Table of Contents

I. Introduction and Summary

1 **Q. Please state your name, occupation and business address.**

2 A. My name is Bente Villadsen and I am a principal at The Brattle Group (Brattle). My

3   business address is The Brattle Group, 44 Brattle Street, Cambridge, MA 02138, USA.

4 **Q. Please summarize your background as it pertains to this matter.**

5 A. I have more than 15 years of experience consulting on regulatory finance for regulated

6   infrastructure companies in the electric, natural gas, railroad, water and wastewater

7   industries.   I have provided expert reports and testified on cost of capital in many

8   jurisdictions including state regulatory settings, Bonneville Power Authority, U.S. and

9   international arbitrations, U.S. federal court, and in Australia, Canada, Italy, and the

10   Netherlands.   This work has pertained to electric utilities, pipelines, railroads,

11   telecommunications, water and wastewater utilities. Examples of my recent cost of capital

12   work include reports or testimony on the cost of capital methodology for Australian

13   pipelines before the Australian Energy Regulator, cost of equity for regulated U.S. water

14   utilities and a Canadian pipeline in arbitration. I am an instructor at Edison Electric

15   Institute's Advanced Rate School teaching "Current Issues in Cost of Capital." I hold a

16   Ph.D. from Yale University and joint MS and BS degrees in mathematics and economics

17   from University of Aarhus, Denmark.   My full resume is provided as PGE Exhibit 2001.

18 **Q. What is the purpose of your rebuttal testimony?**

19 A. I have been asked by Portland General Electric (PGE) to review the direct testimony of Dr.

20   Thomas M. Zepp (Zepp Testimony) on behalf of PGE, the Opening Testimony of Michael

21   P. Gorman (Gorman Testimony) on behalf of Industrial Customers of Northwest Utilities

1   (ICNU), the Opening Testimony of Matt Muldoon (Staff Testimony) on behalf of Staff and

2   to (i) provide a recommendation regarding the reasonableness of the recommendation of the

3   Zepp Testimony and PGE's requested return on equity (ROE) and (ii) comment on the

4   Gorman Testimony and Staff Testimony.

5   **Q. Did you file direct testimony in this case?**

6   A. No.   Direct Testimony on cost of capital was filed by Dr. Thomas M. Zepp (Zepp

7   Testimony) on behalf of Portland General Electric.   I adopt his recommendation and

8   comment on why the ROE recommendation of 10.5% is reasonable below.[1]

9   **Q. What are your views on Dr. Zepp's Direct Testimony and PGE's request?**

10   A. I agree with Dr. Zepp's recommendation that a reasonable range for the cost of equity for an

11   integrated electric utility is 9.9% to 10.6% and that PGE faces more risk than the average of

12   his sample. Therefore, the Zepp Testimony's recommendation of 10.5% ROE is reasonable.

13   In fact, I believe that PGE's request for an ROE of 10% is in the low end of what is

14   reasonable, given PGE's higher than average risks.

15   **Q. Please summarize your rebuttal testimony.**

16   A. First and foremost, I find the recommendation of Dr. Zepp and the request of PGE to be

17   consistent with the current evidence on cost of equity. I believe PGE's requested ROE is in

18   the low end of what is currently reasonable given PGE's risk profile. Second, neither the

19   Staff Testimony nor the Gorman Testimony considers PGE-specific risks that indicate

20   PGE's cost of equity is above that of the samples' averages.   The recommended ROE is

21   therefore downward biased. Third, the Staff Testimony does not consider information from

---

[1] I note that in connection with the California Public Utilities Commission's three year review of water utilities' cost of equity and capital structure, Dr. Zepp and I both appeared as witnesses for the water utilities and agreed on the magnitude of the ROE. See the consolidated docket A.11-05-001 to A.11-05-004.

UE 283 General Rate Case – Reply Testimony

1   models other than the multi-stage DCF, which causes the testimony to ignore information

2   from current market conditions. Fourth, the Staff Testimony compares its recommendation

3   to the allowed ROE during Q1, 2014 and eliminates Virginia-specific generation ROEs,

4   which are higher than that national average.[2]   However, if unique ROE allowances for

5   generation facilities are to be eliminated, it is also necessary to eliminate the allowed ROEs

6   for the distribution and transmission only entities, which are not comparable to PGE. Doing

7   so results in an allowed ROE average of 10%, which is comparable to the allowed ROE for

8   all electric utilities and similar to PGE's requested ROE. Fifth, there are a number of

9   technical details in the Gorman Testimony and Staff Testimony that are misguided. I

10   comment on those in the last section.

11   In summary, if I correct Staff's and Gorman's ROE estimates and take the PGE-specific

12   risk into account, the modified ROE estimates confirm the range obtained by Zepp and

13   PGE's ROE request is well within the estimated ranges.

---

[2] Staff Testimony pp.18-20.
UE 283 General Rate Case – Reply Testimony

II. Why the Recommendation of Dr. Zepp and PGE's Request is Reasonable.

1 **Q. Please summarize the recommendations of all witnesses.**

2 A. The *estimated* ROE and the recommended ROE is shown in Table 1 below.

Table 1: Estimate and Recommended ROEs

		Range for ROE			Recommended ROE
Company Request	[1]	NA		NA	10.0%
Zepp Testimony	[2]	9.9%	-	10.6%	10.5%
Staff Testimony	[3]	8.8%	-	9.6%	9.2%
Gorman Testimony	[4]	8.6%	-	10.05%	9.4%

