating expected earnings for the  
4 comparable group for the period 2020-2024, and determining the threshold for what  
5 constitutes significantly excessive earnings.

6 **Q4. Please summarize your testimony.**

7 A4. I select a group of comparable companies using the XLU index that has been relied  
8 upon in prior SEET cases and find that the weighted average Prospective SEET  
9 Threshold is 24.1 percent and the Safe Harbor is 13.2 percent. Because 2020 has been  
10 an unusual year due to COVID-19, I recommend that the Prospective SEET use the  
11 forecasts for the period 2021-2024.<sup>1</sup> As a secondary test of this threshold, I also  
12 compared the results for 2021-2024 to recent actual results for 2018 and 2019 to  
13 confirm that the Safe Harbor of 13.2 percent and the Prospective SEET Threshold of  
14 24.1 percent determined by the XLU companies is reasonable.

15 **II. PROSPECTIVE SEET**

16 **Q5. What is the Prospective SEET?**

17 A5. If an ESP exceeds three years, the Public Utilities Commission of Ohio (“PUCO”) tests  
18 the ESP to determine, among other things, the following:

19 the prospective effect of the electric security plan to determine if that effect  
20 is substantially likely to provide the electric distribution utility with a return  
21 on common equity that is significantly in excess of the return on common  
22 equity that is likely to be earned by publicly traded companies, including  
23 utilities, that face comparable business and financial risk, with such  
24 adjustments for capital structure as may be appropriate.<sup>2</sup>

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<sup>1</sup> My results below present the data for 2020, but I recommend reliance only on the forecasts for 2021-2024. The Safe Harbor using 2020-2024 is 12.9% and the SEET Threshold is 22.2%. As an alternative, I present data for 2020 obtained prior to the onset of the COVID-19 pandemic with the Value Line forecasts being as of February 28, 2020. Thus, the data are forecasts that are not affected by the impact of COVID-19 on the comparable companies' financials.

<sup>2</sup> R.C. 4928.143(E).

1 The Prospective SEET is a forward-looking test that requires both a calculation of the  
2 Companies' projected total earned ROE for the forecast period and a calculation of the  
3 projected ROE of a comparable group of publicly-traded companies.

4 **Q6. Please describe the methodology used for your analysis.**

5 A6. First, I understand that the Companies' ESP IV goes through May 31, 2024, so I  
6 collected forward-looking data for the relevant time period 2020-2024. Second, I  
7 selected a group of comparable companies for which such forward-looking data is  
8 available, and I calculated their expected earnings for the period. Third, I calculated  
9 the Safe Harbor and SEET Threshold based on the comparable group's expected  
10 average ROE. I understand that this Prospective SEET Threshold is compared to the  
11 Companies' projected SEET ROEs for the period to determine whether the Companies'  
12 ESP IV is substantially likely to result in significantly excessive earnings.

13 **Q7. Is the methodology used for calculating the Safe Harbor and SEET Threshold**  
14 **under the Prospective SEET similar to that used in the historical SEET?**

15 A7. Yes. The methodology is similar, except that the annual historical SEET performed  
16 under Ohio Revised Code 4928.143(F) compares the Companies' realized ROE to that  
17 realized by comparable companies, while the Prospective SEET looks to expected  
18 earnings for the Companies and the comparable companies. When implementing the  
19 Prospective SEET, I followed the guidelines in prior Commission decisions on  
20 historical SEET cases, to the extent applicable.

21 **A. SELECTING COMPARABLE COMPANIES**

22 **Q8. How did you select a comparable group of companies?**

23 A8. I calculated baseline average expected ROE utilizing the companies that comprise the  
24 SPDR Select Sector Fund-Utility ("XLU") as the comparable group. XLU is an  
25 Exchange Traded Fund ("ETF") comprised of electric utilities, multi-utilities,  
26 independent power producers and energy traders, and gas utilities. The XLU companies  
27 are members of the S&P 500 and, consequently, large entities that are publicly traded.

1 My calculations using the XLU included the following companies: Ameren  
2 Corporation, American Electric Power, AES Corporation, Atmos Energy, American  
3 Water Works, CMS Energy, CenterPoint Energy, Dominion, DTE Energy, Duke  
4 Energy, Consolidated Edison, Edison International, Eversource, Entergy, Evergy,  
5 Exelon, FirstEnergy, Alliant, NextEra, NiSource, PSE&G, Pinnacle West, PPL,  
6 Southern Company, Sempra, WEC Energy Group, and Xcel Energy.

7 **Q9. How did you calculate the baseline ROE for the comparable companies?**

8 A9. The average expected ROE is calculated by adding the net income of the companies in  
9 the fund and dividing by the sum of average common equity of those companies. I also  
10 calculated the simple average of the expected ROE for the companies in the XLU index.

11 **Q10. Did you make any adjustments to the comparable companies or data?**

12 A10. I eliminated NRG Energy from the data as it had negative net income. I did not make  
13 other adjustments to the data.<sup>3</sup>

14 **B. ESTIMATING THE EXPECTED EARNINGS**

15 **Q11. Please describe the data and approach used to estimate the expected earnings for**  
16 **the comparable companies.**

17 A11. For each company in the XLU, I collected data on expected net income and common  
18 equity for 2020, 2021 and 2023-25 (in some instances 2024-2026)<sup>4</sup> from Value Line.  
19 As Value Line provides an annual forecast for 2020 and 2021 and in some instances  
20 2022, I rely on this data directly. However, Value Line only provides a generic forecast  
21 for 2023-2025 for most companies, which Value Line states is representative for 2024.  
22 In some instances, the generic forecast is for 2024-2026, which is representative for

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<sup>3</sup> I note that earnings as reported by Value Line do not include non-recurring gains or losses. Source: "How to read a Value Line Report," 2020, p. 9. I further note that I rely on income and common equity as reported by Value Line as of February 12, 2021. These figures may differ from those reported by Value Line in an earlier or later version of their data base, or from other sources.

<sup>4</sup> Details are provided in attachment BV-2.

2025. Consequently, I use the forecast for 2023-25 as a forecast for 2024 and the 2024-2026 forecast as a forecast for 2025 and interpolate linearly the expected net income and common equity for 2022 and 2023, so that for example, the expected net income for 2022 is set equal to 2/3 of the expected net income for 2021 plus 1/3 of the expected income for 2024. Because common equity is measured at the end of the year, while net income is measured over a year, I average the beginning of the year and end of the year common equity to obtain an average common equity. Consequently, I use the actual year-end 2019 common equity and the forecasted year-end 2020 common equity to determine the expected average common equity for 2020. The details of my calculations are in Schedule BV-2.<sup>5</sup>

**C. TEST FOR PROSPECTIVE SIGNIFICANTLY EXCESSIVE EXPECTED EARNINGS**

**Q12. Please describe the test performed.**

A12. Having determined the average expected earnings for the comparable companies, I next determined what constitutes the threshold for determining significantly excessive expected earnings under the Prospective SEET. To determine what constitutes significantly excessive expected earnings, I first consider the expected earnings of the comparable companies plus 2%, the so-called "Safe Harbor." Second, I consider the expected earnings of the comparable companies plus 1.645 times the standard deviation of the comparable group, which constitutes the Prospective SEET Threshold.

**Q13. Why are you using the 2% Safe Harbor?**

A13. The PUCO has stated that the

Commission is willing to recognize a 'safe harbor' of 200 basis points above the mean of the comparable group. To that end, any electric utility earning less than 200 basis points above the mean of the comparable group will be found not to have significantly excessive earnings.<sup>6</sup>

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<sup>5</sup> I further note that I rely on income and common equity as reported by Value Line as of February 12, 2021. These figures may differ from those reported by Value Line in an earlier or later version of their data base, or from other sources.

<sup>6</sup> Public Utilities Commission of Ohio, Finding and Order in Case No. 09-0786-EL-UNC, June 30, 2010.

1           Consequently, I determine the Safe Harbor in the Prospective SEET as the average of  
2           the comparable companies expected ROE plus 200 basis points.

3   **Q14. What is the significance of the 1.645 times the standard deviation that you add to**  
4   **the average ROE of the comparable companies?**

5   A14. Like the Safe Harbor, my reliance on this is based on PUCO precedent.<sup>7</sup> Specifically,  
6           in prior SEET cases, the PUCO has found to be appropriate the calculation of the SEET  
7           Threshold based on the average ROE plus 1.645 times the standard deviation of the  
8           comparable companies' ROE.<sup>8</sup> Consequently, I report that figure.

9   **Q15. Please summarize your calculations regarding the Prospective SEET.**

10   A15. Figure 1 below summarizes the Safe Harbor and SEET Thresholds for the Prospective  
11           SEET. I note that the results for 2020 rely in part on actual data as Value Line would  
12           have access to the results for the companies during the first three quarters in 2020, when  
13           they prepared their forecasts in December 2020, January 2021 or February 2021.<sup>9</sup>  
14           Additionally, the 2020 data are impacted by the financial impact of the ongoing  
15           COVID-19 pandemic and the restrictions states have imposed to combat the pandemic.  
16           Specifically, some companies may have been impacted more than others due to the  
17           nature of their customers or geographical location. The impact of COVID-19 and the  
18           fact that part of the data are historical (Q1 through Q3 were known at the time the data  
19           were pulled) rather than forward-looking means that the data for 2020 are not  
20           representative of a usual year. As I note above in footnote 8, the distribution of the  
21           forecasted ROE for 2020 does not follow the same pattern as that in years 2021-2024.

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<sup>7</sup> See, for example, Opinion and Order in Case No. 18-857-EL-UNC, (March 20, 2019), ¶29, which references Staff's methodology.

<sup>8</sup> I also note, that for years other than 2020, the results are scattered around the average ROE with figures near the average having the largest number of observations. Thus, the expected ROEs are plausibly following a normal distribution. From a statistical perspective, if the data follows a normal distribution, then 1.645 times the standard deviation of the observations constitute the so-called 95 percent confidence interval. This means that there is 95 percent probability that an ROE that follows the normal distribution with the same mean and standard deviation as the comparable companies will be below the average expected ROE plus 1.645 times the standard deviation.

<sup>9</sup> Value Line has yet to list 2020 data as "actual".



