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I. Introduction and Summary

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

2 A. My name is Thomas M. Zepp. I am an economist and vice president of Utility Resources,
3 Inc., Suite 250, 1500 Liberty Street, S.E., Salem, Oregon 97302. My qualifications appear
4 at the end of this testimony.

5 **Q. What is the subject of your testimony in this proceeding?**

6 A. Portland General Electric Company (“PGE” or the “Company”) asked me to estimate its
7 required return on equity (“RROE”). I also call the RROE the “cost of equity” in this
8 testimony. My study is based on data available to investors in early December 2009.

9 **Q. What are the results of your analysis?**

10 A. The results of my analysis are provided in the table below:

<u>Basis for Estimate</u>	<u>Estimated Cost of Equity for PGE</u>
First Discounted Cash Flow (“DCF”) Analysis	11.7%
Second DCF Analysis	11.7%
Third DCF Analysis	11.4%
First Risk Premium (“RP”) Analysis	11.1% to 11.5%
Second RP Analysis	10.9% to 12.0%
Third RP Analysis	11.1%
Comparable Earned and Authorized ROEs	11.0% and 11.0%
Estimated Range of Equity Costs	10.9% to 12.0%

11 Each of these estimates of PGE’s RROE includes a 20 basis point risk adjustment to
12 reflect that PGE is more risky than the sample I use to determine the benchmark cost of
13 equity estimates. I recommend that PGE be authorized an ROE of no less than 11.0%.

1 **Q. Will PGE require a higher ROE in 2011 than it required when you prepared testimony**
2 **in late 2007?**

3 A. Yes. Since the time I prepared direct testimony for PGE in UE 197, the seriousness of the
4 financial crisis has been recognized and there has been an unusually severe recession.
5 During the last two years, there has been a “flight to quality” as investors have sold risky
6 assets and bought Treasury securities. As the demand for Treasury securities increased,
7 prices for the Treasury securities increased, Treasury rates declined and the expected spread
8 between Baa Corporate bond rates and 30-year Treasury rates increased. See PGE Exhibit
9 1202. In most periods, costs of common equity tend to move in the same direction as
10 Treasury rates but by less. In the current situation, however, evidence indicates costs of
11 equity have increased even though Treasury rates have declined. Annual average Treasury
12 rates forecasted for the period when PGE’s new rates will be in effect are lower than in the
13 period 1990 to 2008 (see PGE Exhibit 1202). Spreads between Baa bond rates and
14 Treasuries are forecasted to stay higher during the period new PGE rates will be in effect
15 than in the period 1990 to 2008 (compare PGE Exhibit 1202 and PGE Exhibit 1211).

16 Also, even though Treasury rates are now lower than forecasted Treasury rates at the
17 time I prepared testimony in 2007 (compare UE 197/PGE Exhibit 1011 Zepp to PGE
18 Exhibit 1211), DCF equity cost estimates using similar models are higher today than in 2007
19 when I prepared equity cost testimony for PGE (Compare UE 197/ PGE Exhibit 1016 Zepp
20 to PGE Exhibit 1216). In UE 197, DCF estimates of the cost of equity for a benchmark
21 sample of electric utilities fell in a range of 10.5% to 11.3%. Currently, updates of those
22 DCF models indicate the cost of equity for the benchmark sample falls in a range of 10.7%
23 to 11.8%.

1 As a result, even though Treasury rates have declined, three versions of the DCF model
2 indicate the cost of equity for PGE in 2011 has increased. Once complete estimates of the
3 RP and DCF models are made, I find PGE's expected cost of equity in 2011 falls in a range
4 of 10.9% to 12.0%. A comparable range was 10.7% to 11.5% in November 2007.

5 **Q. Please discuss recent developments in financial markets that put your current equity**
6 **cost estimates in perspective.**

7 A. My equity cost estimates are forward-looking, but investors have been beaten up badly in
8 the last two years and are still wary about what that future will bring. While it now appears
9 that the economy is slowly pulling out of recession and may well have been out of recession
10 for a while, there is still talk of a possible "double dip" recession in which the economy falls
11 back into recession before a full recovery from the last one is completed. Alternatively,
12 Value Line and others with a brighter view of the future do not see a "V" shaped recovery.
13 Instead they see gradual GDP growth which will remain in a range of 2.0% to 2.5% for
14 some time. Additionally, there continues to be limited access to credit markets, the housing
15 market is showing only modest recovery and uncertain wage and job prospects continue.
16 While the prices for common stocks have increased in the last few months, common stock
17 prices are still substantially below the levels that prevailed in late 2007 when the
18 significance of the financial crisis began to be recognized. Given this state of the economy
19 and continuing restrictions on credit availability in financial markets, it is not surprising that
20 equity investors are demanding higher expected returns on equity today than in 2007.

21 **Q. How is your testimony organized?**

22 A. In this section, I present the concept of a fair rate of return and a summary of my analysis.

1 In Section II, I compare the risks of the electric utilities sample I rely upon to determine
2 benchmark DCF equity cost estimates to risks faced by PGE. Based on the Commission's
3 determination that PGE required an upward risk adjustment of 10 basis points in Order No.
4 07-015, the Commission's determination of a negative risk premium of 10 basis points due
5 to decoupling approved in Order No. 09-020, and unique PGE risks that Mr. Valach, Mr.
6 Hager and I discuss, I conclude that PGE requires, on net, an ROE that is 20 basis points
7 higher than the cost of equity for my benchmark electric utilities sample.

8 Section III develops my DCF equity cost estimates for a benchmark sample of 31
9 electric utilities based on three alternative DCF approaches.

10 Section IV presents three RP analyses. Initially, I explain why it is reasonable to expect
11 equity cost risk premiums to vary inversely with interest rates and present different types of
12 evidence that support such a conclusion. Subsequently, I present equity cost estimates based
13 on three different risk premium approaches.

14 In Section V, I present a check on the reasonableness of my DCF and RP equity cost
15 estimates based upon recent authorized and earned rates of return on equity ("ROEs") for
16 the sample utilities.

17 Section VI provides a summary of my analysis, an estimated range in which PGE's cost
18 of equity falls, and my recommended ROE for PGE.

19 **Q. Have you prepared any exhibits to accompany your testimony?**

20 A. Yes. I have prepared 16 exhibits that support my testimony, provided as PGE Exhibits 1201
21 through 1216.

1 **Q. Please discuss what is meant by a fair rate of return.**

2 A. A fair rate of return is achieved when a utility is authorized rates and rate adjustment
3 mechanisms at levels where the expected return provides common stock investors a
4 reasonable opportunity to earn the cost of common equity. Because operating expenses and
5 interest on debt take precedence over payments to common stock holders, it is the common
6 equity shareholder of the company who bears the greatest risk of receiving expected returns.
7 In 1923, the U.S. Supreme Court set forth the following standards in the Bluefield
8 Waterworks decision:

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economic management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market, and business conditions generally. 262 U.S. 679, 692-93 (1923).

9 In the Hope Natural Gas Company decision, issued in 1944, the U. S. Supreme Court
10 stated the following regarding the return to owners of a company:

[T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. 320 U.S. 591, 603.

11 In 1989, in Duquesne Light Co. v Barasch the U.S. Supreme Court also recognized two
12 important economic concepts: First, it found that regulatory commissions may need to

1 adjust the risk premium element of the rate of return on equity to provide a fair return. It
2 said:

[W]hether a particular rate is "unjust" or "unreasonable" will depend to some extent on what is a fair rate of return given the risks under a particular rate setting system . . . 488 U.S. 299, 310.

3 Therefore, in determining an appropriate return, consideration must be given to the specific
4 risks created by the nature and degree of regulation to which the utility is subject, in addition
5 to examining general economic and financial data for utilities.

6 In Oregon, the legislature passed ORS 756.040, which puts into state law the principles
7 the U.S. Supreme Court established in the Hope and Bluefield decisions.

8 Additional risk faced by PGE should be recognized when setting the fair rate for return
9 for the Company. Mr. Valach, Mr. Hager and I explain the unique additional risks of PGE
10 and why PGE requires a higher ROE than the electric utilities in the sample I use to
11 determine guideline cost of equity estimates. In Orders No. 07-015 and No. 09-020, the
12 Commission recognized PGE's RROE may need to differ from returns for other utilities due
13 to higher or lower risks. I estimate the net impact of risks identified by the Commission
14 together with other risks discussed by Mr. Valach, Mr. Hager, and I increase PGE's RROE
15 by 20 basis points above the ROEs required by the benchmark samples of utilities I rely
16 upon to conduct my ROE analyses to reflect greater risks borne by PGE.