Sources and Notes:
[1]: UE 283 General Rate Case - Direct testimony p. 2
[2]: Zepp Testimony p. 1,
[3]: Staff Testimony p. 20,
[4]: Gorman Testimony pp. 20, 26, 31-32

3 Regarding the recommendations, I note several factors that biases Staff's

4 recommendation downward: (i) Staff relied exclusively on a multi-stage DCF model, (ii)

5 Staff inappropriately eliminates generation incentive ROE but no other non-comparable

6 decisions when considering the recently allowed ROE for electric utilities, (iii) Staff selected

7 a group of smaller entities and ignored utilities that may be appropriate comparable

8 companies, and (iv) Staff has some technical errors in their analysis.[3]   If I revise Staff's

9 estimates to take the factors above into consideration, the revised estimates are 25 to 67

10 basis points higher. Mr. Gorman estimated an ROE of 9.05% using his DCF models, 9.70%

---

[3] For example, Staff calculated the growth rate from 2011-13 to 2016-18 based on the historical forecasted EPS for 2011-13 rather than the realized EPS. Because 2012 EPS on average were lower than expected and growth rates have been updated to take this into account, the relied upon growth rates are downward biased. For Staff's model Y, the ROE would be up to 25 basis points higher had the realized EPS for 2012 been used instead of the forecasted EPS.

1   using his risk premium model and 9.60% using his CAPM.[4]   Two of his three

2   methodologies result in an ROE above the recommended 9.4% and had Mr. Gorman relied

3   upon the average from his models or the median from those models, his recommendation

4   would increase to 9.5 or 9.6%.   Further, the Gorman Testimony contains some technical

5   errors that bias the estimates downward.   If I correct the technical errors, the estimation

6   results increase to about 9.7% to 9.9%.   Taking the unique risks into account either by

7   adding a number of basis points or using the high end of the estimates results in an estimate

8   of about 9.9%.

9   Neither Staff nor Gorman considers the risk of PGE relative to the selected sample

10   companies. Overall, I consider the recommendations of both Staff and Gorman too low.

11   **Q.   Please comment on Dr. Zepp's recommendation.**

12   A.   I find the estimated range of 9.9% to 10.6% to be reasonable in the current environment. It

13   is consistent with what has recently been awarded to other electric utilities and given PGE's

14   unique risks from a large construction program and relative large reliance on power

15   purchase agreements, PGE should be placed towards the upper end of the range. Further,

16   the estimation techniques relied upon by Dr. Zepp are commonly used in regulatory cost of

17   capital proceedings. I agree with Dr. Zepp assessment that PGE's requested ROE of 10.0%

18   is conservative for several reasons. It is towards the lower end of the range estimated by Dr.

19   Zepp and slightly below the average ROE allowed for electric utilities in Q1, 2014 and for

20   utilities in the comparable samples.[5] It is also consistent with PGE's allowed ROE in its last

21   rate case, just one year ago.

---

[4] Gorman Testimony p. 32.

[5] See *Regulatory Research Associates*, "Major Rate Case Decisions – January – March 2014," April 9, 2014.

UE 283 General Rate Case – Reply Testimony

1   Q.   **What other preliminary comments do you have on the sample selections and**

2   **estimation techniques relied upon in the testimonies of Zepp, Staff and Gorman?**

3   A.   First, I would preliminarily point out that Mr. Gorman adopts Dr. Zepp's sample of 20

4   electric utilities (the Zepp / Gorman sample). In contrast, Staff relies on a sample of only

5   eight electric utilities (Staff sample) of which only four overlap the Zepp / Gorman sample.

6   Second, while the Zepp Testimony takes PGE-specific characteristics into account, neither

7   the Staff nor the Gorman Testimony considers the risks specific to PGE.   Third, the

8   estimation techniques differ substantially.   The Zepp Testimony as well as the Gorman

9   Testimony relies on several different model types that use different types of information,

10   while the Staff Testimony relies exclusively on multi-stage DCF models. Specifically, the

11   Zepp Testimony relies on constant growth, two-stage and three-stage DCF models along

12   with three versions of the risk premium model. Because Dr. Zepp relies on both DCF and

13   risk premium models, he captured information from company-specific forecasts, industry,

14   and market conditions.   In contrast, Staff's Testimony referenced only the three-stage DCF

15   models and therefore the relied-upon information is less broad. The Gorman Testimony

16   relies on versions of the constant growth, sustainable growth, and multi-stage DCF models

17   as well as two versions of the risk premium and Capital Asset Pricing (CAPM) Model. The

18   technical details of the relied-upon models and the impact of specific choices on the

19   estimated ROE are discussed in Section VI below.

III.   Intervenors' Failure to Consider PGE-Specific Risk.

20   Q.   **Please explain what specific risks PGE faces.**

UE 283 General Rate Case – Reply Testimony

1   A.   While there are several company-specific risk factors, I shall focus on three key risks: (1)

2   PGE has a large capital expenditure program relative to its peers, (2) PGE needs to rely

3   more heavily on Power Purchase Agreements (PPA) than the sample companies, and (3)

4   PGE is smaller than the companies in Staff's sample. These three characteristics increase

5   PGE's risk.

6   **Q.   Why do large capital expenditures increase risk?**

7   A.   Fundamentally, the "true cost of capital depends on project risk, not on the company

8   undertaking the project."[6] A company engaged in a large capital expenditure program,

9   especially if the capital expenditures pertain to new projects, is weighing its portfolio of

10   capital investments towards newer (less tried and true) projects that have risks, and hence, a

11   cost of capital that are higher than that of established capital projects. This is due to the

12   risks inherent in completion, operation, and integration of these projects. Therefore, a