Accordingly, the estimated results for 2020 using this methodology should not be relied upon in isolation. Therefore, I recommend that the Prospective SEET relies on the average for 2021-2024, which is shown below along with the results for 2020-2024. In the event 2020 is relied upon on a standalone basis, I do show an alternative for 2020 that uses pre-COVID-19 Value Line data below.

**Figure 1:  
Summary of Safe Harbor and SEET Thresholds for XLU for the Prospective  
SEET**

	2020	2021	2022	2023	2024	2020-2024 Average	2021-2024 Average
<b>Weighted Average</b>	9.9%	11.0%	11.1%	11.3%	11.4%	10.9%	11.2%
<b>Safe Harbor</b>	11.9%	13.0%	13.1%	13.3%	13.4%	12.9%	13.2%
<b>Standard Deviation</b>	3.0%	7.4%	7.7%	8.0%	8.2%	6.8%	7.8%
<b>Standard Deviation Multiplier (95% Confidence)</b>	1.645	1.645	1.645	1.645	1.645	1.645	1.645
<b>SEET Threshold</b>	14.8%	23.2%	23.8%	24.4%	24.9%	22.2%	24.1%
<b>Simple Average</b>	10.0%	12.6%	12.8%	12.9%	13.0%	12.3%	12.8%
<b>Safe Harbor</b>	12.0%	14.6%	14.8%	14.9%	15.0%	14.3%	14.8%
<b>Standard Deviation</b>	3.0%	7.4%	7.7%	8.0%	8.2%	6.8%	7.8%
<b>Standard Deviation Multiplier (95% Confidence)</b>	1.645	1.645	1.645	1.645	1.645	1.645	1.645
<b>SEET Threshold</b>	14.9%	24.8%	25.4%	26.0%	26.5%	23.5%	25.7%

Source: Value Line Reports as of February 12, 2021 and Value Line CSF data as of February 12, 2021.

**Q16. What does the data above show?**

A16. As can be seen from the summary above, the weighted average expected ROE for 2021-2024 is 11.2 percent, so the Safe Harbor is 13.2 percent. The SEET Threshold is 24.1 percent for the period 2021-2024 and in no single year below 22 percent. As noted above, the 2020 figures are in part based on realized figures and substantially impacted by the financial implications of the COVID-19 pandemic, so that year is not representative and should not be relied upon.<sup>10</sup> While the methodology relied upon in the past utilizes a weighted average of the comparable group results, it is also reasonable to utilize a simple average. As such, Figure 1 also shows the simple average of the results, which weight all companies in the XLU the same. The results are more

<sup>10</sup> The standard deviation in 2020 is also below that of the expected ROE for 2021-2024, which plausibly is caused by the fact that as of February 2021, at least nine months of the year are known and COVID-19 has restricted the potential upside for the XLU companies.

1 than 100 basis points higher with a Safe Harbor of 14.8 percent and a SEET Threshold  
2 of 25.7 percent for the period 2021-2024.

3 Detailed data for each year and company is provided in Schedule BV-2.

4 **Q17. Did you undertake any tests on the results above?**

5 A17. Yes. To further test the results, I looked at the most recent SEET Thresholds for 2018  
6 and 2019, which were calculated by the Companies at 19.3 percent and 17.8 percent,  
7 respectively.<sup>11</sup> These figures are reasonable and albeit lower than the figure I  
8 calculated for the Prospective SEET at 22.2 percent for 2020-2024, it is closer to the  
9 average for the period than to the 2020-based results and thus confirms that 2020 was  
10 an unusual year.

11 Additionally, I calculated the Safe Harbor and SEET Threshold for 2020 using data  
12 from Value Line as of February 28, 2020 to avoid the financial implications of the  
13 COVID-19 pandemic that unduly impact the results. These results are shown in Figure  
14 2 below.

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<sup>11</sup> See, Case No. 19-1338-EL-UNC, Direct Testimony of Thomas J. Dolezal, Schedule TJD-1 and Case No. 20-1034-EL-UNC, Direct Testimony of Thomas J. Dolezal, Schedule TJD-1.

**Figure 2: Summary of 2020 Safe Harbor and SEET Thresholds  
for XLU for the Prospective SEET Using Pre-COVID-19 Data**

	<b>2020</b>
<b>Weighted Average</b>	11.3%
<b>Safe Harbor</b>	13.3%
<b>Standard Deviation</b>	3.1%
<b>Standard Deviation Multiplier (95% Confidence)</b>	1.645
<b>SEET Threshold</b>	16.5%
<b>Simple Average</b>	11.8%
<b>Safe Harbor</b>	13.8%
<b>Standard Deviation</b>	3.1%
<b>Standard Deviation Multiplier (95% Confidence)</b>	1.645
<b>SEET Threshold</b>	17.0%

Source: Value Line Reports as of February 28, 2020 and Value Line CSF data as of February 27, 2020.

**Q18. What does the table above show?**

A18. The table shows that the results using February 2021 data for 2020 are impacted substantially by the unusual circumstances of COVID-19 and / or the fact that as of February 2021, at least 3/4 of the 2020 year is known to those forecasting the year.<sup>12</sup> Specifically, the Safe Harbor for 2020 is 13.3% using the weighted average and 13.8% using the simple average. These figures are in line with the Safe Harbor figures for 2021-24 in Figure 1 above. The SEET Threshold is 16.5% and 17.0% using the weighted average and the simple average, respectively. These figures are much more in line with those for 2021 to 2024 than are the figures calculated as of February, 2021 for 2020 in Figure 11 above. Detailed data is provided in Schedule BV-2.

**D. CONCLUSIONS**

**Q19. Based on the analysis above, what do you conclude?**

<sup>12</sup> As of February 15, 2021, the Q3 2020 results will be available through form 10-Qs. Depending on the news releases of the members of the comparable group, information past Q3 could also be available for some comparable group companies.

1 A19. Based on my analysis of the comparable companies above, the Safe Harbor for the  
2 Prospective SEET is 13.2 and the SEET Threshold is 24.1 using the recommended  
3 2021-2024 period. The Safe Harbor for the Prospective SEET is 12.9 percent and the  
4 SEET Threshold is 22.2 percent using the period 2020 - 2024. I conclude that the  
5 Companies' ESP IV is not substantially likely to result in significantly excessive  
6 earnings if their projected total earned SEET ROEs (on average over the balance of  
7 ESP IV) remain below the SEET Threshold of 24.1 percent or the 2020-24 SEET  
8 Threshold of 22.2 percent calculated above. Lastly, I note that the pre-COVID-19 data  
9 for 2020 show that the results using the February 2021 Value Line data for 2020  
10 provides unusual results due to the unusual 2020 year and therefore should not be relied  
11 upon on a standalone basis.

12 **Q20. Does this conclude your direct testimony?**

13 A20. Yes.

## SCHEDULE BV-1: RESUME OF DR. BENTE VILLADSEN

**Dr. Bente Villadsen's** work concentrates in the areas of regulatory finance and accounting. Her recent work has focused on accounting issues, damages, cost of capital and regulatory finance. Dr. Villadsen has testified on cost of capital and accounting, analyzed credit issues in the utility industry, risk management practices as well the impact of regulatory initiatives such as energy efficiency and de-coupling on cost of capital and earnings. Among her recent advisory work is assisting entities in the acquisition of regulated utilities regarding issues such the return on equity, capital structure, recovery of costs and capital expenditures, growth opportunities, and regulatory environments as well as the precedence for regulatory approval in mergers or acquisitions. Dr. Villadsen's accounting work has pertained to disclosure issues and principles including impairment testing, fair value accounting, leases, accounting for hybrid securities, accounting for equity investments, cash flow estimation as well as overhead allocation. Dr. Villadsen has estimated damages in the U.S. as well as internationally for companies in the construction, telecommunications, energy, cement, and rail road industry. She has filed testimony and testified in federal and state court, in international and U.S. arbitrations and before state and federal regulatory commissions on accounting issues, damages, discount rates and cost of capital for regulated entities.

Dr. Villadsen holds a Ph.D. from Yale University's School of Management with a concentration in accounting. She has a joint degree in mathematics and economics (BS and MS) from University of Aarhus in Denmark. Prior to joining The Brattle Group, Dr. Villadsen was a faculty member at Washington University in St. Louis, University of Michigan, and University of Iowa.

She has taught financial and managerial accounting as well as econometrics, quantitative methods, and economics of information to undergraduate or graduate students. Dr. Villadsen serves as the president of the Society of Utility Regulatory Financial Analysts for 2016-2018.

### AREAS OF EXPERTISE

- Regulatory Finance
  - Cost of Capital
  - Cost of Service (including prudence)
  - Energy Efficiency, De-coupling and the Impact on Utilities Financials
  - Relationship between regulation and credit worthiness
  - Risk Management
  - Regulatory Advisory in Mergers & Acquisitions
- Accounting and Corporate Finance
  - Application of Accounting Standards
  - Disclosure Issues
  - Forensics
  - Credit Issues in the Utility Industry
- Damages and Valuation (incl. international arbitration)
  - Utility valuation

## SCHEDULE BV-1

- Lost Profit for construction, oil&gas, utilities
- Valuation of construction contract
- Damages from the choice of inaccurate accounting methodology

### EXPERIENCE

#### Regulatory Finance

- Dr. Villadsen has testified on cost of capital and capital structure for many regulated entities including electric and gas utilities, pipelines, railroads, water utilities and barges in many jurisdictions including at the FERC, the Surface Transportation Board, the states of Alaska, Arizona, California, Hawaii, Illinois, Michigan, New Mexico, New York, Oregon, and Washington as well as in the provinces of Alberta and Ontario.
- On behalf of the Association of American Railroads, Dr. Villadsen appeared as an expert before the Surface Transportation Board (STB) and submitted expert reports on the determination of the cost of equity for U.S. freight railroads. The STB agreed to continue to use two estimation methods with the parameters suggested.
- On behalf of two taxpayers, Dr. Villadsen has testified on the methodology used to estimate the discount rate for the income approach to property valuation in Utah district court.
- For several electric, gas and transmission utilities as well as pipelines in Alberta, Canada, Dr. Villadsen filed evidence and appeared as an expert on the cost of equity and appropriate capital structure for 2015-17. Her evidence was heard by the Alberta Utilities Commission.
- Dr. Villadsen has estimated the cost of capital and recommended an appropriate capital structure for natural gas and liquids pipelines in Canada, Mexico, and the US. using the jurisdictions' preferred estimation technique as well as other standard techniques. This work has been used in negotiations with shippers as well as before regulators.
- For the Ontario Energy Board Staff, Dr. Villadsen submitted evidence on the appropriate capital structure for a power generator that is engaged in a nuclear refurbishment program.
- Dr. Villadsen has advised many acquirers and potential acquirers of regulated utilities regarding the return on equity, capital structure, recovery of costs and capital expenditures, growth opportunities, and regulatory environments as well as the precedence for regulatory approval in mergers or acquisitions. Her work has pertained to many jurisdiction in the U.S. and Canada including more than 20 states and three provinces as well as the Federal Energy Regulatory Commission.