17 **Q. What is the crucial implication of the principles set out by the U. S. Supreme Court**
18 **and in ORS 756.040 in the determination of a fair rate of return for PGE?**

19 A. The crucial implication is that the rates and rate adjustment mechanisms authorized for PGE
20 by the Oregon PUC should give PGE an opportunity to earn the rate of return investors
21 could expect to earn if they invested in another utility of comparable risk. That rate of

1 return should be sufficient to attract capital on reasonable terms and high enough to assure
2 confidence in the financial integrity of PGE. As I discuss further below, PGE is more risky
3 than the electric utilities samples I rely upon to determine benchmark estimates of the cost of
4 equity and thus its RROE is higher.

5 **Q. Are there other implications?**

6 A. Yes. Other implications differ among bondholders and customers of PGE. From the
7 perspective of bondholders, authorized rates need to be sufficient to assure current and
8 prospective bondholders that PGE will have interest coverage comparable to other utilities
9 having similar risk. Otherwise, the acceptance of PGE's bonds will decline and borrowing
10 costs will increase. An increase in bond costs would ultimately fall on the shoulders of
11 PGE's customers. This is especially important at this time when PGE anticipates it will
12 need to issue bonds and equity to fund large new capital expenditures.

13 From the perspective of customers, the RROE is another cost of service required by
14 PGE so it can provide safe, reliable and adequate service now and in the future. Thus, the
15 rates customers pay should provide a reasonable opportunity for PGE to earn that cost of
16 equity. The fair rate of return on common equity is the cost of common equity and PGE's
17 RROE.

18 **Q. Please summarize your testimony.**

19 A. My findings and recommendations are the following:

20 1. The cost of common equity faced by PGE is greater than the cost of common
21 equity that faces a typical electric utility in the sample I use to determine
22 benchmark equity costs. PGE has above-average risk from its significant
23 exposure to the wholesale market but below-average risk from decoupling which

1 is available to most, but not all, utilities in the benchmark sample. PGE is more
2 risky because it is smaller than the average utility in my benchmark sample, has
3 risks related to its large capital expenditures program and is faced with a unique
4 set of risks described by Mr. Valach and Mr. Hager, including risk from SB 408,
5 debt imputation related to purchased power contracts, litigation involving the
6 closure of the Trojan nuclear plant and risks of complying with the Renewable
7 Portfolio Standard. Combined, the net impact of higher risk and benefits increase
8 PGE's cost of equity by no less than 20 basis points above the cost of equity for a
9 typical electric utility.

10 2. PGE has requested a modification to its PCAM to reduce its risk to a level more
11 in line with the utilities in my benchmark sample. See PGE Exhibit 1203 and my
12 discussion of this issue at page 16 (also see PGE Exhibit 200 and PGE Exhibit
13 1100). If that is not authorized, its required risk premium above the cost of equity
14 for those benchmark utilities is substantially higher than 20 basis points.

15 3. The benchmark cost of common equity for the electric utilities samples I use to
16 determine guideline equity costs falls in a range of 10.7% to 11.8% at this time:

- 17 • Three DCF estimates for the electric utilities sample indicate the cost of
18 equity falls in a range of 11.2% to 11.5%;
- 19 • Costs of equity derived from three risk premium analyses indicate the cost
20 of equity for the benchmark electric utility sample falls in the range of
21 10.7% to 11.8%;
- 22 • Averages of earned ROEs of 10.8% and authorized ROEs of 10.8%
23 corroborate the reasonableness of these RP and DCF equity cost estimates.

1 4. I conclude that PGE's RROE falls in a range of 10.9% to 12.0% and recommend
2 the Company be authorized an ROE of no less than 11.0%. See PGE Exhibit
3 1216.

II. Risks of PGE and the Electric Utilities Sample

1 **Q. As a preliminary matter, please discuss the sample of electric utilities you used in your**
2 **DCF analyses.**

3 A. My DCF sample is composed of the 31 electric utilities listed in PGE Exhibit 1201 of my
4 testimony. These electric utilities are those listed by AUS Utility Reports in categories AUS
5 calls “Electric Companies” and “Combination Electric & Gas Companies” that had an
6 investment grade bond rating from either S&P or Moody’s, were vertically integrated
7 companies, had more than 50% of their revenues derived from regulated electric revenues,
8 paid a dividend, and had consensus estimates of analysts’ forecasts of growth reported by
9 several sources. PGE Exhibit 1201 lists percentages of revenues from electric operations,
10 Value Line estimates of betas, expected common equity ratios, Standard & Poor’s business
11 risk profiles and financial risk profiles, bond ratings, states in which the utilities operate,
12 whether the utilities have decoupling or other fixed cost recovery mechanisms, size of the
13 utilities, and percentages of purchased power. It also displays averages of that information
14 for the sample and comparable data for PGE.

15 **Q. Please provide an overview of your discussion of risk.**

16 A. Investors can choose to invest in many different types of assets with varying degrees of risk.
17 Those investments might be in real estate, gold, collections of fine art, or financial assets.
18 The financial assets run the gamut from relatively low risk assets, such as Treasury
19 securities and somewhat higher risk investment grade corporate bonds, to relatively high risk
20 shares of common stocks. As the level of risk increases, investors require higher expected
21 returns. Common stocks of utilities are generally more risky and thus require higher returns
22 than investment grade bonds, which are secured debt instruments with fixed repayment

1 terms. Operating expenses, interest on debt and repayment of principal take precedence
2 over payments to common stock holders, and thus it is the common equity shareholder of
3 the utility who bears the greatest risk of not receiving expected returns. Conceptually,

$$4 \quad \text{Required return for} \quad = \quad \text{Expected Return} \quad + \quad \text{risk} \\ 5 \quad \text{common stock} \quad \quad \quad \text{on a BBB bond} \quad \quad \quad \text{premium}$$

6 BBB bonds are the lowest category of investment grade bonds. The required return for
7 common stock is the cost of equity. Long-standing regulatory principles recognize
8 customers should expect to pay all costs of service. One of those costs is the cost of equity.

9 Because equity owners are the last in line to be paid, equity owners will not earn
10 enough to cover the cost of equity every year. But though equity owners know they will not
11 earn the RROE every year, rates and rate-adjustment mechanisms should be established so
12 investors have a reasonable opportunity to earn it. Over a period of several years, the rates
13 and rate adjustment mechanisms should be designed to produce ROEs that are on average
14 equal to the RROE. Rates and rate-adjustment mechanisms which produce expected
15 revenues which are lower than required will subsidize customers at the expense of equity
16 owners and are in conflict with standards of the U.S. Supreme Court and ORS 756.040
17 discussed above.

18 **Q. Is PGE more risky than the sample of electric utilities you rely upon to determine your**
19 **benchmark ROE estimates?**

20 A. Yes. Compared to the sample of electric utilities in PGE Exhibit 1201, PGE is more risky
21 because it (a) has significant exposure to the wholesale market due to its reliance on wind
22 and hydro generation, (b) is smaller than the average utility in my benchmark sample, (c)
23 has greater risk than in the past due to its larger capital expenditures program, (d) has debt
24 imputation related to purchased power contracts, (e) currently has a PCAM that does not

1 reduce risk as much as the typical PCAM authorized for other electric utilities in my sample,
2 and (f) has other unique risks described by Mr. Valach and Mr. Hager. These risks are
3 offset to some extent by PGE having decoupling.

4 **Q. Does PGE's reliance on hydro power and wind generation increase risk?**

5 A. Yes. Both of these sources of power are subject to unknown and uncontrollable weather
6 conditions and thus power generated from these resources will unavoidably vary from year
7 to year. PGE faces risk related to the cost of replacing that power with power from
8 wholesale markets at costs that are unpredictable. Additionally, the costs of replacing this
9 power are generally expected to be much higher than any cost savings that are expected to
10 occur if the resources produce more power than average. In its August 26, 2009 Ratings
11 Direct Report for PGE, S&P's specifically stated it considered PGE's vulnerability to hydro
12 variability when it assessed PGE's business risk profile. S&P gives PGE a higher risk
13 business risk profile than the average utility I use to determine benchmark costs of equity.
14 See PGE Exhibit 1201. Moody's also stated the variability in hydro was also taken into
15 account when it assessed PGE's risk profile. See Moody's September 24, 2009 Credit
16 Opinion for PGE. PGE's current PCAM mitigates but does not eliminate these unavoidable
17 risks.

18 **Q. Has the Oregon Commission specifically increased PGE's authorized ROE to**
19 **recognize the added risk of exposure to wholesale markets?**

20 A. Yes. In Order No. 07-015, the Oregon Commission noted PGE had significant exposure to
21 the wholesale market, particularly as compared to PacifiCorp, and increased PGE's
22 authorized ROE by 10 basis points over PacifiCorp's to compensate for that risk exposure.

1 **Q. Does PGE’s higher percentage of purchased power increase its risk?**

2 A. Yes. See PGE Exhibit 1201. Mr. Valach and Mr. Hager address this issue. Some ratings
3 agencies impute debt to PGE to reflect its purchased power contracts. This has the result of
4 increasing PGE’s leverage for ratings purposes and thus has a negative impact on PGE’s
5 credit rating.