13   company that is engaged in a relatively large capital expenditure program will have higher

14   risk. Credit rating agencies such as Standard & Poor's (S&P) recognize that PGE has

15   significant financial risk and cite the ongoing capital expenditure program as one reason.[7]

16   **Q.   How does PGE's capital expenditure compare to that of comparable companies?**

17   A.   PGE Exhibit 2002 shows capital expenditures (CapEx) as a percentage of net property, plant

18   and equipment (net PPE) for all companies in the Zepp / Gorman sample and for Staff's

19   sample. It is clear from PGE Exhibit 2002 that PGE has relatively higher capital

20   expenditures than the sample companies in the Zepp / Gorman or the Staff sample. While

21   the average and median CapEx to net PPE is 10% for the Zepp / Gorman sample, PGE has a

---

[6] Richard A. Brealey, Stewart C. Myers, and Franklin Allen, Principles of Corporate Finance, 10th Edition, 2011, p. 215.
[7] Standard & Poor's RatingsDirect, Portland General Electric Co., May 8, 2014.
UE 283 General Rate Case – Reply Testimony

1   ratio of 16%, which indicates substantial investments in new PPE. Staff's sample is

2   comparable to the Zepp / Gorman sample with an average CapEx to net PPE ratio of 11%.

3   Thus, PGE is investing substantially more in new PPE than the sample companies and a

4   large portion pertains to new generation, which will reduce the company's reliance on power

5   purchases going forward.[8]

6 **Q. Please explain how PPAs increase risk.**

7 A. PPAs are obligations to pay a third party as are bonds and other debt. Therefore, these

8   contracts have debt-like characteristics and are disclosed in the notes to the financial

9   statements along with other third party obligations.[9] Because these obligations have features

10   similar to debt, they increase the leverage of the company even if they are not included in

11   the calculation of debt using balance sheet data.[10] PPAs are treated as a type of debt

12   obligation by credit rating agencies, which may impute debt to utilities that have long-term

13   PPAs. The amount of debt that credit rating agencies impute from PPA obligations depends

14   on (i) the characteristics of the PPA and (ii) the regulatory recovery of the costs associated

15   with the PPA. In the case of PGE, the imputed interest expense from PPAs is non-trivial.

16   Because of the debt-like nature of PPA, they impose financial risk on the buying company

17   (and transfers risk away from the seller). The only way many independent power producers

18   can obtain financing for a new power plant is if they have signed long-term PPAs for the

19   output, i.e., if they have transferred some of the risk to the purchasing utility. Financial

20   institutions such as S&P explicitly recognized the financial risk that PPAs carry,[11] and

---

[8] Portland General Electric Company, 2013 Annual Report, indicates an investment of $1.25 billion in generation assets ("2013 Accomplishments") and that a substantial portion of its current investment pertain to generation (pp. 43 and 55).
[9] See, for example, Portland General Electric Company, 2013 Annual Report, p. 59.
[10] Currently, Generally Accepted Accounting Principles do not require all PPAs to be included on the balance sheet.
[11] See also, Michael J. Vilbert, Bente Villadsen, and Joe Wharton, Understanding Debt Imputation Issues, published

UE 283 General Rate Case – Reply Testimony

1   implicitly, so does the Gorman Testimony, which shows that if S&P's method for imputing

2   PPA debt to PGE is used, then the debt ratio increases from 50% to 53.4%.[12]   Thus, the

3   financial leverage and hence the financial risk increases, which causes the cost of equity to

4   increase. If PGE were to maintain the same overall rate of return when the debt percentage

5   is 53.4% as under the rate making capital structure that has 50% debt, the ROE will need to

6   increase. Gorman's recommendation of 9.4% for 50% regulatory equity[13] translates into an

7   ROE of about 9.7% if the debt percentage increases to 53.4%.[14]

8   **Q. Can you illustrate the magnitude of PGE's PPAs?**

9   A. Yes. First, as shown in PGE Exhibit 2002, PGE has generation to service a little under half

10   of its electric sales and therefore needs to purchase power. In contrast, the companies in the

11   Zepp / Gorman as well as in Staff's sample on average have sufficient generation to service

12   approximately 68% of their load.[15]   Thus, PGE currently has relatively less generation than

13   the sample companies. The magnitude of PGE's reliance on PPAs is also evident from

14   PGE's annual report, which shows that PPAs account for a large portion of its long-term

15   obligations and especially so over the next few years.[16]   Specifically, the PPAs account for

16   22% to 39% of total long-term obligations over the next three years.[17]

17   **Q. Are there other PGE-specific risk factors?**

18   A   Yes, the companies in Staff's sample are larger than PGE. For example, the market

---

by Edison Electric Institute, June 2008
[12] Gorman Testimony, ICNU/218 Gorman/1.
[13] Gorman Testimony, ICNU/202 Gorman/1.
[14] Gorman Testimony, ICNU/202 Gorman/1 calculates the weighted average cost of capital as:
        50% × 9.4% + 50% × 5.50% = 7.45%
   The same weighted cost of capital is obtained at 53.4% debt using an ROE of 9.68%, *e.g.*,
        (1-53.4%) × 9.68% + 53.4% × 5.50% = 7.45%.
[15] The median is a little higher, so there is no obvious single company that drives the results.
[16] Portland General Electric Company, Annual Report, 2013, p. 59.
[17] *Ibid*, table p. 59.
UE 283 General Rate Case – Reply Testimony

1   capitalization for half of Staff's sample companies is above $5 billion and categorized as

2   large cap companies. In contrast, Value Line finds that PGE has a market capitalization of

3   only $2.5 billion and towards the low end of the mid-cap companies.[18]

4   **Q. Why does the size of PGE matter?**

5   A.   Empirically, investors have required a higher premium to invest in smaller companies than

6   in larger ones. For example, Morningstar / Ibbotson data indicate that mid-cap companies

7   ($2 - $5 billion in market capitalization) on average have a return on equity that is 1.14%

8   higher than that of large companies.[19] Therefore, empirical evidence suggests that investors

9   in smaller and mid-cap companies require a higher return than do investors in larger

10   companies. To put the magnitude in perspective, Dr. Zepp suggested an upward adjustment

11   of 0.20% for PGE, while empirical data suggest that the size effect is more than five times

12   larger. As a result, the selection of relatively larger companies plausibly biases the cost of

13   equity estimate downwards.