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- She has estimated the cost of equity on behalf of entities such as Anchorage Municipal Light and Power, Arizona Public Service, Portland General Electric, Anchorage Water and Wastewater, NW Natural, Nicor, Consolidated Edison, Southern California Edison, American Water, California Water, and EPCOR in state regulatory proceedings. She has also submitted testimony before the FERC on behalf of electric transmission and natural gas pipelines as well as Bonneville Power Authority. Much of her testimony involves not only cost of capital estimation but also capital structure, the impact on credit metrics and various regulatory mechanisms such as revenue stabilization, riders and trackers.
- In Australia, she has submitted led and co-authored a report on cost of equity and debt estimation methods for the Australian Pipeline Industry Association. The equity report was filed with the Australian Energy Regulator as part of the APIA's response to the Australian Energy Regulator's development of rate of return guidelines and both reports were filed with the Economic Regulation Authority by the Dampier Bunbury Pipeline. She has also submitted a report on aspects of the WACC calculation for Aurizon Network to the Queensland Competition Authority.
- In Canada, Dr. Villadsen has co-authored reports for the British Columbia Utilities Commission and the Canadian Transportation Agency regarding cost of capital methodologies. Her work consisted partly of summarizing and evaluating the pros and cons of methods and partly of surveying Canadian and world-wide practices regarding cost of capital estimation.
- Dr. Villadsen worked with utilities to estimate the magnitude of the financial risk inherent in long-term gas contracts. In doing so, she relied on the rating agency of Standard & Poor's published methodology for determining the risk when measuring credit ratios.
- She has worked on behalf of infrastructure funds, pension funds, utilities and others on understanding and evaluating the regulatory environment in which electric, natural gas, or water utilities operate for the purpose of enhancing investors ability to understand potential investments. She has also provided advise and testimony in the approval phase of acquisitions.
- On behalf of utilities that are providers of last resort, she has provided estimates of the proper compensation for providing the state-mandated services to wholesale generators.
- In connection with the AWC Companies application to construct a backbone electric transmission project off the Mid-Atlantic Coast, Dr. Villadsen submitted testimony before the Federal Energy Regulatory Commission on the treatment the accounting and regulatory

## SCHEDULE BV-1

treatment of regulatory assets, pre-construction costs, construction work in progress, and capitalization issues.

- On behalf of ITC Holdings, she filed testimony with the Federal Energy Regulatory Commission regarding capital structure issues.
- For a FERC-regulated entity, Dr. Villadsen undertook an assessment of the company's classification of specific long-term commitments, leases, regulatory assets, asset retirement obligations, and contributions / distributions to owners in the company's FERC Form 1.
- Testimony on the impact of transaction specific changes to pension plans and other rate base issues on behalf of Balfour Beatty Infrastructure Partners before the Michigan Public Service Commission.
- On behalf of financial institutions, Dr. Villadsen has led several teams that provided regulatory guidance regarding state, provincial or federal regulatory issues for integrated electric utilities, transmission assets and generation facilities. The work was requested in connection with the institutions evaluation of potential investments.
- For a natural gas utility facing concerns over mark to market losses on long term gas hedges, Dr. Villadsen helped develop a program for basing a portion of hedge targets on trends in market volatility rather than on just price movements and volume goals. The approach was refined and approved in a series of workshops involving the utility, the state regulatory staff, and active intervener groups. These workshops evolved into a forum for quarterly updates on market trends and hedging positions.
- She has advised the private equity arm of three large financial institutions as well as two infrastructure companies, a sovereign fund and pension fund in connection with their acquisition of regulated transmission, distribution or integrated electric assets in the U.S. and Canada. For these clients, Dr. Villadsen evaluated the regulatory climate and the treatment of acquisition specific changes affecting the regulated entity, capital expenditures, specific cost items and the impact of regulatory initiatives such as the FERC's incentive return or specific states' approaches to the recovery of capital expenditures riders and trackers. She has also reviewed the assumptions or worked directly with the acquirer's financial model.
- On behalf of a provider of electric power to a larger industrial company, Dr. Villadsen assisted in the evaluation of the credit terms and regulatory provisions for the long-term power contract.
- For several large electric utility, Dr. Villadsen reviewed the hedging strategies for electricity and gas and modeled the risk mitigation of hedges entered into. She also studies the prevalence



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and merits of using swaps to hedge gas costs. This work was used in connection with prudence reviews of hedging costs in Colorado, Oregon, Utah, West Virginia, and Wyoming.

- She estimated the cost of capital for major U.S. and Canadian utilities, pipelines, and railroads. The work has been used in connection with the companies' rate hearings before the Federal Energy Regulatory Commission, the Canadian National Energy Board, the Surface Transportation Board, and state and provincial regulatory bodies. The work has been performed for pipelines, integrated electric utilities, non-integrated electric utilities, gas distribution companies, water utilities, railroads and other parties. For the owner of Heathrow and Gatwick Airport facilities, she has assisted in estimating the cost of capital of U.K. based airports. The resulting report was filed with the U.K. Competition Commission.
- For a Canadian pipeline, Dr. Villadsen co-authored an expert report regarding the cost of equity capital and the magnitude of asset retirement obligations. This work was used in arbitration between the pipeline owner and its shippers.
- In a matter pertaining to regulatory cost allocation, Dr. Villadsen assisted counsel in collecting necessary internal documents, reviewing internal accounting records and using this information to assess the reasonableness of the cost allocation.
- She has been engaged to estimate the cost of capital or appropriate discount rate to apply to segments of operations such as the power production segment for utilities.
- In connection with rate hearings for electric utilities, Dr. Villadsen has estimated the impact of power purchase agreements on the company's credit ratings and calculated appropriate compensation for utilities that sign such agreements to fulfill, for example, renewable energy requirements.
- Dr. Villadsen has been part of a team assessing the impact of conservation initiatives, energy efficiency, and decoupling of volumes and revenues on electric utilities financial performance. Specifically, she has estimated the impact of specific regulatory proposals on the affected utilities earnings and cash flow.
- On behalf of Progress Energy, she evaluated the impact of a depreciation proposal on an electric utility's financial metric and also investigated the accounting and regulatory precedent for the proposal.
- For a large integrated utility in the U.S., Dr. Villadsen has for several years participated in a large range of issues regarding the company's rate filing, including the company's cost of

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capital, incentive based rates, fuel adjustment clauses, and regulatory accounting issues pertaining to depreciation, pensions, and compensation.

- Dr. Villadsen has been involved in several projects evaluating the impact of credit ratings on electric utilities. She was part of a team evaluating the impact of accounting fraud on an energy company's credit rating and assessing the company's credit rating but-for the accounting fraud.
- For a large electric utility, Dr. Villadsen modeled cash flows and analyzed its financing decisions to determine the degree to which the company was in financial distress as a consequence of long-term energy contracts.
- For a large electric utility without generation assets, Dr. Villadsen assisted in the assessment of the risk added from offering its customers a price protection plan and being the provider of last resort (POLR).
- For several infrastructure companies, Dr. Villadsen has provided advice regarding the regulatory issues such as the allowed return on equity, capital structure, the determination of rate base and revenue requirement, the recovery of pension, capital expenditure, fuel, and other costs as well as the ability to earn the allowed return on equity. Her work has spanned 12 U.S. states as well as Canada, Europe, and South America. She has been involved in the electric, natural gas, water, and toll road industry.

### Accounting and Corporate Finance

- For an electric utility subject to international arbitration, Dr. Villadsen submitted expert testimony on the application of IFRS as it pertains to receivables, the classification of liabilities and contingencies.
- In international arbitration, she submitted an expert report on IFRS' requirements regarding carve out financials, impairment, the allocation of costs to segments, and disclosure issues.
- On behalf of a construction company in arbitration with a sovereign, Dr. Villadsen filed an expert report report quantifying damages in the form of lost profit and consequential damages.
- In arbitration before the International Chamber of Commerce Dr. Villadsen testified regarding the true-up clauses in a sales and purchase agreement, she testified on the distinction between accruals and cash flow measures as well as on the measurement of specific expenses and cash flows.

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- On behalf of a taxpayer, Dr. Villadsen recently testified in federal court on the impact of discount rates on the economic value of alternative scenarios in a lease transaction.
- On behalf of a taxpayer, Dr. Villadsen has provided an expert report on the nature of the cost of equity used in regulatory proceedings as well as the interest rate regime in 2014.
- In an arbitration matter before the International Centre for Settlement of Investment Disputes, she provided expert reports and oral testimony on the allocation of corporate overhead costs and damages in the form of lost profit. Dr. Villadsen also reviewed internal book keeping records to assess how various inter-company transactions were handled.
- Dr. Villadsen provided expert reports and testimony in an international arbitration under the International Chamber of Commerce on the proper application of US GAAP in determining shareholders' equity. Among other accounting issues, she testified on impairment of long-lived assets, lease accounting, the equity method of accounting, and the measurement of investing activities.
- In a proceeding before the International Chamber of Commerce, she provided expert testimony on the interpretation of certain accounting terms related to the distinction of accruals and cash flow.
- In an arbitration before the American Arbitration Association, she provided expert reports on the equity method of accounting, the classification of debt versus equity and the distinction between categories of liabilities in a contract dispute between two major oil companies. For the purpose of determining whether the classification was appropriate, Dr. Villadsen had to review the company's internal book keeping records.
- In U.S. District Court, Dr. Villadsen filed testimony regarding the information required to determine accounting income losses associated with a breach of contract and cash flow modeling.
- Dr. Villadsen recently assisted counsel in a litigation matter regarding the determination of fair values of financial assets, where there was a limited market for comparable assets. She researched how the designation of these assets to levels under the FASB guidelines affect the value investors assign to these assets.
- She has worked extensively on litigation matters involving the proper application of mark-to-market and derivative accounting in the energy industry. The work relates to the proper

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valuation of energy contracts, the application of accounting principles, and disclosure requirements regarding derivatives.