6 **Q. Is PGE smaller than the average electric utility in PGE Exhibit 1201?**

7 A. Yes. Based on market values in November 2009, PGE is about 1/5th as large as the average
8 electric utility in PGE Exhibit 1201.

9 **Q. Does PGE’s small size increase its risk relative to the sample in PGE Exhibit 1201?**

10 A. Yes. Academic studies have addressed the issue of company size and risk and found that, in
11 general, smaller firms are more risky. The seminal version of CAPM, developed in the
12 mid-1960s, relied upon only beta as the measure of risk. Eugene Fama and Kenneth French
13 (“The Capital Asset Pricing Model: Theory and Evidence,” *Journal of Economic*
14 *Perspectives*, Volume 18, No. 3, Summer 2004 pp. 25-46) provide evidence that questions
15 the usefulness of the simple CAPM and explain that other variables such as company size
16 and various price ratios add to the explanation of stock returns. This problem of choosing
17 the “correct version” of CAPM is, of course, one of the problems with using CAPM to
18 determine equity costs for utilities. But notwithstanding which CAPM version is the correct
19 one, Fama and French did find that company size as well as other factors help explain how
20 investors price common stocks.

21 Ibbotson Associates (now Morningstar)¹ has examined this issue for a number of years
22 and found that smaller firms require higher and higher returns as size becomes smaller and

¹ Ibbotson Associates was recently purchased by Morningstar.

1 smaller. (Morningstar, *2009 SBBI Yearbook Valuation Edition*, Chapter 7). I also published
2 an article, "Utility Stocks and the Size Effect - Revisited," *The Quarterly Review of*
3 *Economics and Finance*, Vol. 43, Issue 3, Autumn 2003, pp. 578-582, which showed
4 smaller utilities are more risky than larger utilities. Combined, this information shows there
5 is no "bright line" that separates smaller, higher risk utilities from larger, lower risk utilities,
6 but that risk and required ROEs increase as utilities are smaller.

7 **Q. Have you determined a specific risk adjustment to compensate PGE for being smaller**
8 **than the sample you rely upon in PGE Exhibit 1201 to conduct your DCF analyses?**

9 A. No. Morningstar divides companies into ten deciles and then groups those deciles into
10 Large-Cap, Mid-Cap, Low-Cap and Micro-Cap categories. It reports size risk premiums for
11 each of these categories. PGE's size places it in the Low-Cap category. Nine of the utilities
12 in PGE Exhibit 1201 are Large-Cap companies, twelve are Mid-Cap companies and the
13 remaining ten companies are Low-Cap companies. Based on the risk premium estimates
14 reported by Morningstar in 2009, a typical company in the Low-Cap category requires a risk
15 premium that is 154 basis points higher than a company in the Large-Cap category and 66
16 basis points higher than a company in the Mid-Cap category. See PGE Exhibit 1204. To
17 the extent this study of companies in general applies to utilities, PGE requires an ROE that is
18 higher than 21 of the 31 companies in the electric utilities sample in PGE Exhibit 1201.
19 While I do not determine a specific risk premium addition for size, I do take this evidence
20 into account when determining the risk premium above the equity cost estimates made for
21 the benchmark sample.

1 **Q. In general, do electric utilities face more risk when they have to make additional**
2 **investments?**

3 A. Yes. Additional capital spending requires utilities to request rate increases to recover
4 returns on and of new rate base additions. Regulatory procedures raise doubts in investors'
5 minds that it is politically possible to request the required increases or that regulators will
6 authorize high enough rates and/or rate adjustment mechanisms to enable the utilities to earn
7 fair rates of return. From an investor's point of view, it is the potential for such
8 disallowances, delays or exclusion from consideration in setting new rates that increases
9 risk. With the need for additional investments, uncertainty arises and the risk increases.

10 **Q. Does PGE plan to invest significantly more than in the past?**

11 A. Yes. PGE has filed an Integrated Resource Plan with the Commission that sets forth its
12 large capital investment program for the next five years. In their most recent credit
13 evaluations of PGE, both Moody's (September 24, 2009) and Standard & Poor's (August
14 26, 2009) highlight this need for larger capital expenditures in their discussions of PGE's
15 credit quality. Regulatory support to recover costs of these significant new, large capital
16 expenditures is crucial to PGE maintaining access to credit markets at reasonable costs. Mr.
17 Valach and Mr. Hager also address this issue in their testimony.

18 **Q. Does PGE's current PCAM make it more risky than the sample of electric utilities in**
19 **PGE Exhibit 1201?**

20 A. Yes. PGE provided me with information for a sample of seventeen utilities it had previously
21 considered when it reviewed the types of PCAMs generally available to utilities. This set of
22 utilities is listed in PGE Exhibit 1203. PGE's PCAM analysis is provided as a work paper
23 accompanying PGE Exhibit 200. I considered these seventeen utilities to conduct a peer

1 group analysis of PCAMs. DCF equity cost estimates—which I determine later in my
2 testimony—indicate the sample of seventeen utilities in PGE Exhibit 1203 has
3 approximately the same risk and RROE as the larger sample of 31 utilities in PGE Exhibit
4 1201. This result indicates that risk reducing benefits of a typical PCAM are already in the
5 cost of equity estimates for the benchmark sample in PGE Exhibit 1201.

6 While the PCAM authorized for PGE is certainly a step in the right direction and is
7 preferable to no PCAM, it does not reduce risk as much as the typical PCAM authorized for
8 utilities in the peer group sample. Most of the utilities in the peer group sample have
9 PCAMs that offset more uncertainty in power costs and provide better opportunities to
10 recover unavoidable costs than the one currently authorized for PGE. Based on my review
11 of PCAMs and RROEs, I found that unless the current PGE PCAM is revised to be more in
12 line with PCAMs available to other utilities, PGE is more risky than the typical utility in my
13 benchmark sample in PGE Exhibit 1201.

14 **Q. Have you taken the relative risk of PGE’s current PCAM into account when you**
15 **determined your risk premium estimate?**

16 A. No, I did not. PGE has proposed modification of its PCAM to make risks of recovery of
17 power costs more in line with the risks of the peer group and thus I have not increased my
18 recommended risk premium to incorporate the relatively higher risk of PGE’s current
19 PCAM.

20 **Q. Do you have any comments about the impact of decoupling on the need for a risk**
21 **premium?**

22 A. Yes. In Order No. 09-020, this Commission found that adoption of decoupling justified an
23 ROE reduction of 10 basis points for PGE. It is clear that ratings agencies and utilities

1 prefer rate designs with decoupling to traditional rate designs when utilities have risks of
2 losing load due to conservation efforts. I have three observations. First, in its
3 September 24, 2009 Credit Opinion, Moody's says it views decoupling mechanisms as
4 credit positive for utilities but noted that similar mechanisms exist for a growing number of
5 utilities around the country. Before determining if a negative risk premium (an ROE lower
6 than the benchmark cost of equity for a sample of electric utilities) is required due to
7 decoupling, it should be determined if the risk-reducing benefits of decoupling are already in
8 the benchmark costs of equity estimates. PGE Exhibit 1201 shows 17 of the utilities in the
9 sample already have decoupling mechanisms or alternative fixed cost recovery mechanisms
10 available in at least one state in which they do business and three more have approval of
11 decoupling mechanisms pending. Given the push for conservation and other efficiency
12 measures, it is reasonable for investors to expect more regulators to approve such rate
13 designs in the future. The data in PGE Exhibit 1201 and reasonable expectations about the
14 future indicate cost of equity estimates for most utilities in the sample already reflect the
15 benefit of such rate designs (whatever that benefit is). Second, if there is a benefit for
16 investors from decoupling, I expect the impact on RROE is small. Third, decoupling may
17 be required simply to offset higher risks that occur when conservation initiatives are pressed
18 by government agencies and utilities. However, until all electric utilities in the sample used
19 to determine benchmark equity costs have decoupling or alternative fixed cost recovery
20 mechanisms, I conclude a benefit of 10 basis points is not unreasonable and I take it into
21 account when I determine my risk premium estimate for PGE.

1 **Q. What is your recommended risk adjustment for PGE?**

2 A. In Order No. 07-015, the Commission determined that PGE requires a risk premium of 10
3 basis points to compensate for its significant exposure to the wholesale market. That risk
4 continues and increases due to uncertainty of production from wind projects as well as hydro
5 projects. PGE is more risky than in the past when it had a much more modest capital
6 expenditures program, is more risky because it is only 1/5th as large as the benchmark
7 sample and has a higher than average percentage of purchased power. PGE is also more
8 risky than the sample due to other unique risks Mr. Valach and Mr. Hager discuss in their
9 testimony. It is, however, somewhat less risky than some of the utilities in the benchmark
10 sample due to its decoupling rate design. Taking into account PGE's exposure to all of these
11 various positive and negative risks, I recommend the Commission adopt a risk premium of
12 20 basis points when it determines PGE's authorized ROE.