14   **Q. What conclusions do you draw from the discussion above?**

15   A.   There are several reasons why PGE has a higher level of risk than the comparable

16   companies. It is important to recognize the relative risk of the targeted entity (PGE) versus

17   that of the sample companies used to determine the ROE. Because PGE is more risky along

18   several dimensions, I find that PGE should be placed in the upper end of the reasonable

19   range and therefore an ROE of about 10.5% as recommended by Dr. Zepp is warranted.

20   Consequently, I recommend that the Commission grants PGE its requested ROE of 10%.

21

---

[18] Value Line Investment Survey, May 2, 2014 and June 20, 2014 list Allete, Cleco, IDACORP, and Westar as mid cap companies, while AEP, DTE, Edison International and PG&E are listed as large cap.
[19] Morningstar / Ibbotson, 2014 Classic Yearbook, p. 109.
UE 283 General Rate Case – Reply Testimony

IV.   Staff Fails to Consider Any Model Other than DCF

1 **Q. How do Staff's models differ from those of Zepp in this case?**

2 A. As noted above, the Zepp Testimony relies on constant growth, two-stage and three-stage

3   DCF models along with three versions of the risk premium model. Of these, the DCF

4   models use primarily forward looking information, while the risk premium models use

5   primarily historical information.   The models therefore capture different types of

6   information. In contrast, Staff relies exclusively on versions of the three-stage DCF models.

7   Thus, Staff's results are derived from versions of the same model type and therefore use the

8   same type of information. Staff's models (1) rely heavily on the company-specific growth

9   rates, (2) use only Value Line growth rates, and (3) restrict the sample to eight companies,

10   so the Value Line growth rates for these eight companies along with long-term GDP growth

11   rate assumptions are what determine the cost of equity estimate. Because company-specific

12   growth rates become crucial in Staff's model, sample selection and the exact determination

13   of the growth rates become very important. For example, if the sample selection results in

14   high-growth companies being excluded or low-growth companies being included, then the

15   results are affected.   I therefore take a closer look at the sample composition in Staff's

16   Testimony.

17 **Q. Can you provide an example of why sample composition is important in this case?**

18 A. Yes, looking at Staff's implementation of their model using the Zepp / Gorman sample

19   instead of Staff's sample result in an ROE that is higher by 10 to 60 basis points, i.e., while

20   Staff's sample shows ROE estimates of 8.6% to 9.3%, the same model results in estimates

1   of 9.2% to 9.4% if the Zepp / Gorman sample is used.[20] I discuss the technical issues further

2   below.

3   **Q.   Do you have any additional concerns?**

4   A.   Yes. Because Staff relies exclusively on versions of the DCF model, which is primarily a

5   forward looking model, there is no need to exclude companies that may have had dividend

6   reductions or other issues some years back. The information is simply not used, i.e., only

7   companies that have yet to recover from specific issues merit exclusion. Similarly, Staff's

8   sample selection criteria eliminates companies that have a rating higher than BBB+, which

9   leaves out A- entities such as Consolidated Edison, Vectren, Wisconsin Energy, and Xcel.

10   The elimination of investment grade entities that merely have a higher rating than PGE may

11   result in the elimination of successful entities. This feature could potentially bias the results

12   as lower rated entities tend to have lower growth and also may have unique circumstances

13   that could bias the cost of equity estimation. I therefore consider the impact on Staff's

14   results from allowing all investment grade companies to be part of the sample provided they

15   fulfill all other criteria defined by Staff. I consider the impact of Staff's sample selection in

16   Section VI below.

---

[20] These results are reported in PGE Exhibit 2004, Muldoon 3-4, 9-11. I note that that the figures provided in Staff's Excel workpaper differ slightly.

UE 283 General Rate Case – Reply Testimony

V. The Allowed ROE for Electric Utilities Is Currently Around 10%.

1 **Q. How does Staff use allowed ROEs?**

2 A. Staff notes that the average allowed ROE for 2013 was 10.03% and then excludes Virginia

3 generation cases to obtain an average of 9.75% without the Virginia generation cases. Staff

4 then states the upper end of its 8.8% to 9.6% range overlaps the national average for Q1,

5 2014 if the Virginia generation cases are excluded.[21]

6 **Q. Do you agree with Staff's analysis?**

7 A. No. The analysis is flawed for two reasons. First, looking at only Q1, 2014 data without

8 Virginia is a very short period and with only five non-Virginia cases, no statistical inference

9 can be drawn from the data.[22] Second and more importantly, if Staff wants to place

10 restrictions on companies whose data are included in the analysis, the restrictions need to be

11 applied equitably. Specifically, if data for entities that obtain generation incentives are not

12 relevant, then neither are data for entities that are pure transmission and distribution

13 companies. In other words, only companies that own generation should be included to be

14 comparable to PGE.