- Dr. Villadsen evaluated the accounting practices of a mortgage lender and the mortgage industry to assess the information available to the market and ESOP plan administrators prior to the company's filing for bankruptcy. A large part of the work consisted of comparing the company's and the industry's implementation of gain-of-sale accounting.
- In a confidential retention matter, Dr. Villadsen assisted attorneys for the FDIC evaluate the books for a financial investment institution that had acquired substantial Mortgage Backed Securities. The dispute evolved around the degree to which the financial institution had impaired the assets due to possible put backs and the magnitude and estimation of the financial institution's contingencies at the time of it acquired the securities.
- In connection with a securities litigation matter she provided expert consulting support and litigation consulting on forensic accounting. Specifically, she reviewed internal documents, financial disclosure and audit workpapers to determine (1) how the balance's sheets trading assets had been valued, (2) whether the valuation was following GAAP, (3) was properly documented, (4) was recorded consistently internally and externally, and (5) whether the auditor had looked at and documented the valuation was in accordance with GAAP.
- In a securities fraud matter, Dr. Villadsen evaluated a company's revenue recognition methods and other accounting issues related to allegations of improper treatment of non-cash trades and round trip trades.
- For a multi-national corporation with divisions in several countries and industries, Dr. Villadsen estimated the appropriate discount rate to value the divisions. She also assisted the company in determining the proper manner in which to allocate capital to the various divisions, when the company faced capital constraints.
- Dr. Villadsen evaluated the performance of segments of regulated entities. She also reviewed and evaluated the methods used for overhead allocation.
- She has worked on accounting issues in connection with several tax matters. The focus of her work has been the application of accounting principles to evaluate intra-company transactions, the accounting treatment of security sales, and the classification of debt and equity instruments.

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- For a large integrated oil company, Dr. Villadsen estimated the company's cost of capital and assisted in the analysis of the company's accounting and market performance.
- In connection with a bankruptcy proceeding, Dr. Villadsen provided litigation support for attorneys and an expert regarding corporate governance.

### Damages and Valuation

- For the Alaska Industrial Development and Export Authority, Dr. Villadsen co-authored a report that estimated the range of recent acquisition and trading multiples for natural gas utilities.
- On behalf of a taxpayer, Dr. Villadsen testified on the economic value of alternative scenarios in a lease transaction regarding infrastructure assets.
- For a foreign construction company involved in an international arbitration, she estimated the damages in the form of lost profit on the breach of a contract between a sovereign state and a construction company. As part of her analysis, Dr. Villadsen relied on statistical analyses of cost structures and assessed the impact of delays.
- In an international arbitration, Dr. Villadsen estimated the damages to a telecommunication equipment company from misrepresentation regarding the product quality and accounting performance of an acquired company. She also evaluated the IPO market during the period to assess the possibility of the merged company to undertake a successful IPO.
- On behalf of pension plan participants, Dr. Villadsen used an event study estimated the stock price drop of a company that had engaged in accounting fraud. Her testimony conducted an event study to assess the impact of news regarding the accounting misstatements.
- In connection with a FINRA arbitration matter, Dr. Villadsen estimated the value of a portfolio of warrants and options in the energy sector and provided support to counsel on finance and accounting issues.
- She assisted in the estimation of net worth of individual segments for firms in the consumer product industry. Further, she built a model to analyze the segment's vulnerability to additional fixed costs and its risk of bankruptcy.

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- Dr. Villadsen was part of a team estimating the damages that may have been caused by a flawed assumption in the determination of the fair value of mortgage related instruments. She provided litigation support to the testifying expert and attorneys.
- For an electric utility, Dr. Villadsen estimated the loss in firm value from the breach of a power purchase contract during the height of the Western electric power crisis. As part of the assignment, Dr. Villadsen evaluated the creditworthiness of the utility before and after the breach of contract.
- Dr. Villadsen modeled the cash flows of several companies with and without specific power contract to estimate the impact on cash flow and ultimately the creditworthiness and value of the utilities in question.

## BOOKS

“*Risk and Return for Regulated Industries*,” (with Michael J. Vilbert, Dan Harris, and A. Lawrence Kolbe) Elsevier, May 2017.

## PUBLICATIONS AND REPORTS

“A Review of International Approaches to Regulated Rates of Return,” (with J. Anthony, T. Brown, L. Figurelli, D. Harris, and N. Nguyen) published by the *Australian Energy Regulator*, September 2020.

“Global Impacts and Implications of COVID-19 on Utility Finance,” (with R. Mudge, F. Graves, J. Figueroa, T. Counts, L. Mwalenga, and S. Pant), *The Brattle Group*, July 2020.

“Impact of New Tax Law on Utilities’ Deferred Taxes,” (with Mike Tolleth and Elliott Metzler), *CRRRI 37<sup>th</sup> Annual Eastern Conference*, June, 2018.

“Implications of the New Tax Law for Regulated Utilities,” *The Brattle Group*, January 2018.

“Using Electric and Gas Forwards to Manage Market Risks: When a power purchase agreement with a utility is not possible, standard forward contracts can act as viable hedging instruments,” *North American Windpower*, May 2017, pp. 34-37.

“*Managing Price Risk for Merchant Renewable Investments: Role of Market Interactions and Dynamics on Effective Hedging Strategies*,” (with Onur Aydin and Frank Graves), *Brattle Whitepaper*, January 2017.

“Aurizon Network 2016 Access Undertaking: Aspects of the WACC,” (with Mike Tolleth), filed with the *Queensland Competition Authority*, Australia, November 2016.

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“Report on Gas LDC multiples,” with Michael J. Vilbert, *Alaska Industrial Development and Export Authority*, May 2015.

“Aurizon Network 2014 Draft Access Undertaking: Comments on Aspects of the WACC,” prepared for Aurizon Network and submitted to the *Queensland Competition Authority*, December 2014

“*Brattle Review of AE Planning Methods and Austin Task Force Report.*” (with Frank C. Graves) September 24, 2014.

Report on “Cost of Capital for Telecom Italia’s Regulated Business” with Stewart C. Myers and Francesco Lo Passo before the *Communications Regulatory Authority of Italy* (“AGCOM”), March 2014. *Submitted in Italian.*

“Alternative Regulation and Ratemaking Approaches for Water Companies: Supporting the Capital Investment Needs of the 21st Century,” (with J. Wharton and H. Bishop), prepared for the *National Association of Water Companies*, October 2013.

“Estimating the Cost of Debt,” (with T. Brown), prepared for the Dampier Bunbury Pipeline and filed with the *Economic Regulation Authority*, Western Australia, March 2013.

“Estimating the Cost of Equity for Regulated Companies,” (with P.R. Carpenter, M.J. Vilbert, T. Brown, and P. Kumar), prepared for the Australian Pipeline Industry Association and filed with the *Australian Energy Regulator* and the *Economic Regulation Authority*, Western Australia, February 2013.

“Calculating the Equity Risk Premium and the Risk Free Rate,” (with Dan Harris and Francesco LoPasso), prepared for *NMa and Opta, the Netherlands*, November 2012.

“Shale Gas and Pipeline Risk: Earnings Erosion in a More Competitive World,” (with Paul R. Carpenter, A. Lawrence Kolbe, and Steven H. Levine), *Public Utilities Fortnightly*, April 2012.

“Survey of Cost of Capital Practices in Canada,” (with Michael J. Vilbert and Toby Brown), prepared for *British Columbia Utilities Commission*, May 2012.

“Public Sector Discount Rates” (with rank Graves, Bin Zhou), *Brattle* white paper, September 2011

“FASB Accounting Rules and Implications for Natural Gas Purchase Agreements,” (with Fiona Wang), *American Clean Skies Foundation*, February 2011.

“IFRS and You: How the New Standards Affect Utility Balance Sheets,” (with Amit Koshal and Wyatt Toolson), *Public Utilities Fortnightly*, December 2010.

“Corporate Pension Plans: New Developments and Litigation,” (with George Oldfield and Urvashi Malhotra), Finance Newsletter, Issue 01, *The Brattle Group*, November 2010.

“Review of Regulatory Cost of Capital Methodologies,” (with Michael J. Vilbert and Matthew Aharonian), *Canadian Transportation Agency*, September 2010.

“Building Sustainable Efficiency Businesses: Evaluating Business Models,” (with Joe Wharton and Peter Fox-Penner), *Edison Electric Institute*, August 2008.

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“Understanding Debt Imputation Issues,” (with Michael J. Vilbert and Joe Wharton and *The Brattle Group* listed as an author), *Edison Electric Institute*, June 2008.

“Measuring Return on Equity Correctly: Why current estimation models set allowed ROE too low,” *Public Utilities Fortnightly*, August 2005 (with A. Lawrence Kolbe and Michael J. Vilbert).

“The Effect of Debt on the Cost of Equity in a Regulatory Setting,” (with A. Lawrence Kolbe and Michael J. Vilbert, and with “*The Brattle Group*” listed as author), *Edison Electric Institute*, April 2005.

“Communication and Delegation in Collusive Agencies,” *Journal of Accounting and Economics*, Vol. 19, 1995.

“Beta Distributed Market Shares in a Spatial Model with an Application to the Market for Audit Services” (with M. Hviid), *Review of Industrial Organization*, Vol. 10, 1995.

## SELECTED PRESENTATIONS

“FERC’s new ROE methodology for pipelines and electric transmission,” (with Michael J. Vilbert) *UBS Fireside Chat*, June 24, 2020.

“Managing Price Risk for Merchant Renewable Investments,” (with Onur Aydin) *EIA Electricity Pricing Workgroup* (webinar), April 30, 2019.

“Decoupling and its Impact on Cost of Capital” presented to *SURFA Members and Friends*, February 27, 2019.

“Current Issues in Cost of Capital” presented to *EEI Members*, July, 2018-19.

“Introduction to Capital Structure & Liability Management”, *the American Gas Association/Edison Electric Institute “Introduction and Advanced Public Utility Accounting Courses”*, August 2018-2019.

“Lessons from the U.S. and Australia” presented at *Seminar on the Cost of Capital in Regulated Industries: Time for a Fresh Perspective?* Brussels, October 2017.