13 **Q. Is your recommended risk premium consistent with the indicators of risk in PGE**
14 **Exhibit 1201?**

15 A. Yes. Risk indicators in PGE Exhibit 1201 corroborate my recommended risk premium of 20
16 basis points for PGE. They show PGE has the same or higher risk than the sample average
17 utility. PGE is more risky with respect to beta estimates, S&P business risk profiles, size,
18 and percentage of purchased power. Recognizing rating agencies impute debt to PGE for its
19 above-average percentage of purchased power, PGE is also more risky with respect to its
20 equity ratio. S&P reduced PGE's corporate credit rating to BBB and reduced its senior
21 secured rating to A- from A in January 2010. S&P Correct: Portland General Electric Co.
22 Corporate Credit Rating Lowered to 'BBB' on Weak Economy (January 29, 2010). After

- 1 the downgrading, PGE has approximately the same risk as the sample based on S&P
- 2 financial risk profiles and bond ratings of both Moody's and S&P.

III. DCF Equity Cost Estimates

1 **Q. Do you have preliminary comments related to the use of the DCF model to determine**
2 **equity cost estimates?**

3 A. Yes. Given the weight the Commission has given to the DCF model in recent Oregon
4 decisions, I begin my RROE study with my DCF estimates. However, I strongly
5 recommend the Commission consider several versions of the DCF model and other useful
6 information to determine a fair ROE for PGE. The DCF model depends crucially on
7 assumptions about constant or multi-period growth rates in the future. We do not, however,
8 know exactly how investors form their opinions about these growth rates. Not only are there
9 unavoidable difficulties with estimating growth rates but also investors may consider
10 information and financial models other than the DCF model to price stocks. Other methods
11 assume investors make decisions in different ways and thus it is appropriate to make
12 different abstractions to model investor behavior. There is no guarantee that any particular
13 method is the “right” one and thus superior to others. It follows then that other reasonable
14 approaches should be considered.

15 At a minimum, other financial models and the data regarding authorized and earned
16 ROEs in PGE Exhibit 1215 should be used as a check on the specific DCF assumptions and
17 methods being employed. Several methods and large samples of comparable risk companies
18 should be relied upon to make those estimates whenever possible. If the equity costs
19 produced with DCF methods and assumptions chosen by an analyst are significantly
20 different than equity costs resulting from application of other financial models and checks
21 on the reasonableness of the results made by examination of authorized and earned ROEs,
22 those DCF results should be seriously questioned or rejected.

1 **Q. Please summarize your DCF estimates.**

2 A. My DCF estimates are provided in PGE Exhibit 1207, 1209 and 1210. The estimates
3 presented in PGE Exhibit 1207 are based on the constant growth DCF model and
4 forward-looking estimates of growth. PGE Exhibit 1207 relies on an average of analysts'
5 forecasts of growth reported by Zacks, Yahoo! Finance, Reuters and Value Line and finds
6 the benchmark cost of equity is 11.5%. PGE Exhibit 1209 relies on concepts the Federal
7 Energy Regulatory Commission ("FERC") used to estimate equity costs with its
8 multi-period DCF growth model, a forecast of GDP growth and ranges of the growth
9 forecasts reported by Zacks, Yahoo! Finance, Reuters and Value Line. This method finds
10 the estimated DCF equity cost for the benchmark sample is also 11.5%. PGE Exhibit 1210
11 is a multi-stage analysis which assumes three different stages of growth are expected by
12 investors and that ultimately all dividends per share ("DPS") will grow at the same rate as
13 growth in the economy as a whole. With this approach, the indicated average DCF equity
14 cost estimate is 11.2% for the sample. After recognizing PGE requires a risk premium
15 above the benchmark cost of equity estimates of 20 basis points, the indicated ROE range
16 for PGE is 11.4% to 11.7%.

17 **Q. Please explain the DCF method of estimating the cost of equity.**

18 A. The constant growth DCF model computes the cost of equity as the sum of an expected
19 dividend yield (" D_1/P_0 ") and expected dividend growth (" g "). The expected dividend yield
20 is computed as the ratio of next period's expected dividend (" D_1 ") divided by the current
21 stock price (" P_0 "). Generally, the constant growth model is computed with formula (1) or
22 (2):

23 (1) $\text{Equity Cost} = D_0/P_0 \times (1 + g) + g$

1 (2) Equity Cost = $D_1/P_0 + g$

2 where D_0/P_0 is the current dividend yield and D_1/P_0 is found by increasing the current yield
3 by the growth rate or relying on an independent forecast of D_1 . The constant growth DCF
4 model and multistage DCF models are derived from the valuation model shown in equation
5 3 below:

6 (3) $P_0 = D_1/(1+k) + D_2/(1+k)^2 + \dots + D_\infty/(1+k)^\infty,$

7 where k is the cost of equity; P_0 is the current stock price, $D_1, D_2, \dots, D_\infty$ are the cash flows
8 expected to be received in periods 1, 2, \dots, ∞ , respectively. Equation (3) is equivalent to
9 equation (4) when it is expected that the stock will be sold at price P_n at the end of period n :

10 (4) $P_0 = D_1/(1+k) + D_2/(1+k)^2 + \dots + (D+P)_n/(1+k)^n,$

11 In the case of the constant growth DCF model, DPS, earnings per share (“EPS”), stock
12 prices and book values are all assumed to grow at the same rate in every future period. In
13 multistage DCF models, after an initial period (or periods) has passed, future DPS, EPS,
14 book values and stock prices are assumed to grow at faster or slower rates than in the initial
15 stage (or stages).

16 **Q. How did you compute the dividend yields?**

17 A. My dividend yield estimates are denoted as D_1/P_0 in equation (2) above. These estimates are
18 reported in PGE Exhibit 1205. My dividend yields are averages of the highest and lowest
19 dividend yields which occurred during the period September 1, 2009 to November 30, 2009.
20 My estimates of D_1 are Value Line’s estimated dividends for the next 12 months reported by
21 Value Line in its December 4, 2009 Summary and Index which I have adjusted to
22 compensate for the time value of money.

1 **Q. Why have you adjusted the values for D_1 for the time value of money?**

2 A. This adjustment is required because equation (3) above assumes dividends are paid once a
3 year but investors receive dividend payments on a quarterly basis. If a utility pays a
4 dividend of \$100 per year, investors would prefer to be paid \$25 every quarter instead of
5 \$100 at the end of the year. Prices investors pay for utility stocks reflect the benefit
6 investors receive by utilities paying dividends every quarter but equation (3) assumes the
7 \$100 is paid only once a year. My calculation adjusts the dividend upward by just enough to
8 offset the time value of receiving the \$100 in four quarterly installments of \$25 each.

9 The values adopted for D_1 must also reflect the fact that DPS are expected to increase
10 over time since all of the utilities in the sample are projected to have growth in the future. I
11 recognize that potential positive growth by adopting Value Line's forecasts of dividends for
12 the next 12 months. Other methods could be adopted to recognize the near-term growth in
13 DPS, but I have used this conservative approach to minimize controversy. A general
14 discussion of the various approaches that could be taken is provided in Roger Morin, New
15 Regulatory Finance, pages 343-349.

16 **Q. How did you estimate growth rates?**

17 A. Growth rates used with the DCF model should be based on the best available forecasts of
18 future growth. A number of investor services report consensus averages of analysts'
19 forecasts of growth. For my analysis, I have relied on the consensus of long-term EPS
20 growth rates reported by Zacks, Reuters and Yahoo! Finance as well as long-term EPS
21 growth rates determined or reported by Value Line². PGE Exhibit 1206 provides a list of the

² Northwestern Corp is in Value Line's Small and Mid-Cap Edition and thus Value Line does not determine an estimate of future growth. Instead, it reports a consensus of five analysts' predictions of long-term EPS growth for the utility.

1 available analysts' forecasts reported for the sample utilities by the four institutions.
2 Column (e) of PGE Exhibit 1206 reports averages of the available analysts' forecasts. To be
3 included in the sample, I required that at least three of the institutions reported an estimate of
4 growth for the utility in question. Taken together, the average of the analysts' forecasts
5 provided by all four of the institutions is 6.4% at this time. Based on this average of growth
6 rate estimates and dividend yields from PGE Exhibit 1205, the indicated cost of equity for
7 the benchmark sample is 11.5% at this time. See PGE Exhibit 1207.