15 Looking at the underlying data from SNL,[23] I determine the average allowed ROE for

16 all electric utilities for the period January 1, 2013 to March 31, 2014. I also determine the

17 allowed ROE for companies that own generation but are not subject to Virginia's generation

18 incentives. It is simply not appropriate to exclude the Virginia incentive ROE cases but

19 leave other non-comparable cases in the average. The results are shown in Table 2 below.

---

[21] Staff Testimony p. 19-20.
[22] Regulatory Research Associates, Regulatory Focus: Major Rate Case Decisions – January – March 2014, April 9, 2014.
[23] SNL Financial is a subscription service that collects standardizes and provides access to corporate, financial, market, regulatory and other data. It publishes Regulatory Research Associates data on rate case decisions.

UE 283 General Rate Case – Reply Testimony

1   PGE Exhibit 2003 shows the allowed ROE for various subsets of companies over an

2   extended period of time.

Table 2: Electric Utility Allowed ROE: 2013-2014

	2013-2014
All States	
Average	10.00%
Median	9.95%
Excl. VA	
Average	9.79%
Median	9.80%
Excl. T&D Only Companies	
Average	10.16%
Median	10.00%
Excl. VA and T&D Only Companies	
Average	9.95%
Median	9.95%

3

4   It is clear from Table 2 above that if the allowed ROEs being considered are restricted

5   to entities that are comparable to PGE in the sense that they own generation and do not

6   receive generation incentives, the average ROE is right around 10%. As shown by Dr.

7   Zepp, the allowed ROE for companies in the Zepp / Gorman sample has averaged 10.4% to

8   10.7% in recent years.[24]   Thus, all evidence is that the allowed ROE for comparable

9   companies is at least 10% and therefore the upper end of Staff's range is well below the

10   national average when calculated properly.

11

---

[24] Zepp Testimony, PGE Exhibit 1204.
UE 283 General Rate Case – Reply Testimony

VI.   Technical Details of the Models.

1   **Q. What do you cover in this section?**

2   A. I discuss a few important technical details in the Staff and Gorman testimonies that

3   substantially affect the estimated cost of equity. I address Staff's Testimony in Section A

4   and Gorman's testimony in Section B. The discussion focuses on key elements and is not

5   intended to be exhaustive.

6

A.   Comments on Staff's Testimony.

7   **Q. What is your overall view of Staff's Testimony?**

8   A. As is demonstrated in Staff's Table 1,[25] the combination of using only one model, a small

9   sample and specific assumptions, causes Staff's ROE estimates to be too low. Further,

10   Staff's focus on a select subset of allowed ROE is used to justify the low ROE, but once the

11   national ROE is measured appropriately, as discussed above, it is clear that Staff's

12   recommendation is substantially below the national average.

13 **Q. What technical details in Staff's Testimony do you address?**

14 A. First, Staff appears to base its earnings per share (EPS) growth rate on the difference

15   between the forecasted EPS for the 2011-13 and 2016-18 periods.[26] However, the actual

16   2012 EPS is available and as of today, analysts have access to that data for the purpose of

17   estimating the 2017-19 EPS. Therefore, it is preferable to use actual 2012 EPS as the basis

18   for estimating the growth to 2017-19, which is what I do. Second, Staff excludes a number

19   of investment grade companies because they have an A-rating, which results in the

---

[25] Staff Testimony p. 2.
[26] This is also how Staff calculates the growth in dividends.

UE 283 General Rate Case – Reply Testimony

1 exclusion of companies that are comparable but simply have a credit rating slightly above

2 PGE. As these companies also have a higher growth rate on average than Staff's sample

3 companies, the results are downward biased. Third, Staff relies on a long-term growth

4 (stage 3) rate of 5.02% to 5.78%. The lower end of the range is determined from four

5 specific sources with one being measured incorrectly. I address these points below.

6 **Q. Please explain why the lower end of Staff's forecasted long-term growth may be too**

7 **low.**

8 A. Staff obtains a range of potential long-term GDP growths, where the lower bound is

9 determined using forecasts from Energy Information Administration (EIA), Office of

10 Management and Budget (OMB), Congressional Budget Office (CBO) and an estimate of

11 the historical GDP growth. There are two sources of downward bias in this approach. First,

12 Staff uses growth rate forecasts from EIA, OMB, and CBO, but does not use, for example,

13 Morningstar / Ibbotson's forecast of 5.48%.[27] Second and more importantly, Staff relies on

14 a regression analysis to determine the historical growth in GDP. This is problematic

15 because it underestimates the historical growth relative to what is measured using a simple

16 arithmetic average, which is appropriate when used to determine forward-looking returns.

17 **Q. Why is the arithmetic average the appropriate measure of the historical growth in**

18 **GDP?**

19 A. It is the *expected growth* in GDP rather than the *past performance* that is relevant for the

20 purpose of determining the long-term performance of the sample companies. To see that the

21 arithmetic average is an unbiased estimate of the future growth, consider the following

22 simple example. Assume that the future is similar to the past and the growth rate in each

---

[27] Morningstar / Ibbotson, *2013 Valuation Yearbook*, p. 52.

UE 283 General Rate Case – Reply Testimony

1   period is the result of a random draw from a distribution of possible growth rates.[28] What is

2   our best estimate of the average growth rate given our observations? The average of the

3   observed growth rates! This result is explained in detail in many textbooks including the

4   finance text of Berg and Demarzo 2014 and the Morningstar / Ibbotson 2014 Yearbook.[29]

5   Therefore, the appropriate measure of the historical growth rate is a simple average of the

6   historically observed growth rates, which over the period considered by Staff is 5.63%.[30]

7   Thus, I modify Staffs long-term growth rates as shown in the Staff Testimony p. 13, Table 5

8   as shown in Table 3, below.