“Should Regulated Utilities Hedge Fuel Cost and if so, How?” presented at *SURFA’s 49 Financial Forum*, April 20-21, 2017.

“Transmission: The Interplay Between FERC Rate Setting at the Wholesale Level and Allocation to Retail Customers,” (with Mariko Geronimo Aydin) presented at *Law Seminars International: Electric Utility Rate Cases*, March 16-17, 2017.

“Capital Structure and Liability Management,” *American Gas Association and Edison Electric Institute Public Utility Accounting Course*, August 2015-2017.

“Current Issues in Cost of Capital,” *Edison Electric Institute Advanced Rate School*, July 2013-2017.



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“Alternative Regulation and Rate Making Approaches for Water Companies,” *Society of Depreciation Professionals Annual Conference*, September 2014.

“Capital Investments and Alternative Regulation,” *National Association of Water Companies Annual Policy Forum*, December 2013.

“Accounting for Power Plant,” *SNL’s Inside Utility Accounting Seminar*, Charlotte, NC, October 2012.

“GAAP / IFRS Convergence,” *SNL’s Inside Utility Accounting Seminar*, Charlotte, NC, October 2012.

“International Innovations in Rate of Return Determination,” *Society of Utility Financial and Regulatory Analysts’ Financial Forum*, April 2012.

“Utility Accounting and Financial Analysis: The Impact of Regulatory Initiatives on Accounting and Credit Metrics,” 1.5 day seminar, EUCI, Atlanta, May 2012.

“Cost of Capital Working Group Eforum,” *Edison Electric Institute webinar*, April 2012.

“Issues Facing the Global Water Utility Industry” Presented to Sensus’ Executive Retreat, Raleigh, NC, July 2010.

“Regulatory Issues from GAAP to IFRS,” *NASUCA 2009 Annual Meeting*, Chicago, November 2009.

“Subprime Mortgage-Related Litigation: What to Look for and Where to Look,” *Law Seminars International: Damages in Securities Litigation*, Boston, May 2008.

“Evaluating Alternative Business / Inventive Models,” (with Joe Wharton). *EEI Workshop, Making a Business of Energy Efficiency: Sustainable Business Models for Utilities*, Washington DC, December 2007.

“Deferred Income Taxes and IRS’s NOPR: Who should benefit?” *NASUCA Annual Meeting*, Anaheim, CA, November 2007.

“Discussion of ‘Are Performance Measures Other Than Price Important to CEO Incentives?’” *Annual Meeting of the American Accounting Association*, 2000.

“Contracting and Income Smoothing in an Infinite Agency Model: A Computational Approach,” (with R.T. Boylan) *Business and Management Assurance Services Conference*, Austin 2000.

## TESTIMONY

Rebuttal Testimony re. the discount rate for property valuation in tax assessment on behalf of Union Pacific Railroad, *Utah District Court*, Case No. 2:18-cv-00630-DAK\_DBP (Union Pacific Railroad v. Utah State Tax Commission et al), February 2021

Direct Testimony on the cost of equity on behalf of Orange & Rockland Utilities submitted to the *New York Department of Public Service*, Case No. 21-E-0074, January 2021.

## SCHEDULE BV-1

Direct Testimony on the cost of equity on behalf of Nicor Gas submitted to the *Illinois Commerce Commission*, Docket No. 21-XXXX, January 2021.

Direct Testimony on the cost of equity and capital structure on behalf of Anchorage Water and Wastewater Utility submitted to the *Regulatory Commission of Alaska*, Matters TA168-122 and 168-126, December 2020.

Direct Testimony on the cost of equity on behalf of NW Natural submitted to the *Washington Transportation and Utilities Commission*, Docket No. UG-200994, December 2020.

Written Evidence in Review and Variance of Decision 22570-D01-2018 Stage 2 (AltaGas' capital structure) (joint with Paul R. Carpenter) on behalf of AltaGas Utilities Inc. Filed with the *Alberta Utilities Commission*, Proceeding 25031, January 2020.

Written Evidence on Cost of Equity and Capital Structure on behalf of ATCO, AltaGas and FortisAlberta in 2021-2022 Generic Cost of Capital Proceeding. Filed with the *Alberta Utilities Commission*, Proceeding No. 24110, January 2020.

Report on the Return Margin for the Alberta Bottle Depots on behalf of the Alberta Beverage Container Recycling Corporation, February 2020.

Verified Statement and Reply Verified Statement regarding Revisions to the Board's Methodology for Determining the Railroad Industry's Cost of Capital on behalf of the American Association of Railroads before the *Surface Transportation Board*, Docket No. EP 664 (Sub-No. 4), January, February 2020.

Affidavit regarding the creation of a regulatory asset for earthquake related costs on behalf of Anchorage Water and Wastewater submitted to the *Regulatory Commission of Alaska*, December 2019.

Expert Report and Hearing Appearance on Going Concern and Impairment, *American Arbitration Association*: International Engineering & Construction S.A., Greenville Oil & Gas Co. Ltd and GE Oil & Gas, Inc., November, December 2019.

Direct Testimony and Rebuttal Testimony on the cost of equity on behalf of DTE Gas submitted to the *Michigan Public Service Commission*, Docket No. U-20642, November 2019.

Expert Report on IFRS Issues and Forensics. *SIAC Arbitration* No. 44 of 2018, October 2019.

Expert Report, Reply Report and Hearing Appearance on IFRS issues. *ICC Arbitration* No. 23896/GSS, September 2019, September and November 2020.

Direct Testimony on the cost of debt and equity capital as well as capital structure on behalf of Young Brothers, LLC. submitted to the *Public Utilities Commission of the State of Hawaii*, Docket No. 2019-0117, September 2019.

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Direct Testimony on Cost of Equity on behalf of DTE Gas submitted to the *Michigan Public Service Commission*, Docket No. U-20940, February 2021.

Expert Report on discount rates in property tax matter for Union Pacific Company in *Union Pacific Railroad Co. v. Utah State Tax Comm'n, et. al.*, Case No. 2:18-cv-00630-DAK-DBP, Utah August 2019.

Answering Testimony on the Cost of Equity on behalf of Northern Natural Gas Company submitted to the *Federal Energy Regulatory Commission*, Docket No. RP19-59-000, August 2019.

Direct Testimony, Rebuttal Testimony, and Hearing Appearance on Cost of Equity on behalf of DTE Electric Company submitted to the *Michigan Public Service Commission*, Docket No. U-20561, July, November, December 2019.

Prepared Direct Testimony on Cost of Capital for Northern Natural Gas Company submitted to the *Federal Energy Regulatory Commission*, Docket No. RP19-1353-000, July 2019.

Prepared Direct Testimony on Cost of Capital and Term Differentiated Rates for Paiute Pipeline Company submitted to the *Federal Energy Regulatory Commission*, Docket No. RP19-1291-000, May 2019.

Expert report, deposition, and oral trial testimony on behalf of PacifiCorp in the Matter of *PacifiCorp, Inc. v. Utah State Tax Comm'n*, Case No. 180903986 TX, *Utah District Court* April, May, September 2019.

Direct Testimony, Rebuttal Testimony, and hearing appearance on the cost of capital for Southern California Edison submitted to the *California Public Utilities Commission*, Docket No. A.19-04-014, April 2019, August 2019.

Prepared Direct Testimony on the cost of equity for Southern California Edison's transmission assets submitted to the *Federal Energy Regulatory Commission*, Docket No. ER19-1553, April 2019.

Direct and Rebuttal Testimony on cost of equity for Consolidated Edison of New York submitted to the *New York Public Service Commission*, Matter No. 19-00317, January, June 2019.

Direct Testimony on cost of capital and capital structure for Northwest Natural Gas Company submitted to the *Washington Utilities and Transportation Commission*, Docket No. 181053, December 2018.

Pre-filed Direct Testimony and Reply Testimony on cost of capital and capital structure for Anchorage Water Utility and Anchorage Wastewater Utility submitted to the *Regulatory Commission of Alaska*, TA163-122 and TA164-126, December 2018, October 2019.

Direct Testimony on cost of capital for Portland General Electric Company submitted to the *Oregon Public Utility Commission* on behalf of Portland General Electric Company (with Hager and Liddle), UE 335, February 2018.

Direct Testimony and Rebuttal Testimony on cost of capital for NW Natural submitted to the *Oregon Public Utility Commission* on behalf of NW Natural, UG 344, December 2017, May 2018.

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Direct Pre-filed Testimony and Reply Pre-filed Testimony on cost of equity and capital structure for Anchorage Water and Wastewater Utilities before the *Regulatory Commission of Alaska*, TA161-122 and TA162-126, November 2017, September 2018.

Direct Testimony, Rebuttal Testimony, deposition, and hearing appearance on wholesale water rates for Petitioner Cities, *Texas Public Utility Commission*, PUC Docket 46662, SOAH Docket 473-17-4964.WS, November 2017, January, June, July, October 2018.

Affidavit on Lifting the Dividend Restriction for Anchorage Water Utility for AWWU, *Regulatory Commission of Alaska*, U-17-095, November 2017.

Written Evidence, Rebuttal Evidence and Hearing appearance on the Cost of Capital and Capital Structure for the ATCO Utilities and AUI, 2018-2020 Generic Cost of Capital Proceeding, *Alberta Utilities Commission*, October 2017, February – March 2018.

Written Evidence, Rebuttal Evidence, and Hearing Appearance on Regulatory Tax Treatment for the ATCO Utilities and AUI, 201802020 Generic Cost of Capital Proceeding, *Alberta Utilities Commission*, October 2017, February – March 2018.

Affidavit on the Creation of a Regulatory Assets for PRV Rebates for Anchorage Water Utility, submitted to the *Regulatory Commission of Alaska*, U-17-083, August 2017.

Direct and Rebuttal Testimony, Hearing Appearance on Cost of Capital for California-American Water Company for California-American Water submitted to the *California Public Utilities Commission*, Application 17-04-003, April, August, September 2017.

Direct, Rebuttal, Surrebuttal, Supplemental, Supplemental Rebuttal Testimony and Hearing Appearance on the Cost of Capital for Northern Illinois Gas Company submitted to the *Illinois Commerce Commission*, GRM #17-055, March, July, August, September, and November 2017.

Direct and Rebuttal Testimony on Cost of Capital for Portland General Electric Company submitted to the *Oregon Public Utility Commission* on behalf of Portland General Electric Company, Docket No. UE 319, February, July 2017.