8 **Q. Please explain your second DCF analysis.**

9 A. My second DCF analysis is a two-stage DCF analysis based on concepts relied upon by the
10 FERC in a number of cases and fully discussed in *Southern California Edison Company*,
11 Opinion No. 445, 92 F.E.R.C. 61,070 (2000) and in Opinion 396-B, *Northwest Pipeline*
12 *Company*, 79 F.E.R.C. 61,309 (1997). The concepts I rely upon are as follows:

- 13 • Adopt averages of high equity cost estimates and low equity cost estimates to
14 determine a range of cost of equity estimates;
- 15 • Determine each equity cost with a two-stage DCF analysis in which the initial
16 growth rate is given a weight of two-thirds and the terminal growth rate is given a
17 weight of one-third;
- 18 • Adopt the FERC method of relying on EPS growth forecasts to determine initial
19 growth rates;
- 20 • Adopt the FERC method of relying on a GDP forecast as the terminal growth rate
21 estimate.

22 In making each high (low) equity cost estimate, I rely upon the highest (lowest)
23 analyst's forecast in the range of growth rates reported in PGE Exhibit 1208. With this

1 approach, the FERC method also eliminates from consideration any equity cost estimate that
2 is not greater than 40 basis points above the cost of A-rated bonds. That requirement is
3 reasonable because costs of equity for utilities should always exceed the cost of investment-
4 grade debt. In my analysis, to be conservative, I did not eliminate such equity cost
5 estimates.

6 **Q. How did you estimate GDP growth for the second stage of this two-stage analysis?**

7 A. When FERC gives a weight of one-third to GDP growth it is assumed that the second stage
8 will not start for many years into the future and therefore investors relying on this method
9 would focus primarily on expected long-term GDP growth, not GDP growth expected in the
10 next few years. Reasonable estimates of long-term GDP growth would consider not only
11 forecasts of future GDP growth but GDP growth that has occurred during long periods in the
12 past.

13 In determining my estimate of GDP growth, I considered past long-term annual
14 average GDP growth of 6.7% which Staff of the Arizona Corporation Commission relied on
15 to determine growth for the second stage of its multi-stage DCF analysis (Direct Testimony
16 for ACC Staff of Steven P. Irvine, in Docket No. W-01303A-07-0209 (Arizona-American
17 Water Company), dated October 15, 2007, page 26). I updated and revised that historical
18 average to obtain a forward-looking estimate of GDP growth by reducing the updated
19 growth rate by past average inflation of 3.1% (reported by Morningstar in Table 2-1 of
20 *Ibbotson SBBI 2009 Valuation Yearbook*), and replacing it with a forecast of the future
21 inflation of 3.0% (Value Line, *Quarterly Economic Review*, November 27, 2009) to
22 determine a forward-looking estimate of GDP growth of 6.6% (i.e., 6.7% minus 3.1% plus
23 3.0% = 6.6%). I also consider a forecast of GDP growth in 2013 from Value Line estimates

1 of future real GDP growth of 3.3% in 2013 and the future GDP deflator of 1.7% in 2013 to
2 estimate future near-term GDP growth of 5.1% ($1.051 = 1.033 \times 1.017$). These forecasts are
3 provided by Value Line in its *Quarterly Economic Review*, dated November 27, 2009.
4 Based on an average of those estimates of 6.6% and 5.1%, I determined a forward-looking
5 estimate of GDP growth of 5.8% for my analyses.

6 **Q. What are the results of your two-stage DCF analysis?**

7 A. The results are reported in PGE Exhibit 1209. The average of the high equity cost estimates
8 is 12.9% and the average of low equity cost estimates is 10.1%. The mid-point of that
9 equity cost range is 11.5%. In applying this method, I considered dropping the low equity
10 cost estimates for Edison International of 6.56% and for Great Plains Energy of 7.14%
11 because they are either below or equal to the expected future cost of Baa bonds. Compare
12 PGE Exhibit 1209 with PGE Exhibit 1211. As previously discussed, FERC's standard
13 method is to remove from consideration any estimated equity cost that is not 40 basis points
14 above the cost of A-rated bonds. Such a principle is appropriate for any equity cost
15 approach because all credible estimates of the cost of equity for utilities must be higher than
16 the yield on investment grade bonds. Baa bonds are investment grade bonds. Thus, the
17 FERC criteria places the equity cost estimates for Edison International and Great Plains
18 below the level which should be included. To be conservative, however, I have not
19 eliminated them. If they were removed, the average of low equity cost estimates of 10.1%
20 would increase to 10.3%.

21 **Q. Why is the preliminary range of equity cost estimates so wide?**

22 A. It is this wide because it is based on the highest and lowest forecasts of growth from PGE
23 Exhibit 1208, not consensus estimates of growth. While it is generally not appropriate to

1 base an equity cost estimate on either of those extreme values, the FERC approach
2 recognizes the mid-point of that range provides a reasonable equity cost estimate. Based on
3 the range of EPS growth forecasts reported by four institutions, the indicated average cost of
4 equity for the sample is 11.5% and thus the indicated cost of equity for PGE is 11.7%.

5 **Q. Please describe your third DCF analysis.**

6 A. My third DCF analysis is developed in PGE Exhibit 1210. This analysis determines the cost
7 of equity by finding the internal rate of return that is consistent with different growth rates in
8 three stages. Initially, it is assumed that an average of recent prices (“P₂₀₀₉”) and *Value*
9 *Line’s* forecasted dividends for the next 12 months reported by *Value Line* at December 4,
10 2009 in its Summary & Index (“D₂₀₁₀”) are appropriate for the analysis. Growth rates
11 adopted for the first stage (for 2011-2015, the next five years) are the averages of forecasted
12 EPS growth rates reported in PGE Exhibit 1206. I have assumed—as does the FERC—that
13 EPS growth is the critical concern of knowledgeable investors who realize that earnings
14 enable the utility to increase dividends. PGE Exhibit 1210 reports the first and last
15 forecasted dividend for this period (D₂₀₁₁ and D₂₀₁₅) for each utility.

16 The second stage is a transition stage in which growth in the first stage is assumed to
17 gradually increase (or decrease) toward a terminal growth rate over a period of ten years
18 (2016 to 2025). PGE Exhibit 1210 reports the first and last forecasted cash distributions for
19 this period (D₂₀₁₆ and (P+D)₂₀₂₅) for each utility. The terminal growth rate is assumed to be
20 GDP growth of 5.8% which I discussed above. In 2025 it is also assumed that the stocks are
21 sold and the prices paid for those stocks anticipate that DPS growth will equal GDP growth
22 in all future periods. The selling price for the respective stocks reflects GDP growth during
23 that final (third) stage.

- 1 **Q. What is your average equity cost estimate based on this third DCF approach?**
- 2 A. This analysis indicates an average cost of equity estimate for the benchmark sample
- 3 companies is 11.2% and thus the indicated cost of equity for PGE is 11.4%.

IV. Risk Premium Equity Cost Estimates

1 **Q. Please turn to your risk premium equity cost estimates. Please summarize the equity**
2 **cost estimates you make with this approach.**

3 A. I make three RP equity cost estimates that indicate the cost of equity for PGE falls in a range
4 of 10.9% to 12.0%. We do not know exactly what information investors use when they use
5 risk premium approaches to price common stocks and thus I present three alternative
6 versions of the method.

7 **Q. In general, how is an equity cost determined with a risk premium approach?**

8 A. A risk premium equity cost is made by first determining what the relationship has been
9 between equity costs and interest rates over a period of time. Then that relationship is
10 combined with a current forecast of the interest rate to predict the current cost of equity.
11 Generally such equity cost estimates depend on different assumptions about how investors
12 price stocks than are assumed when making DCF equity cost estimates.

13 **Q. Are risk premium approaches widely used in the financial community?**

14 A. Yes.

15 **Q. Please compare interest rates in the past to interest rates expected in 2011.**

16 A. In 2005, annual averages of various interest rates dropped to the lowest levels that have
17 occurred in close to forty years. From 1976 to 2002, annual average rates for Baa Corporate
18 bonds, for example, ranged from 7.80% to 16.11%. In 2005, that annual average was only
19 6.06%. For comparison, in 2009 the annual average for Baa Corporate bond rates was
20 7.29% and is expected to average 7.14% in 2011-2013. See PGE Exhibit 1211. My
21 analyses below recognize that interest rates are expected to be lower in the future than
22 during most years in the past.

1 **Q. Why have you used the period 2011-2013 to determine interest rates for your RP**
2 **analyses?**

3 A. The cost of equity estimates should be for the period when new rates will be in effect. The
4 first year in that future period is 2011. I do not know when PGE will file for different rates
5 but anticipate the new rates set for 2011 will be in effect for more than one year. As a result,
6 I have adopted the period 2011-2013 for my RP analyses.

7 **Q. Do you expect risk premiums to vary inversely with interest rates?**

8 A. Yes. There is a theoretical reason and many sources of empirical data to support equity cost
9 risk premiums increasing as interest rates decrease.