9   **Table 3: Staff's Long-Term Growth Rates As Reported and As Revised**
10

| | As Reported | | | As Revised | | |
	Nominal Rate	Weight	Weighted Rate	Nominal Rate	Weight	Weighted Rate
EIA	4.89%	16.70%	0.82%	4.89%	12.50%	0.61%
OMB	4.61%	16.70%	0.77%	4.61%	12.50%	0.58%
CBO	4.55%	16.70%	0.76%	4.55%	12.50%	0.57%
Ibbotson			0.00%	5.48%	12.50%	0.69%
Historical	5.35%	50%	2.68%	5.63%	50%	2.82%
Composite			*5.02%*			*5.26%*
Historical			*5.35%*			*5.63%*
Top 10 Blue Chip			*5.78%*			*5.78%*

11

12   As can be seen from Table 3, the lower end of the long-term growth rates is about 25

13   basis points higher than assumed by Staff.

---

[28] This assumption is also made as the growth rate is estimated using a regression analysis.
[29] Jonathan Berg and Peter Demarzo, "*Corporate Finance: The Core,*" 3rd Edition, 2014, p. 326 and Morningstar / Ibbotson*, 2013 Valuation Yearbook*, pp. 56-57.
[30] A simple average of the GDP growth rates as calculated from Bureau of Economic Analysis GDP data over the period 1980 to 2013 (matching Staff's estimation period).
UE 283 General Rate Case – Reply Testimony

1   **Q. What are the implications of modifying the lower growth rate?**

2   A. If the lower bound on the growth rate becomes 5.26% (instead of Staff's 5.02%) and the

3   historical growth rate is 5.63%, then Staff's lowest estimates increase by about 10 basis

4   points.[31]

5   **Q. Have you determined the impact of the other technical issues?**

6   A. Yes. As noted above, Staff uses the forecasted EPS for 2011-13 to estimate the growth rate

7   for 2016-18.[32]   Given that 2012 actual EPS figures are available, the actual EPS figures

8   should be used. I therefore recalculated Staff's growth rates using actual EPS figures for

9   2012 from Value Line. This had minimal impact on the results.

10 **Q. Did you address the sample selection issue?**

11 A. Yes. I revised Staff's sample to include entities that met Staff's criteria other than not

12   having a credit rating above BBB+ and also included PGE. This resulted in the inclusion of

13   six additional companies: Consolidated Edison, El Paso Electric, Vectren Corp., Portland

14   General Electric, Wisconsin Energy Group, and Xcel Energy.[33]   With the exception of

15   Consolidated Edison, these companies are on average comparable to the rest of the sample

16   regarding generation ownership to load and capital expenditure to net PPE.   Because

17   Consolidated Edison owns very little generation, I report any results both with and without

18   Consolidated Edison.

19   Table 4 below summarizes the modifications that are needed to the ROE estimates in

20   Staff's Testimony to adjust for the downward bias in the estimated long-term growth rates,

---

[31] Estimated by inserting 5.26% instead of 5.02% in Staff Workpapers, Model X.
[32] Value Line Investment Survey reports EPS estimates for, for example, the period 2016-18. However, when I inquired about the year to which the estimate pertains, the response was that it pertains to the middle year. In the example, it is 2017.
[33] I also looked at whether any companies were cut due to older dividend reductions, but found none.

UE 283 General Rate Case – Reply Testimony

1   sample selection issues, the use of estimates rather than actual 2012 numbers, and ensuring

2   that the allowed ROE is measured appropriately.

Table 4: Summary of Staff Original and Modified ROE Estimates:

	As Reported	As Modified	As modified w/o Consolidated Edison
Multi-stage DCF, X (using historical growth)	8.69%	9.21%	9.20%
Multi-stage DCF, Y (using historical growth)	8.81%	9.42%	9.48%
Allowed ROE	9.75%	10.00%	10.00%
Min	8.69%	9.21%	9.20%
Max	9.75%	10.00%	10.00%
Median	9.22%	9.61%	9.60%
Midpoint	9.22%	9.61%	9.60%

Sources: Staff Workpapers, Exhibits 2003 and 2004

3   Looking to Staff's data and recommendation, it appears that the recommendation of

4   9.2% is consistent with the midpoint of the estimated ROE and Staff's calculation of the

5   allowed ROE without the Virginia generation ROEs. Having modified Staff's calculations

6   and re-calculated the allowed ROE by ignoring not only generation-specific ROEs in

7   Virginia, but also the allowed ROE for transmission and distribution-only utilities, I obtain a

8   modified midpoint of 9.6%. If PGE's unique risks are considered, the estimate increases

9   and is comparable to the low end of Dr. Zepp's range of 9.9%. While I think the low end of

10   Dr. Zepp's range is too low for PGE, the analysis shows that once the technical issues in the

11   Staff Testimony have been eliminated and PGE-specific risks are considered, then the

12   estimates overlap Dr. Zepp's recommendation.

UE 283 General Rate Case – Reply Testimony

B.   Comments on Gorman's Testimony.

1   **Q. What technical details in the Gorman Testimony do you address?**

2   A.   First, I address Gorman's argument that the GDP growth is a conservative estimate for the

3   long-term GDP growth. I also discuss Gorman's use of the sustainable growth model.