Pre-filed Direct and Reply Testimony and Hearing Appearance on Cost of Equity and Capital Structure for Anchorage Municipal Light and Power, *Regulatory Commission of Alaska*, Docket No. TA357-121, December 2016, August and December 2017.

Expert report and Hearing Appearance regarding the Common Equity Ratio for OPG's Regulated Generation for OEB Staff, *Ontario Energy Board*, EB-2016-0152, November 2016, April 2017.

Pre-filed Direct Testimony on Cost of Equity and Capital Structure for Anchorage Municipal Wastewater Utility, *Regulatory Commission of Alaska*, Docket No. 158-126, November 2016.

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Expert Report, Reply Expert Report and Hearing on damages (quantum) in exit arbitration (with Dan Harris), *International Center for the Settlement of Investment Disputes*, October 2016, October 2018, July 2019.

Direct Testimony on capital structure, embedded cost of debt, and income taxes for Detroit Thermal, Michigan Public Service Commission, Docket No. UE-18131, July 2016.

Direct Testimony on return on equity for Arizona Public Service Company, Arizona Corporation Commission, Docket E-01345A-16-0036, June 2016.

Written evidence, rebuttal evidence and hearing appearance regarding the cost of equity and capital structure for Alberta-based utilities, the Alberta Utilities Commission, Proceeding No. 20622 on behalf of AltaGas Utilities Inc., ENMAX Power Corporation, FortisAlberta Inc., and The ATCO Utilities, February, May and June 2016.

Verified Statement, Verified Reply Statement, and Hearing Appearance regarding the cost of capital methodology to be applied to freight railroads, the *Surface Transportation Board* on behalf of the Association of American Railroads, Docket No. EP 664 (Sub-No. 2), July 2015, September and November 2015.

Direct Testimony on cost of capital submitted to the Oregon Public Utility Commission on behalf of Portland General Electric, Docket No. UE 294, February 2015.

Supplemental Direct Testimony and Reply Testimony on cost of capital submitted to the *Regulatory Commission of Alaska* on behalf of Anchorage Water and Wastewater utilities, Docket U-13-202, September 2014, March 2015.

Expert Report and hearing appearance on specific accrual and cash flow items in a Sales and Purchase Agreement in international arbitration before the *International Chamber of Commerce*. Case No. 19651/TO, July and November 2014. (*Confidential*)

Rebuttal Testimony regarding Cost of Capital before the *Oregon Public Utility Commission* on behalf of Portland General Electric, Docket No. UE 283, July 2014.

Direct Testimony on the rate impact of the pension re-allocation and other items for Upper Peninsula Power Company in connection with the acquisition by BBIP before the *Michigan Public Service Commission* in Docket No. U-17564, March 2014.

Expert Report on cost of equity, non-recovery of operating cost and asset retirement obligations on behalf of oil pipeline in arbitration, April 2013. (with A. Lawrence Kolbe, Michael J. Vilbert, *Confidential*)

Direct Testimony on the treatment of goodwill before the *Federal Energy Regulatory Commission* on behalf of ITC Holdings Corp and ITC Midwest, LLC in Docket No. PA10-13-000, February 2012.

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Direct and Rebuttal Testimony on cost of capital before the *Public Utilities Commission of the State of California* on behalf of California-American Water in Application No. 11-05, May 2011.

Direct Testimony, Rebuttal Testimony, and Hearing Appearance on cost of capital before the *New Mexico Public Regulation Commission* on behalf of New Mexico-American Water in Case No. 11-00196-UT, May 2011, November 2011, and December 2011.

Direct Testimony on regulatory assets and FERC accounting before the *Federal Energy Regulatory Commission* on behalf of AWC Companies, EL11-13-000, December 2010.

Expert Report and deposition in Civil Action No. 02-618 (GK/JMF) in the *United States District Court for the District of Columbia*, November 2010, January 2011. (*Confidential*)

Direct Testimony, Rebuttal Testimony, and Rejoinder Testimony on the cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-10-0448, November 2010, July 2011, and August 2011.

Direct Testimony on the cost of capital before the *New Mexico Public Regulation Commission* on behalf of New Mexico-American Water in Docket No. 09-00156-UT, August 2009.

Direct and Rebuttal Testimony and Hearing Appearance on the cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-09-0343, July 2009, March 2010 and April 2010.

Rebuttal Expert Report, Deposition and Oral Testimony re. the impact of alternative discount rate assumptions in tax litigation. *United States Court of Federal Claims*, Case No. 06-628 T, January, February, April 2009. (*Confidential*)

Direct Testimony, Rebuttal Testimony and Hearing Appearance on cost of capital before the *New Mexico Public Regulation Commission* on behalf of New Mexico-American Water in Docket No. 08-00134-UT, June 2008 and January 2009.

Direct Testimony on cost of capital and carrying charge on damages, U.S. Department of Energy, *Bonneville Power Administration*, BPA Docket No. WP-07, March 2008.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony and Hearing Appearance on cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-08-0227, April 2008, February 2009, March 2009.

Expert Report, Supplemental Expert Report, and Hearing Appearance on the allocation of corporate overhead and damages from lost profit. *The International Centre for the Settlement of Investment Disputes*, Case No. ARB/03/29, February, April, and June 2008 (*Confidential*).

Expert Report on accounting information needed to assess income. *United States District Court* for the District of Maryland (Baltimore Division), Civil No. 1:06cv02046-JFM, June 2007 (*Confidential*)

Expert Report, Rebuttal Expert Report, and Hearing Appearance regarding investing activities, impairment of assets, leases, shareholder' equity under U.S. GAAP and valuation. *International Chamber*

## SCHEDULE BV-1

*of Commerce* (ICC), Case No. 14144/CCO, May 2007, August 2007, September 2007. (Joint with Carlos Lapuerta, *Confidential*)

Direct Testimony, Rebuttal Testimony, and Hearing Appearance on cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-06-0491, July 2006, July 2007.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony, Supplemental Rejoinder Testimony and Hearing Appearance on cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-06-0403, June 2006, April 2007, May 2007.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony, and Hearing Appearance on cost of capital before *the Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-06-0014, January 2006, October 2006, November 2006.

Expert report, rebuttal expert report, and deposition on behalf of a major oil company regarding the equity method of accounting and classification of debt and equity, *American Arbitration Association*, August 2004 and November 2004. (*Confidential*).

## Calculation of Comparable ROE Summary (XLU Index)

	2020	2021	2022	2023	2024	2020-2024 Average	2021-2024 Average
<b>Weighted Average</b>	9.9%	11.0%	11.1%	11.3%	11.4%	10.9%	11.2%
<b>Safe Harbor</b>	11.9%	13.0%	13.1%	13.3%	13.4%	12.9%	13.2%
<b>Standard Deviation</b>	3.0%	7.4%	7.7%	8.0%	8.2%	6.8%	7.8%
<b>Standard Deviation Multiplier (95% Confidence)</b>	1.645	1.645	1.645	1.645	1.645	1.645	1.645
<b>SEET Threshold</b>	14.8%	23.2%	23.8%	24.4%	24.9%	22.2%	24.1%
<b>Simple Average</b>	10.0%	12.6%	12.8%	12.9%	13.0%	12.3%	12.8%
<b>Safe Harbor</b>	12.0%	14.6%	14.8%	14.9%	15.0%	14.3%	14.8%
<b>Standard Deviation</b>	3.0%	7.4%	7.7%	8.0%	8.2%	6.8%	7.8%
<b>Standard Deviation Multiplier (95% Confidence)</b>	1.645	1.645	1.645	1.645	1.645	1.645	1.645
<b>SEET Threshold</b>	14.9%	24.8%	25.4%	26.0%	26.5%	23.5%	25.7%

Source: Value Line Reports as of February 12, 2021 and Value Line CSF data as of February 12, 2021.



## 2020 Calculation of Comparable ROE (\$mil)

Company	Ticker	Common Equity			Net Income 2020	ROE 2020
		12/31/2019	12/31/2020	Average		
Ameren Corporation	AEE	8,059	9,045	8,552	870	10.2%
American Electric Power Company Inc	AEP	19,632	20,470	20,051	2,125	10.6%
AES Corporation	AES	3,884	2,040	2,962	-	0.0%
Atmos Energy Corporation	ATO	6,791	6,795	6,793	581	8.5%
American Water Works Company Inc	AWK	6,116	6,541	6,328	708	11.2%
CMS Energy Corporation	CMS	5,018	5,520	5,269	765	14.5%
CenterPoint Energy Inc	CNP	6,581	5,968	6,274	885	14.1%
Dominion Energy Inc	D	29,607	23,277	26,442	2,695	10.2%
DTE Energy Company	DTE	11,672	12,344	12,008	1,310	10.9%
Duke Energy Corporation	DUK	44,860	46,202	45,531	3,080	6.8%
Consolidated Edison Inc	ED	18,022	18,975	18,499	1,320	7.1%
Edison International	EIX	13,303	13,874	13,589	755	5.6%
Eversource Energy	ES	12,630	14,853	13,742	1,230	9.0%
Entergy Corporation	ETR	10,224	10,815	10,519	1,155	11.0%
Evergy Inc	EVRG	8,572	8,694	8,633	615	7.1%
Exelon Corporation	EXC	32,224	33,144	32,684	2,905	8.9%
FirstEnergy Corp	FE	6,975	7,242	7,109	950	13.4%
Alliant Energy Corporation	LNT	5,205	5,040	5,123	610	11.9%
NextEra Energy Inc	NEE	37,005	36,479	36,742	4,127	11.2%
NiSource Inc	NI	5,107	7,064	6,086	490	8.1%
Public Service Enterprise Group Inc	PEG	15,089	15,886	15,488	1,730	11.2%
Pinnacle West Capital Corporation	PNW	5,431	5,628	5,529	575	10.4%
PPL Corporation	PPL	12,991	13,436	13,213	1,790	13.5%
Southern Company	SO	27,505	27,947	27,726	3,355	12.1%
Sempra Energy	SRE	17,671	21,089	19,380	2,270	11.7%
WEC Energy Group Inc	WEC	10,113	10,486	10,300	1,190	11.6%
Xcel Energy Inc	XEL	13,239	14,771	14,005	1,480	10.6%
				Weighted	Simple	
				Average	9.9%	10.0%
				Safe Harbor	11.9%	12.0%
				Standard Deviation	3.0%	3.0%
				Standard Deviation Multiplier (95% Confidence)	1.645	1.645
				SEET Threshold	14.8%	14.9%

Source: Value Line Reports as of February 12, 2021 and Value Line CSF data as of February 12, 2021.