10 **Q. Why is this inverse relationship between interest rates and risk premiums important at**
11 **this time?**

12 A. It is important because interest rates in 2011-2013 are expected to be lower than historical
13 averages and thus risk premiums in 2011-2013 are expected to be higher. While interest
14 rates have increased somewhat since 2003, the average Baa rates expected in 2011-2013 are
15 lower than average Baa rates were during periods used to determine historical relationships
16 between interest rates and equity costs (and thus, risk premiums). As a result, risk premiums
17 today are expected to be higher than in the past.

18 **Q. What is the theoretical reason risk premiums are expected to increase when interest**
19 **rates decrease?**

20 A. The theoretical support is found in Myron Gordon and Paul Halpern's article, "Bond Share
21 Yield Spreads Under Uncertain Inflation," American Economic Review, Vol. 66, No. 4,
22 September 1976, pp. 559-565. In that article Gordon and Halpern explained that as
23 investors expect higher uncertain inflation, interest rates would increase to reflect greater
24 uncertainty and higher expected inflation, but costs of equity would not increase as much

1 because stocks—but not bonds—provide a hedge against inflation. This common sense
2 theory provides a strong conceptual basis for the empirical analyses discussed and applied
3 below. I note that Gordon and Halpern concluded their article with empirical support for the
4 theory based on differences in bond costs and equity costs for electric utilities. They found
5 that as Aaa bond rates increased, risk premiums for electric utilities decreased.

6 **Q. Have other authors found an inverse relationship between risk premiums and interest**
7 **rates?**

8 A. Yes. Harris and Marston, “Estimating Shareholders Risk Premia Using Analysts’ Growth
9 Rates,” Financial Management, Summer 1992 found an inverse relationship as did Roger
10 Morin in a study reported in chapter 4 of his 2006 book, New Regulatory Finance.

11 **Q. Has OPUC staff addressed this issue?**

12 A. Yes. In UT-85, Phil Nyegaard stated “Theory suggests that relatively high inflation narrows
13 the risk spread between stocks and bonds, and that relatively low inflation widens that
14 spread.” Based on this theory and data from Ibbotson and Sinquefeld, Mr. Nyegaard
15 determined the risk premium for the stock market as a whole was expected to be above the
16 long-term average because investors expected inflation (and future bond rates) to be lower
17 than the long-term average at the time he prepared that testimony. Staff/3 Nyegaard/14,
18 UT-85, January 20, 1989.

19 **Q. Have other regulators determined that risk premiums vary inversely with interest**
20 **rates?**

21 A. Yes. In California, the Public Utility Commission also determined that risk premiums vary
22 inversely with interest rates. In 1997, the CPUC found that costs of equity for energy
23 utilities move in the same direction as interest rates but by less. The table below

1 summarizes Table 3 of Decision 97-12-089, which established costs of capital for Pacific
 2 Gas and Electric Company (“PG&E”).

<u>Year</u>	<u>Forecasted Interest Rate</u>	<u>Change</u>	<u>Authorized ROE</u>	<u>Change</u>
1991	9.76%		12.92%	
1992	9.10%	-66	12.65%	-27
1993	8.32%	-78	11.85%	-80
1994	6.76%	-156	10.92%	-90
1995	8.37%	+161	12.05%	+110
1996	7.29%	-108	11.60%	-45
1997	7.92%	+63	11.60%	0
1998	7.81%	-74	11.20%	-40

3 In all but one case, the CPUC found that equity costs move in the same direction as interest
 4 rates, but the change in the cost of equity was less than the change in interest rates. More
 5 recently, in California D.02-11-027, the California PUC confirmed that its practice was to
 6 adjust returns on equity for energy utilities by one-half to two-thirds of the change in the
 7 benchmark interest rate.

8 **Q. Please describe your first risk premium analysis.**

9 A. The first approach I use is based on a method routinely used by the Department of Ratepayer
 10 Advocates of the California PUC to determine equity costs for utilities (see Division of
 11 Ratepayer Advocates, California PUC Report on the Cost of Capital, San Jose Water, June
 12 2006, Application 065-02-014). This method relies on annual averages of past recorded
 13 book returns on equity for a sample of utilities as proxies for average costs of equity. It
 14 assumes that regulators adopt rates and rate adjustment mechanisms that give utilities
 15 reasonable opportunities to earn their RROEs and thus—though each individual utility may
 16 earn more or less its RROE in a given year—the average of the sample ROEs provides a
 17 useful proxy for the average cost of equity for the sample.

1 **Q. How did you implement this method in this case?**

2 A. To make this analysis, I adopted averages of earned ROEs for the twelve surviving utilities
3 in the sample adopted by the Oregon PUC Staff in UE 180 as the proxies for annual average
4 equity costs during the years 1999 to 2008. PGE did not support Staff's sample group in
5 UE 180 and in Order No. 07-015, the Commission found estimates of the cost of equity
6 made with data for that sample were "uniformly low." Using the UE 180 Staff sample
7 group for a risk premium equity cost estimate is thus a means to provide a conservative and
8 relatively non-controversial estimate of PGE's cost of equity. To prepare this analysis, I
9 used data for annual earnings per share from 1999 to 2008 and beginning and ending book
10 values for 1998 to 2008 reported by Value Line.

11 **Q. What are the results of this first RP analysis?**

12 A. This risk premium analysis indicates the estimated average cost of equity for the surviving
13 utilities in the electric utility sample adopted by the Staff in UE-180 falls in a range of
14 10.9% to 11.3%. As expected from the evidence I presented above, the estimated average
15 risk premium in the most recent 5-year period is somewhat higher than the average range for
16 the full 10-year period. This result is expected because average interest rates were lower in
17 2004-2008 than in 1999-2008. My analysis is reported in PGE Exhibit 1212. Forecasts of
18 interest rates expected in 2010-2013 are reported in PGE Exhibit 1211.

19 **Q. What are the results of your second RP analysis?**

20 A. My second approach computes the risk premium as the average of realized market return
21 premiums over a period of time. This analysis indicates the cost of equity for a typical
22 electric utility falls in a range of 10.7% to 11.8% and thus the indicated cost of equity for
23 PGE falls in a range of 10.9% to 12.0%.

1 **Q. Please discuss this second risk premium analysis.**

2 A. The second risk premium analysis is a market approach. Results of this method are reported
3 in PGE Exhibit 1213. It is based on an average of differences between annual total realized
4 returns for Moody's index of electric utilities and yields on Baa bonds at the beginning of
5 the respective years. This approach recognizes that the annual actual risk premium in any
6 particular year will probably not equal the required risk premium but that, over a long period
7 of time, the average of those annual actual risk premiums provides a good estimate of the
8 average risk premium which was required during that period.

9 Initially, I computed two preliminary average risk premiums. The first preliminary risk
10 premium is for the period ending in the year 2000 when Moody's stopped updating this
11 index. The second preliminary estimate was for the full period ending in 2008. It is based
12 on my update of the Moody's sample using data for surviving utilities from the original
13 Moody's sample of 24 utilities with data for the period 2001 to 2008. I report the results for
14 both the original period and the updated period to determine this second RP estimate of the
15 cost of equity.

16 The preliminary analyses determine average risk premiums and thus do not incorporate
17 the expectation that risk premiums vary inversely with interest rates. Since a Baa bond rate
18 of 7.14% expected in 2011-2013 is lower than the average of Baa rates of 7.9% for the
19 period 1950 to 2008 and lower than the average interest rate of 8.1% during the period of the
20 original study, the future risk premium is expected to be slightly higher than the simple
21 average RP based on past data. To incorporate this additional information, I adjusted the
22 risk premium estimates upward by assuming the cost of equity changes by half as much as
23 the difference in Baa bond rates. This adjustment is consistent with the California PUC

1 orders I discussed above. Based on these estimates, the benchmark equity cost range is
2 10.7% to 11.8% and the indicated cost of equity for PGE falls in a range of 10.9% to 12.0%.

3 **Q. What is the conceptual basis for your third RP analysis?**

4 A. The third RP approach relies on authorized ROEs as proxies for the costs of equity for
5 electric utilities. In Docket No. ER93-465-000, Staff of the FERC adopted authorized ROEs
6 as proxies for costs of equity to implement its risk premium approach. Professor Roger
7 Morin has also adopted authorized returns on equity as proxies for costs of equity for
8 electric utilities to conduct a risk premium analysis. Roger Morin, *New Regulatory Finance*,
9 Chapter 4, Public Utility Reports, Inc., 2006. My analysis is similar to Dr. Morin's
10 approach and extends the FERC analysis by recognizing risk premiums increase (decrease)
11 as interest rates decrease (increase).