4   Second, I address Gorman's reliance on a historical market risk premium of 6.1% rather

5   than the Morningstar / Ibbotson historical market risk premium in his CAPM. The

6   Morningstar / Ibbotson figure would result in a market risk premium of approximately 7%[34].

7   The lower market risk premium biases the estimated ROE downward. Third, I address

8   Gorman's risk premium analyses, which rely on misguided allowed ROE figures and where

9   the period over which the analysis is conducted may bias the results downward.

10   **Q. Please explain the issue with Gorman's argument that the "U.S. GDP nominal growth**

11   **rate is a conservative proxy for the highest sustainable long-term growth rate of a**

12   **utility"?[35]**

13   A.   The Gorman Testimony compares the U.S. GDP nominal growth rate and the stock market

14   growth using a geometric series, which measures the compounded growth over a period of

15   time and therefore depends only on the beginning and ending value of the underlying indices

16   (nominal GDP and the stock market index). There are two problems associated with using a

17   geometric measure of growth for the purpose of determining the ROE. As discussed above,

18   the arithmetic average is most appropriate in the context of determining the expected growth

19   rate. The geometric average looks at the compounded growth that has been achieved over a

20   specific time period and is appropriate when reporting the historical performance of, for

21   example, an investor's 401(k) stocks over the last year. However, for the purpose of

---

[34] Morningstar / Ibbotson 2014 Classis Yearbook, p. 91.
[35] Gorman Testimony p. 17.

UE 283 General Rate Case – Reply Testimony

1   determining the cost of equity for PGE over the next period, a forward-looking measure is

2   required. We are interested in the expected growth over the next many years, not the

3   performance over the last decade. It can be shown statistically that geometric return of a

4   series biases the expected return downward.[36] Second, the statistical characteristics of the

5   U.S. nominal GDP and the U.S. stock market are different. Most notably, the stock market

6   tends to be much more volatile than is the nominal GDP. Therefore, the comparison is not

7   meaningful in a statistically sense and one has to be careful interpreting the results.

8   **Q. What is the impact of Mr. Gorman's reliance on the nominal GDP growth in stage 3 of**

9   **his multi-stage DCF model?**

10   A. If the Gorman Testimony instead had relied on, for example, the historical long-term GDP

11   growth of 5.63% as estimated above,[37] the average and median multi-stage DCF estimates

12   increases by about 60-65 basis points as shown in below.

Table 5: Gorman Multi-Stage DCF Results and Modified Multi-Stage DCF Results

Description	Original results (using 4.7% GDP growth rate)		Revised results (using 5.63% GDP growth rate)	
	Average	Median	Average	Median
Multistage Growth DCF Model	8.67%	8.60%	9.35%	9.27%

Sources: Gorman Testimony Table 2, Exhibit 2003

13   **Q. Do you have any other comments on Gorman's DCF results?**

14   A. Yes. Gorman also reports results from a sustainable growth model that estimates the growth

15   rate as the sum of two components. The first component corresponds to internal growth and

16   is based on the percentage of the utility's earnings that is retained in the company to fuel

---

[36] Morningstar / Ibbotson, 2013 Valuation Yearbook, p. 66 shows that the arithmetic average of a series can be approximated as follows:

Arithmetic Average = Geometric Average + Variance of the Series / 2.

Because the variance is a positive number, the arithmetic average is larger than the geometric average.

[37] See Table 3 above.

UE 283 General Rate Case – Reply Testimony

1   future growth while the second component is based on external earnings growth, which

2   originates from issuing shares at above book value. The model runs into problems when

3   companies engage in share buybacks. When a company buys back shares, the external

4   growth in the model is negative, so that the growth rate is reduced. At the same time,

5   investors receive early cash distributions (from the sale of shares), but the model fails to take

6   this cash distribution into account - the model values the stock as if there was no distribution

7   to shareholders from the buyback. Because the estimated ROE increases with the assumed

8   distribution to shareholders, the model's failure to account for share buybacks biases the

9   results downward when buybacks occur. In this case, Wisconsin Energy has undertaken a

10   share buyback[38]. Therefore, the sustainable growth DCF estimates are biased downward. I

11   have not estimated the impact of this effect.

12   **Q. Why do you think Gorman's historical market risk premium is too low?**

13   A.   The Gorman Testimony uses the average of two market risk premium estimates derived

14   from Morningstar / Ibbotson data.   I will address only the second estimate, which is

15   determined as the difference between the historical average return on the stock market

16   (12.1%) and the historical total return on long-term government bonds (5.9%), so that the

17   difference of 6.2% is the estimated market risk premium.[39]   The problem with this

18   derivation is that Gorman relies on the total return of the long-term government bonds,

19   whereas the only truly risk-free portion of the return is the income return. The authors of the

20   text relied upon in the Gorman Testimony makes this clear:

21   Another point to keep in mind when calculating the equity risk premium is that the income
22   return on the appropriate horizon treasury security, rather than the total return, is used in the
23   calculation. The total return is comprised of three return components: the income return, the

---

[38] Wisconsin Energy Corporation, Investor Presentation, August 2013, p. 26.
[39] Gorman Testimony pp. 28-29.
UE 283 General Rate Case – Reply Testimony

1   capital appreciation return and the reinvestment return… *The income return is thus used in the*
2   *estimation of the equity risk premium because it represents the truly riskless portion of the*
3   *return.* (emphasis added)[40]

4   **Q. What is the effect of the downward bias in the relied upon market risk premium?**

5   A. Using the total return on the long-term government bonds, Gorman obtains a CAPM

6   estimate of the ROE of 9.36%.[41]   However, had Gorman instead used the approach

7   recommended by Morningstar / Ibbotson, the resulting CAPM ROE would be 10% as shown

8   in Table 6 below.