Note: Brattle has removed NRG Energy (negative net income). ROE is net income over the average of common equity. The Safe Harbor is the average ROE plus an adder of 2%, and the SEET Threshold is the product of the standard deviation and the respective 95% confidence multiplier plus the average ROE. Historical common equity from Value Line may differ from the common equity reported in the company's 10K documents.

## 2021 Calculation of Comparable ROE (\$mil)

Company	Ticker	Common Equity			Net Income 2021	ROE 2021
		12/31/2020	12/31/2021	Average		
Ameren Corporation	AEE	9,045	9,753	9,399	965	10.3%
American Electric Power Company Inc	AEP	20,470	22,073	21,271	2,335	11.0%
AES Corporation	AES	2,040	2,130	2,085	1,000	48.0%
Atmos Energy Corporation	ATO	6,795	7,560	7,178	645	9.0%
American Water Works Company Inc	AWK	6,541	6,880	6,710	775	11.5%
CMS Energy Corporation	CMS	5,520	6,068	5,794	830	14.3%
CenterPoint Energy Inc	CNP	5,968	7,127	6,547	1,005	15.4%
Dominion Energy Inc	D	23,277	25,659	24,468	3,115	12.7%
DTE Energy Company	DTE	12,344	12,870	12,607	1,380	10.9%
Duke Energy Corporation	DUK	46,202	47,571	46,886	4,065	8.7%
Consolidated Edison Inc	ED	18,975	20,213	19,594	1,490	7.6%
Edison International	EIX	13,874	14,668	14,271	1,730	12.1%
Eversource Energy	ES	14,853	15,633	15,243	1,350	8.9%
Entergy Corporation	ETR	10,815	11,454	11,134	1,225	11.0%
Evergy Inc	EVRG	8,694	8,906	8,800	730	8.3%
Exelon Corporation	EXC	33,144	34,613	33,878	2,935	8.7%
FirstEnergy Corp	FE	7,242	7,943	7,593	1,500	19.8%
Alliant Energy Corporation	LNT	5,040	5,280	5,160	655	12.7%
NextEra Energy Inc	NEE	36,479	39,552	38,016	4,385	11.5%
NiSource Inc	NI	7,064	7,247	7,156	530	7.4%
Public Service Enterprise Group Inc	PEG	15,886	16,673	16,280	1,845	11.3%
Pinnacle West Capital Corporation	PNW	5,628	5,863	5,746	585	10.2%
PPL Corporation	PPL	13,436	14,090	13,763	1,885	13.7%
Southern Company	SO	27,947	28,694	28,320	3,470	12.3%
Sempra Energy	SRE	21,089	24,168	22,629	2,600	11.5%
WEC Energy Group Inc	WEC	10,486	10,818	10,652	1,260	11.8%
Xcel Energy Inc	XEL	14,771	15,543	15,157	1,600	10.6%
				Weighted	Simple	
				Average	11.0%	12.6%
				Safe Harbor	13.0%	14.6%
				Standard Deviation	7.4%	7.4%
				Standard Deviation Multiplier (95% Confidence)	1.645	1.645
				SEET Threshold	23.2%	24.8%

Source: Value Line Reports as of February 12, 2021.

Note: Brattle has removed NRG Energy (negative net income). ROE is net income over the average of common equity. The Safe Harbor is the average ROE plus an adder of 2%, and the SEET Threshold is the product of the standard deviation and the respective 95% confidence multiplier plus the average ROE.

## 2022 Calculation of Comparable ROE (\$mil)

Company	Ticker	Common Equity			Net Income 2022	ROE 2022
		12/31/2021	12/31/2022	Average		
Ameren Corporation	AEE	9,753	10,512	10,132	1,050	10.4%
American Electric Power Company Inc	AEP	22,073	24,182	23,127	2,557	11.1%
AES Corporation	AES	2,130	2,240	2,185	1,098	50.3%
Atmos Energy Corporation	ATO	7,560	8,240	7,900	720	9.1%
American Water Works Company Inc	AWK	6,880	7,320	7,100	825	11.6%
CMS Energy Corporation	CMS	6,068	6,613	6,341	910	14.4%
CenterPoint Energy Inc	CNP	7,127	8,024	7,575	1,052	13.9%
Dominion Energy Inc	D	25,659	27,813	26,736	3,420	12.8%
DTE Energy Company	DTE	12,870	14,086	13,478	1,505	11.2%
Duke Energy Corporation	DUK	47,571	48,499	48,035	4,255	8.9%
Consolidated Edison Inc	ED	20,213	21,087	20,650	1,590	7.7%
Edison International	EIX	14,668	15,591	15,130	1,820	12.0%
Eversource Energy	ES	15,633	16,473	16,053	1,445	9.0%
Entergy Corporation	ETR	11,454	12,140	11,797	1,310	11.1%
Evergy Inc	EVRG	8,906	9,215	9,061	792	8.7%
Exelon Corporation	EXC	34,613	36,181	35,397	3,105	8.8%
FirstEnergy Corp	FE	7,943	9,247	8,595	1,610	18.7%
Alliant Energy Corporation	LNT	5,280	5,520	5,400	700	13.0%
NextEra Energy Inc	NEE	39,552	41,513	40,532	4,710	11.6%
NiSource Inc	NI	7,247	7,382	7,315	615	8.4%
Public Service Enterprise Group Inc	PEG	16,673	17,690	17,182	1,950	11.3%
Pinnacle West Capital Corporation	PNW	5,863	6,206	6,034	627	10.4%
PPL Corporation	PPL	14,090	14,763	14,427	1,970	13.7%
Southern Company	SO	28,694	31,301	29,997	3,675	12.3%
Sempra Energy	SRE	24,168	25,455	24,812	2,855	11.5%
WEC Energy Group Inc	WEC	10,818	11,195	11,006	1,340	12.2%
Xcel Energy Inc	XEL	15,543	16,518	16,030	1,720	10.7%
				Weighted	Simple	
				Average	11.1%	12.8%
				Safe Harbor	13.1%	14.8%
				Standard Deviation	7.7%	7.7%
Standard Deviation Multiplier (95% Confidence)				1.645	1.645	
SEET Threshold				23.8%	25.4%	

Source: Value Line Reports as of February 12, 2021.

Note: Brattle has removed NRG Energy (negative net income). ROE is net income over the average of common equity. The Safe Harbor is the average ROE plus an adder of 2%, and the SEET Threshold is the product of the standard deviation and the respective 95% confidence multiplier plus the average ROE.

## 2023 Calculation of Comparable ROE (\$mil)

Company	Ticker	Common Equity			Net Income 2023	ROE 2023
		12/31/2022	12/31/2023	Average		
Ameren Corporation	AEE	10,512	11,270	10,891	1,135	10.4%
American Electric Power Company Inc	AEP	24,182	26,291	25,237	2,778	11.0%
AES Corporation	AES	2,240	2,350	2,295	1,197	52.1%
Atmos Energy Corporation	ATO	8,240	8,920	8,580	795	9.3%
American Water Works Company Inc	AWK	7,320	7,760	7,540	875	11.6%
CMS Energy Corporation	CMS	6,613	7,158	6,885	990	14.4%
CenterPoint Energy Inc	CNP	8,024	8,921	8,472	1,098	13.0%
Dominion Energy Inc	D	27,813	29,671	28,742	3,628	12.6%
DTE Energy Company	DTE	14,086	15,301	14,694	1,630	11.1%
Duke Energy Corporation	DUK	48,499	49,965	49,232	4,463	9.1%
Consolidated Edison Inc	ED	21,087	21,931	21,509	1,685	7.8%
Edison International	EIX	15,591	16,514	16,053	1,910	11.9%
Eversource Energy	ES	16,473	17,422	16,948	1,563	9.2%
Entergy Corporation	ETR	12,140	12,827	12,484	1,395	11.2%
Eversource Energy	EVRG	9,215	9,524	9,369	853	9.1%
Exelon Corporation	EXC	36,181	37,849	37,015	3,252	8.8%
FirstEnergy Corp	FE	9,247	10,596	9,922	1,763	17.8%
Alliant Energy Corporation	LNT	5,520	5,760	5,640	745	13.2%
NextEra Energy Inc	NEE	41,513	45,355	43,434	5,307	12.2%
NiSource Inc	NI	7,382	7,517	7,450	700	9.4%
Public Service Enterprise Group Inc	PEG	17,690	18,660	18,175	2,048	11.3%
Pinnacle West Capital Corporation	PNW	6,206	6,548	6,377	668	10.5%
PPL Corporation	PPL	14,763	15,608	15,185	2,032	13.4%
Southern Company	SO	31,301	32,398	31,849	3,933	12.3%
Sempra Energy	SRE	25,455	26,741	26,098	3,110	11.9%
WEC Energy Group Inc	WEC	11,195	11,573	11,384	1,420	12.5%
Xcel Energy Inc	XEL	16,518	17,493	17,005	1,840	10.8%
				Weighted	Simple	
				Average	11.3%	12.9%
				Safe Harbor	13.3%	14.9%
				Standard Deviation	8.0%	8.0%
				Standard Deviation Multiplier (95% Confidence)	1.645	1.645
				SEET Threshold	24.4%	26.0%

Source: Value Line Reports as of February 12, 2021.

Note: Brattle has removed NRG Energy (negative net income). ROE is net income over the average of common equity. The Safe Harbor is the average ROE plus an adder of 2%, and the SEET Threshold is the product of the standard deviation and the respective 95% confidence multiplier plus the average ROE.