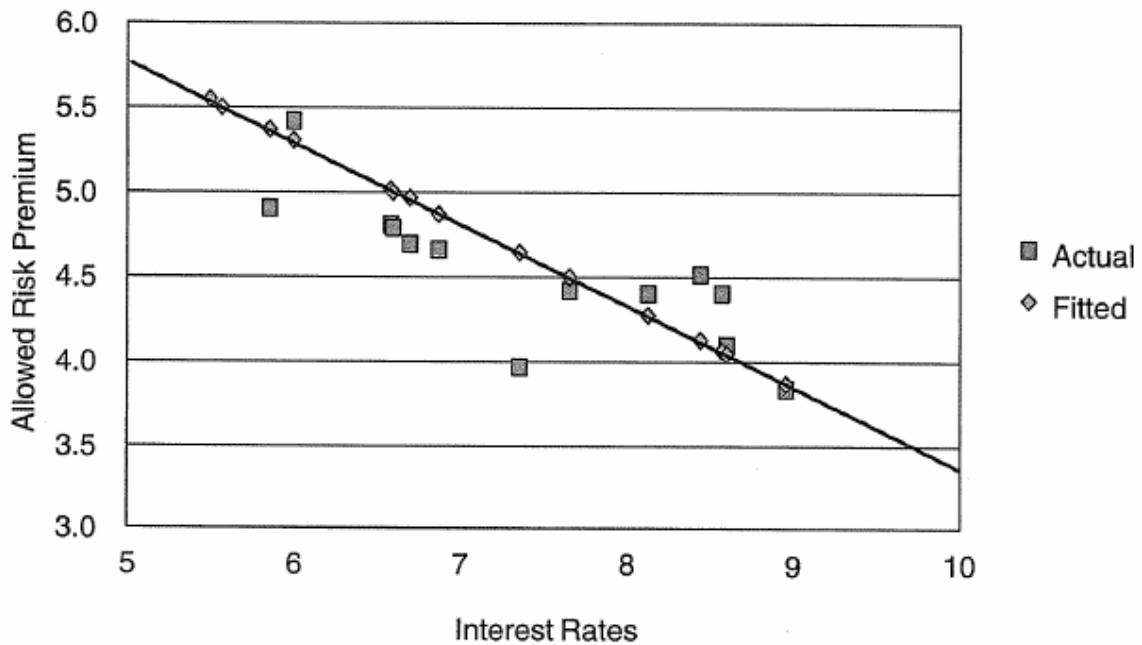
12 **Q. Please discuss Dr. Morin's approach.**

13 A. Dr. Morin reports that risk premium equity cost estimates have been used in regulatory
14 proceedings for many years and are widely used by analysts, investors and expert witnesses.
15 He notes that the RP approach to estimating the cost of equity derives its usefulness from the
16 simple fact that while equity return requirements cannot be readily quantified at any given
17 time, the returns on bonds can. Thus, if the risk premium is known, it can be used to
18 produce a useful estimate of the cost of equity. In one of his risk premium techniques, Dr.
19 Morin relies on authorized returns on equity when determining risk premiums. *New*
20 *Regulatory Finance*, page 123. Professor Morin reports the following statistical relationship
21 between risk premiums (RP) and Treasury rates (YIELD) for the period 1987 to 2005 for
22 electric utilities:

23 (5) $RP = 8.2049 - 0.4833 \times YIELD \quad R^2 = 0.81$
24 $(t = -8.4)$

1 where allowed equity returns reported by Regulatory Research Associates (“RRA”) are
2 adopted as the proxies for equity costs. To obtain a cost of equity estimate, Dr. Morin
3 inserts a current or projected Treasury bond yield in his estimated equation. He further
4 explains, “Figure 4-4 shows the clear inverse relationship between the allowed risk premium
5 and interest rates revealed in past common equity decisions.” The risk premium method
6 presented by Dr. Morin is discussed in Section 4.5 of his 2006 book and is shown
7 graphically in Figure 4-4 reproduced below:

**FIGURE 4-4
ALLOWED RISK PREMIUM VS INTEREST RATES
1987–2005**



8 The risk premiums reported in the figure are the costs of equity implied by consideration of
9 authorized ROEs relative to contemporaneous yields on long-term Treasury bonds.

1 **Q. Is your third RP approach consistent with the analysis Dr. Morin presented in his new**
2 **book?**

3 A. Yes. My third RP analysis is consistent with academic research and the analysis presented
4 by Dr. Morin in *New Regulatory Finance*, but relies on a larger sample of 491 individual
5 litigated decisions. Dr. Morin relied upon annual averages of decisions reported by RRA
6 instead of individual decisions. I have also based my analysis on Baa bond rates six months
7 prior to the dates decisions were issued by the commissions. That approach recognizes the
8 practical constraints of regulatory proceedings in which DCF, RP and other financial models
9 used to determine authorized ROEs are based on data available several months prior to the
10 issue of orders. Baa bond rates instead of Treasury rates are adopted to determine the risk
11 premiums based on the analysis presented in PGE Exhibit 1202 and discussed above.

12 **Q. What specific study did you conduct?**

13 A. I conducted an analysis with 491 observations for the period 1985 to 2008. This analysis is
14 based on more detailed data and is for a period that is longer than the 1987 to 2005 period
15 Dr. Morin used in his analysis. The results of my analysis are shown in PGE Exhibit 1214.
16 This risk premium approach indicates a typical electric utility can expect to face a cost of
17 equity of 10.9% in 2011-2013. As PGE is more risky than the typical electric utility, once a
18 20 basis point risk adjustment for PGE is recognized, this model indicates a point estimate
19 of PGE's cost of equity of 11.1%. That equity cost estimate for PGE falls within the range
20 of equity cost estimates made with the other two RP approaches and thus corroborates those
21 other analyses.

V. Authorized and Earned ROEs

1 **Q. Have you made any checks on the reasonableness of your DCF and RP equity cost**
2 **estimates?**

3 A. Yes. At page 47 of Order No. 07-015 (the UE 180 case), the Commission stated it would
4 not rely upon rates authorized in other jurisdictions to determine ROEs, but will use those
5 decisions to gauge the reasonableness of its decision. I present PGE Exhibit 1215 to provide
6 such a gauge.

7 **Q. Does PGE Exhibit 1215 provide perspective about what is a fair ROE for PGE at this**
8 **time?**

9 A. Yes. As I noted above, the U.S. Supreme Court's decisions in the 1923 Bluefield
10 Waterworks case and 1944 Hope Natural Gas Company case, as well as ORS 756.040 set
11 forth three standards for a fair ROE. In effect, Oregon and the U.S. Supreme Court require
12 the Commission to determine rates and rate adjustment mechanisms for PGE that allow the
13 Company to have a fair chance to earn its opportunity cost of capital, *i.e.*, returns investors
14 could expect to earn if they invest in other enterprises of comparable risk. A benchmark
15 sample of those other enterprises of comparable risk is the guideline sample of 31 electric
16 utilities.

17 The two obvious measures of the opportunity cost of equity that are available to
18 investors are the ROEs these benchmark utilities are currently earning and the ROEs these
19 utilities are authorized to earn. If regulators authorize rates and rate adjustment mechanisms
20 that allow utilities a reasonable chance to earn their costs of equity, since PGE is more risky
21 than the benchmark sample, either an average of earned ROEs for the sample or an average
22 of authorized ROEs provide information about the minimum ROE that should be authorized
23 for PGE.

1 PGE Exhibit 1215 provides a list of currently authorized ROEs and earned ROEs
2 reported by AUS Utility Reports in December 2009 for the utilities in PGE Exhibit 1201.
3 These data indicate the sample companies earned, on average, 10.0%. An individual earned
4 ROE, however, does not provide a useful estimate of the cost of equity if it is less than the
5 cost of investment grade debt. As FERC has recognized, such numbers do not provide
6 realistic estimates of the cost of equity and should be disregarded. Once earned returns
7 below the cost of investment grade bonds are removed from the list, the remaining average
8 of earned ROEs is 10.8%.

9 PGE Exhibit 1215 also reports the most recently authorized ROEs for the 31 sample
10 utilities as reported by AUS Utility Reports. Based on these data, the benchmark electric
11 utilities are authorized an average ROE of 10.8%.

12 **Q. Do the earned and authorized ROEs reported in PGE Exhibit 1215 depend upon the**
13 **types of models used to determine those ROEs or the assumptions used to produce**
14 **equity costs with those models?**

15 A. No, they do not. The evidence in PGE Exhibit 1215 provides a direct estimate of the
16 opportunity cost of equity that ORS 756.040 and the U.S. Supreme Court have found should
17 be considered in determining a fair rate of return on equity. The ultimate test of a fair ROE
18 is whether the rates and rate adjustment mechanisms authorized for PGE by the Oregon
19 PUC give PGE a reasonable opportunity to earn the rate of return investors could expect to
20 earn if they invested in another utility of comparable risk. The average of authorized returns
21 and realized ROEs resulting from commission decisions reported in PGE Exhibit 1215
22 provide a gauge indicating the equity cost estimates I present above are indeed reasonable.
23 Once a risk premium of 20 basis points is recognized, the indicated fair ROE for PGE is
24 11.0%.