Table 4: Gorman's Estimated CAPM ROE and As Modified CAPM ROE

Description	*High Market Risk Premium*	*Low Market Risk Premium (As Reported)*	*Low Market Risk Premium (As Revised)*
Risk-Free Rate	4.40%	4.40%	4.40%
Risk Premium	6.96%	6.20%	7.00%
Beta	0.80	0.80	0.80
CAPM	**9.97%**	**9.36%**	**10.00%**

9   Because Gorman uses the approach of averaging his two CAPM ROE estimates the

10   CAPM estimate for ROE increases from 9.63%[42] to 9.99% once the Low Market Risk

11   Premium has been revised as suggested in the text relied upon by Gorman.

12   **Q. Do you have any comments on the Gorman Testimony's Risk Premium Method?**

13   A. Yes. The Gorman Testimony uses the difference between the allowed ROE for electric

14   utilities and 20-year treasury bond yield or between the allowed ROE and the yield on A-

15   rated utilities to assess the risk premium that electric utilities need over the bond yield.

16   There are two problems with Gorman's implementation of this model. First, Gorman

17   selectively eliminate the allowed ROEs that originate from Virginia's generation incentives,

---

[40] Morningstar Ibbotson 2013 Valuation Yearbook p. 55.
[41] Gorman Testimony, ICNU 217 Gorman/1.
[42] Gorman Testimony, ICNU 217 Gorman/1.

UE 283 General Rate Case – Reply Testimony

1   but does not eliminate other non-comparable awards such as those that pertain to

2   transmission and distribution companies only. Second, there is no specific time period over

3   which the risk premium theoretically should be determined and the relationship between the

4   allowed ROE and the bond yield could change over time. Therefore, I modify the risk

5   premium model in two ways: (1) I replace Gorman's calculated allowed ROE in recent years

6   by the actual allowed ROE and (2) I estimate the risk premium that results from varying the

7   period over which it is estimated. I use Gorman's estimate of 4.40% for the 20-year

8   government bond yield and his estimate of 4.87% for the A-rated utility bond yield in the

9   table below.[43] The key results are presented below in Table 7.

10   **Table 5: Gorman Risk Premium Results as Reported and as Modified**

11

	As Reported		As Modified	
	Using T-Bonds	Using A-rated Utility Bonds	Using T-Bonds	Using A-rated Utility Bonds
1986 - 2014	9.75%	8.84%	9.82%	8.91%
Last 20 years			10.23%	9.28%
Last 15 years			10.50%	9.48%
Last 10 years			10.67%	9.84%

12

13   From Table 7 above, it is clear that Gorman's recommendation of 9.70% for the risk

14   premium model is too low if the intention is to "provide 70% weight to the high-end" and

15   "30% to the low-end."[44] If I assign 70% weight to the highest estimate of 10.67% and 30%

16   to the low estimate of 8.91%, the estimated ROE is 10.1%.[45] Therefore, the risk premium

---

[43] Gorman pp. 24-25 consider a range of estimates.
[44] Gorman p. 25.
[45] Ignoring the last row in the table (Last 10 years) to be conservative, the estimated ROE is
UE 283 General Rate Case – Reply Testimony

1   estimates are low relative to what is currently allowed nation-wide and relative to what the

2   data show.

3   **Q. Can you summarize the needed adjustments to the Gorman Testimony?**

4   A. Yes. Table 8 below summarizes the modifications that are needed to the ROE estimates in

5   the Gorman Testimony.

Table 8: Summary of Gorman as reported and Modified ROE Estimates

	As Reported	Modified Range	
DCF	9.05%	9.37% -	9.42%
Constant Growth DCF	9.47% - 9.49%	9.47% -	9.49%
Sustainable Growth DCF	8.69 - 8.82%	na -	na
Multi-stage DCF	8.59 - 8.67%	9.27% -	9.35%
Risk Premium	9.70%	10.00% -	10.10%
CAPM	9.60%	9.99% -	9.99%
Average of Models	9.45%	9.79% -	9.84%

Source: Gorman Tables 1, 2,3, Exhibit 2003

6   As is evident from Table 8 above, only Gorman's DCF estimates support an ROE as low

7   as 9.4% and if implemented appropriately, Gorman's models and data support a midpoint of

8   about 9.8%. Further, PGE should be placed towards the upper end of the range, so that the

9   data indicates an appropriate ROE is at or above 10%.

10   **Q. What do you conclude from the analysis above?**

10.0% using the 70-30 weighting.
UE 283 General Rate Case – Reply Testimony

1   A.   Based on my review of the submitted testimonies and the available evidence, a range of

2   9.9% to 10.6% is reasonable for PGE with the upper end being more appropriate because of

3   PGE's specific risks. I also find Staff's Testimony and Gorman's Testimony have biased

4   the cost of equity estimates downward by about 40 basis points and fail to consider PGE-

5   specific risks for which approximately 20 basis points should be added. Therefore, Staff's

6   recommended number, when properly revised indicates an ROE of 9.6% - 10.0% and

7   Gorman's recommendation indicates an ROE of 9.8% - 10.1%. Therefore, I recommend

8   that PGE be granted its requested ROE of 10%.

9   Q.   **Does this conclude your testimony?**

10   A.   Yes.

UE 283 General Rate Case – Reply Testimony

List of Exhibits

PGE Exhibit	**Description**
2001	Resume of Dr. Bente Villadsen
2002	Risk Characteristics of Sample Companies
2003	Awarded ROE for Electric Utilities
2004	Revised ROE Estimation Results for Staff and Gorman