## 2024 Calculation of Comparable ROE (\$mil)

Company	Ticker	Common Equity			Net Income 2024	ROE 2024
		12/31/2023	12/31/2024	Average		
Ameren Corporation	AEE	11,270	12,028	11,649	1,220	10.5%
American Electric Power Company Inc	AEP	26,291	28,401	27,346	3,000	11.0%
AES Corporation	AES	2,350	2,460	2,405	1,295	53.8%
Atmos Energy Corporation	ATO	8,920	9,600	9,260	870	9.4%
American Water Works Company Inc	AWK	7,760	8,200	7,980	925	11.6%
CMS Energy Corporation	CMS	7,158	7,703	7,430	1,070	14.4%
CenterPoint Energy Inc	CNP	8,921	9,818	9,369	1,145	12.2%
Dominion Energy Inc	D	29,671	31,529	30,600	3,837	12.5%
DTE Energy Company	DTE	15,301	16,517	15,909	1,755	11.0%
Duke Energy Corporation	DUK	49,965	51,430	50,698	4,672	9.2%
Consolidated Edison Inc	ED	21,931	22,774	22,353	1,780	8.0%
Edison International	EIX	16,514	17,438	16,976	2,000	11.8%
Eversource Energy	ES	17,422	18,370	17,896	1,682	9.4%
Entergy Corporation	ETR	12,827	13,514	13,170	1,480	11.2%
Evergy Inc	EVRG	9,524	9,833	9,678	915	9.5%
Exelon Corporation	EXC	37,849	39,516	38,683	3,398	8.8%
FirstEnergy Corp	FE	10,596	11,945	11,271	1,917	17.0%
Alliant Energy Corporation	LNT	5,760	6,000	5,880	790	13.4%
NextEra Energy Inc	NEE	45,355	49,198	47,276	5,903	12.5%
NiSource Inc	NI	7,517	7,652	7,585	785	10.3%
Public Service Enterprise Group Inc	PEG	18,660	19,630	19,145	2,147	11.2%
Pinnacle West Capital Corporation	PNW	6,548	6,891	6,719	710	10.6%
PPL Corporation	PPL	15,608	16,453	16,030	2,093	13.1%
Southern Company	SO	32,398	33,496	32,947	4,192	12.7%
Sempra Energy	SRE	26,741	28,028	27,385	3,365	12.3%
WEC Energy Group Inc	WEC	11,573	11,951	11,762	1,500	12.8%
Xcel Energy Inc	XEL	17,493	18,468	17,980	1,960	10.9%
				Weighted	Simple	
				Average	11.4%	13.0%
				Safe Harbor	13.4%	15.0%
				Standard Deviation	8.2%	8.2%
				Standard Deviation Multiplier (95% Confidence)	1.645	1.645
				SEET Threshold	24.9%	26.5%

Source: Value Line Reports as of February 12, 2021.

Note: Brattle has removed NRG Energy (negative net income). ROE is net income over the average of common equity. The Safe Harbor is the average ROE plus an adder of 2%, and the SEET Threshold is the product of the standard deviation and the respective 95% confidence multiplier plus the average ROE.

Derivation of Common Equity and Net Income

Company	Ticker	Report Date	Total Capital (\$mill)					Common Equity %					Common Equity (\$mill)					Net Income (\$mill)							
			2020	2021	2022	2024	2025	2020	2021	2022	2024	2025	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024	12/31/2025	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024	12/31/2025	
Ameren Corporation	AEE	12/11/2020	20,325	20,975		24,800		44.5%	46.5%		48.5%	9,045	9,753	10,512	11,270	12,028		870	965	1,050	1,135	1,220			
American Electric Power Company Inc	AEP	12/11/2020	49,325	54,500		71,900		41.5%	40.5%		39.5%	20,470	22,073	24,182	26,291	28,401		2,125	2,335	2,557	2,778	3,000			
AES Corporation	AES	12/18/2020										2,040	2,130	2,240	2,350	2,460		-	1,000	1,098	1,197	1,295			
Atmos Energy Corporation	ATO	11/27/2020	11,325	12,600		16,000		60.0%	60.0%		60.0%	6,795	7,560	8,240	8,920	9,600		581	645	720	795	870			
American Water Works Company Inc	AWK	1/8/2021	16,150	17,200		20,000		40.5%	40.0%		41.0%	6,541	6,880	7,320	7,760	8,200		708	775	825	875	925			
CMS Energy Corporation	CMS	12/11/2020	18,400	19,575		23,700		30.0%	31.0%		32.5%	5,520	6,068	6,613	7,158	7,703		765	830	910	990	1,070			
CenterPoint Energy Inc	CNP	12/11/2020	19,250	20,075		23,100		31.0%	35.5%		42.5%	5,968	7,127	8,024	8,921	9,818		885	1,005	1,052	1,098	1,145			
Dominion Energy Inc	D	2/12/2021	57,475	60,375	62,500		71,800		40.5%	42.5%	44.5%		46.5%	23,277	25,659	27,813	29,671	31,529	33,387	2,695	3,115	3,420	3,628	3,837	4,045
DTE Energy Company	DTE	12/11/2020	31,250	33,000		39,800		39.5%	39.0%		41.5%	12,344	12,870	14,086	15,301	16,517		1,310	1,380	1,505	1,630	1,755			
Duke Energy Corporation	DUK	2/12/2021	103,825	106,900	110,225		121,600		44.5%	44.5%	44.0%		43.5%	46,202	47,571	48,499	49,965	51,430	52,896	3,080	4,065	4,255	4,463	4,672	4,880
Consolidated Edison Inc	ED	2/12/2021	37,575	41,250	42,600		48,200		50.5%	49.0%	49.5%		49.0%	18,975	20,213	21,087	21,931	22,774	23,618	1,320	1,490	1,590	1,685	1,780	1,875
Edison International	EIX	1/22/2021	35,125	38,600		46,500		39.5%	38.0%		37.5%	13,874	14,668	15,591	16,514	17,438		755	1,730	1,820	1,910	2,000			
Eversource Energy	ES	2/12/2021	36,675	38,600	40,675		47,700		40.5%	40.5%	40.5%		40.5%	14,853	15,633	16,473	17,422	18,370	19,319	1,230	1,350	1,445	1,563	1,682	1,800
Entergy Corporation	ETR	12/11/2020	30,900	32,725		35,100		35.0%	35.0%		38.5%	10,815	11,454	12,140	12,827	13,514		1,155	1,225	1,310	1,395	1,480			
Evergy Inc	EVRG	12/11/2020	17,925	18,750		20,700		48.5%	47.5%		47.5%	8,694	8,906	9,215	9,524	9,833		615	730	792	853	915			
Exelon Corporation	EXC	2/12/2021	69,050	69,925	74,600		83,200		48.0%	49.5%	48.5%		49.5%	33,144	34,613	36,181	37,849	39,516	41,184	2,905	2,935	3,105	3,252	3,398	3,545
FirstEnergy Corp	FE	2/12/2021	30,175	31,150	33,025		39,100		24.0%	25.5%	28.0%		34.0%	7,242	7,943	9,247	10,596	11,945	13,294	950	1,500	1,610	1,763	1,917	2,070
Alliant Energy Corporation	LNT	12/11/2020	10,500	11,000		12,500		48.0%	48.0%		48.0%	5,040	5,280	5,520	5,760	6,000		610	655	700	745	790			
NextEra Energy Inc	NEE	2/12/2021	78,450	82,400	88,325		110,500		46.5%	48.0%	47.0%		48.0%	36,479	39,552	41,513	45,355	49,198	53,040	4,127	4,385	4,710	5,307	5,903	6,500
NiSource Inc	NI	11/27/2020	15,875	16,105		17,005		44.5%	45.0%		45.0%	7,064	7,247	7,382	7,517	7,652		490	530	615	700	785			
Public Service Enterprise Group Inc	PEG	2/12/2021	30,550	32,375	34,350		41,200		52.0%	51.5%	51.5%		50.0%	15,886	16,673	17,690	18,660	19,630	20,600	1,730	1,845	1,950	2,048	2,147	2,245
Pinnacle West Capital Corporation	PNW	1/22/2021	11,975	13,175		16,025		47.0%	44.5%		43.0%	5,628	5,863	6,206	6,548	6,891		575	585	627	668	710			
PPL Corporation	PPL	2/12/2021	34,450	35,225	35,150		40,700		39.0%	40.0%	42.0%		42.5%	13,436	14,090	14,763	15,608	16,453	17,298	1,790	1,885	1,970	2,032	2,093	2,155
Southern Company	SO	2/12/2021	74,525	77,550	81,300		88,700		37.5%	37.0%	38.5%		39.0%	27,947	28,694	31,301	32,398	33,496	34,593	3,355	3,470	3,675	3,933	4,192	4,450
Sempra Energy	SRE	1/22/2021	46,350	48,825		57,200		45.5%	49.5%		49.0%	21,089	24,168	25,455	26,741	28,028		2,270	2,600	2,855	3,110	3,365			
WEC Energy Group Inc	WEC	12/11/2020	22,075	23,775		25,700		47.5%	45.5%		46.5%	10,486	10,818	11,195	11,573	11,951		1,190	1,260	1,340	1,420	1,500			
Xcel Energy Inc	XEL	1/22/2021	34,350	35,325		41,500		43.0%	44.0%		44.5%	14,771	15,543	16,518	17,493	18,468		1,480	1,600	1,720	1,840	1,960			

Source Value Line Reports as of February 12, 2021.

Note Brattle has removed NRG Energy (negative net income). 2024 financial data represents Value Line long term forecasts; some Value Line long term reports project out additional financial data for 2025. 2022 and 2023 data represents a weighted average between 2021 and 2024. For companies in which Value Line has additional years worth of data, 2023 and 2024 data represents a weighted average between 2022 and 2025. AES Corporation (AES) financial data represents shareholders' equity, as common equity forecasts are not provided. The net income item is derived from the 'Net Profit' line from Value Line reports.

### **CERTIFICATE OF SERVICE**

I hereby certify that Ohio Edison Company, The Cleveland Electric Illuminating Company, and the Toledo Edison Company filed the foregoing document electronically through the Docketing Information System of the Public Utilities Commission of Ohio on this 1st day of March 2021. The PUCO's e-filing system will electronically serve notice of the filing of this document on counsel for all parties.

/s/ Brian J. Knipe

*An Attorney for Ohio Edison Company, The  
Cleveland Electric Illuminating Company and The  
Toledo Edison Company*

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**3/1/2021 4:24:59 PM**

**in**

**Case No(s). 18-0857-EL-UNC, 19-1338-EL-UNC, 20-1034-EL-UNC, 20-1476-EL-UNC**

Summary: Testimony - Direct Testimony of Dr. Bente Villadsen electronically filed by Ms. Margaret Dengler on behalf of Ohio Edison Company and The Cleveland Electric Illuminating Company and The Toledo Edison Company