VI. Summary and Conclusions

1 **Q. Please summarize your testimony.**

2 A. The fair rate of return for PGE should be determined by recognizing that PGE faces a
3 number of risks previously recognized by the Commission, and other risks discussed by Mr.
4 Valach, Mr. Hager, and me. PGE continues to require a risk adjustment of 10 basis points to
5 compensate for its exposure to the wholesale market. Once decoupling and other risk
6 factors are considered, PGE requires a combined risk adjustment of no less than 20 basis
7 points to compensate for its above-average risks.

8 My equity cost estimates are summarized in PGE Exhibit 1216. Initially, I turned to
9 benchmark DCF estimates based on data for a sample of 31 electric utilities. My first
10 estimate for the benchmark sample of 11.5% is based on the constant growth DCF model
11 and consensus estimates of future EPS growth reported by Reuters, Zacks, Yahoo! Finance
12 and Value Line. My second benchmark DCF estimate of 11.5% is based on concepts used
13 by FERC, a range of growth estimates presented in PGE Exhibit 1206 by the four
14 institutions, and a forecast of future GDP growth. This approach assumes investors expect
15 two-stage growth with growth in the terminal stage being growth in GDP. Based on this
16 analysis, the indicated required ROE for Portland General is 11.7%. My third DCF
17 approach determines an internal rate of return for each of the benchmark sample companies
18 from an examination of expected growth in three future stages. It assumes investors expect
19 growth rates that gradually increase or decrease toward future GDP growth. Based on that
20 analysis, the average equity cost for the sample is 11.2% and the indicated RROE for PGE is
21 11.4%.

22 In section IV, I explain why risk premiums are expected to vary inversely with interest
23 rates and summarize Gordon and Halpern's theory that supports such a relationship. I then

1 present three risk premium studies that used different methods to determine risk premiums:
2 one bases risk premiums on realized book returns on average equity, one determines risk
3 premiums from averages of holding period returns and the other determines risk premiums
4 from a statistical analysis of past authorized returns for electric utilities in which the cases
5 were litigated. Taken together, the risk premium analyses support a benchmark ROE range
6 of 10.7% to 11.8% and an equity cost range of 10.9% to 12.0% for PGE.

7 I also provide some perspective and checks on my estimates of RROEs. I show that if
8 authorized and earned ROEs for companies in my DCF benchmark sample were considered
9 along with a risk adjustment for PGE of 20 basis points, the indicated fair ROE for PGE
10 would be 11.0%. Taking into account all of the data presented in PGE Exhibit 1216, I
11 estimate PGE's cost of equity falls in a range of 10.9% to 12.0% and recommend it be
12 authorized an ROE of no less than 11.0%.

13 **Q. Is PGE'S requested ROE of 10.5% reasonable?**

14 A. Yes, it is. A 10.5% ROE is below the bottom of my range of equity cost estimates and thus
15 is a conservative request.

VII. Qualifications of Thomas M. Zepp

1 **Q. What is your profession and background?**

2 A. I am an economist and Vice President of Utility Resources, Inc., a consulting firm. I
3 received my Ph.D. in Economics from the University of Florida. Prior to jointly establishing
4 our consulting firm in 1985, I was a consultant at Zinder Companies from 1982-1985.
5 Between 1976 and 1982, I was a senior economist on the staff of the Oregon Public Utility
6 Commissioner. In that position, I conducted studies and prepared testimony on a number of
7 economic and financial issues and estimated fair rates of return for many of the utilities
8 regulated by the Commissioner. Prior to 1976, I taught business and economics courses at
9 the graduate and undergraduate levels at the University of Florida, Central Michigan
10 University and the Joint Graduate Program of Armstrong and Savannah State Colleges.

11 I have been deposed or testified on various topics before regulatory commissions, courts
12 and legislative committees in states of Alaska, Arizona, California, Colorado, Georgia,
13 Hawaii, Idaho, Illinois, Iowa, Kentucky, Minnesota, Montana, Nebraska, Nevada, New
14 Mexico, Oklahoma, Oregon, Tennessee, Utah, Washington, West Virginia, and Wyoming,
15 before two Canadian regulatory authorities and before four Federal agencies. In addition to
16 cost of capital studies, I have testified as to values of utility properties, incremental costs of
17 energy and telecommunications services, and appropriate rate designs.

18 **Q. What cost of capital studies have you prepared before?**

19 A. I have submitted studies or testified on cost of capital and other financial issues before the
20 Interstate Commerce Commission, Bonneville Power Administration, and courts or
21 regulatory agencies in fifteen states.

1 My studies and testimony have included consideration of the financial health and fair
2 rates of return for General Telephone of the Northwest, Illinois Bell Telephone, Nevada Bell
3 Telephone, Pacific Northwest Bell, US WEST, Alaska Power Company, Anchorage
4 Municipal Light & Power, Black Bear Lake Hydro, Inc., Commonwealth Edison, Idaho
5 Power, Iowa-Illinois Gas and Electric, Pacific Power & Light, Portland General Electric,
6 Puget Sound Power & Light, Cascade Natural Gas, Mountain Fuel Supply, Northern Illinois
7 Gas, Northwest Natural Gas, Anchorage Water Utility, Anchorage Wastewater Utility,
8 Arizona Water Company, Arizona-American Water Company, California-American Water
9 Company, California Water Service, Chaparral City Water Company, Dominguez Water
10 Company, Golden State Water Company, Hawaii-American Water Company, Kentucky-
11 American Water Company, Mountain Water Company, New Mexico-American Water
12 Company, New Mexico Utilities, Inc., Oregon Water Company, Paradise Valley Water
13 Company, Park Water Company, San Gabriel Valley Water Company, San Jose Water
14 Company, Southern California Water Company, Suburban Water System, Tennessee-
15 American Water Company, and Valencia Water Company. I have also prepared estimates
16 of the appropriate rates of return for a number of hospitals in Washington, a large insurance
17 company, and U.S. railroads.

18 **Q. Do you have other professional experience related to cost of capital issues?**

19 A. Yes. My article, "Utility Stocks and the Size Effect - Revisited," was published in the
20 *Quarterly Review of Economics and Finance*, Vol. 43, Issue 3, Autumn 2003, pp. 578-582.
21 Also, I published an article "Water Utilities and Risk," *Water the Magazine of the National*
22 *Association of Water Companies* Vol. 40, No. 1 Winter 1999 and was an invited speaker on
23 the topic of risk of water utilities at the 57th Annual Western Conference of Public Utility

1 Commissioners in June 1998. I presented a paper "Application of the Capital Asset Pricing
2 Model in the Regulatory Setting" at the 47th Annual Southern Economic Association
3 Conference and published an article "On the Use of the CAPM in Public Utility Rate Cases:
4 Comment," *Financial Management* Autumn 1978, pp. 52-56. I have been a journal referee
5 for the *International Review of Economics and Finance* and *Financial Management*. While
6 on the staff of the Oregon PUC, I also established a sample of over 500,000 observations of
7 common stock returns and measures of risk and conducted a number of studies related to the
8 use of various methods to estimate costs of equity for utilities. I was invited to Stanford
9 University to discuss that research.

10 **Q. Does this complete your prefiled testimony?**

11 A. Yes.

List of Exhibits

<u>PGE Exhibit</u>	<u>Description</u>
1201	Comparison of PGE and the DCF Electric Utilities Sample
1202	Past and Current Spreads Between Treasury Rates and Baa Bonds
1203	Utilities in Peer Group Analysis with PCAMs for Electric Operations in All States
1204	Evidence Showing Risk Increases as the Market Values of Companies Decrease
1205	Current Annualized Average Dividend Yields for Electric Utilities Sample
1206	Estimates of Growth Based on Analysts' Forecasts Reported by Value Line, Reuters, Yahoo! Finance and Zacks
1207	Application of the Constant Growth DCF Model
1208	Range of Growth Rates Reported by Four Investor Services
1209	Application of the FERC Multi-period DCF Method
1210	Alternative Multi-Stage DCF Growth Analysis
1211	Forecasts of Treasury and Baa Corporate Bond Rates
1212	Risk Premium Analysis: Method Used by Department of Ratepayer Advocates of the California PUC with Data for Oregon PUC Sample - 1999 to 2008
1213	Risk Premium Analysis Based on Holding Period Returns for Moody's Electric Utilities Sample as Updated, 1950 to 2008
1214	Risk Premiums Determined by Relationship between Authorized ROEs and Baa Corporate Bond Rates During the Period 1985-2008
1215	Earned and Authorized ROEs for Electric Utilities Sample
1216	Estimated Costs of Equity for Benchmark Samples and PGE