Exhibit No. ___T (DCP-1T)
Docket UE-152253
Witness: David C. Parcell

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PACIFIC POWER & LIGHT COMPANY,** **Respondent.**	**DOCKET UE-152253**

TESTIMONY OF

DAVID C. PARCELL

ON BEHALF OF THE STAFF OF WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Cost of Capital

March 17, 2016

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I. INTRODUCTION

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

A. My name is David C. Parcell. I am President and Senior Economist of Technical Associates, Inc. My business address is Suite 130, 1503 Santa Rosa Rd., Richmond, Virginia 23229.

Q. Please summarize your educational background and professional experience.

A. I hold B.A. (1969) and M.A. (1970) degrees in economics from Virginia Polytechnic Institute and State University (Virginia Tech) and a M.B.A. (1985) from Virginia Commonwealth University. I have been a consulting economist with Technical Associates since 1970. I have provided cost of capital testimony in public utility ratemaking proceedings dating back to 1972. In this regard, I have previously filed testimony and/or testified in over 525 utility proceedings before about 50 regulatory agencies in the United States and Canada. I have previously filed testimony on behalf of the Staff of the Washington Utilities and Transportation Commission (Commission) in proceedings involving Puget Sound Energy and Avista Corp. as well as Pacific Power & Light Company. Exhibit No. DCP-2 provides a more complete description of my education and relevant work experience.

Q. What is the purpose of your testimony in this proceeding?

A. I have been retained by the Commission Staff to evaluate the cost of capital ("COC") aspects of the current rate case of Pacific Power & Light Company ("Pacific Power"), a division of PacifiCorp ("PacifiCorp" or "Company"). I have performed independent studies and I am making recommendations of the current COC for PacifiCorp. In addition, since PacifiCorp is owned by Berkshire Hathaway Energy ("BHE"), I have also evaluated this entity in my analyses.

Q. How is your testimony organized?

A. PacifiCorp's application "does not propose to change any element in its cost of capital."[1] As a result, the Company is proposing to use the same COC, including capital structure percentages and cost rates that were adopted by the Commission in PacifiCorp's last rate proceeding.[2] PacifiCorp's COC request is being made in conjunction with its requests for the implementation of a decoupling mechanism and a two-year rate plan.[3]

Q. Have you prepared an exhibit in support of your testimony?

A. Yes, In addition to Exhibit No. DCP-2, identified above, I have prepared Exhibit Nos. DCP-3 through DCP-14. These exhibits were prepared either by me or under my direction. The information contained in these exhibits is correct to the best of my knowledge and belief

[1] Exh. No. RBW-1T 2:13-14.
[2] *Wash. Utils. & Transp. Comm'n v. Pacific Power & Light Co.*, Docket UE-140762, Order 08, 10, ¶ 16 (March 25, 2015) (Pacific Power 2016 GRC Order).
[3] Exh. No. RBD-1T 2–3.

II. RECOMMENDATIONS AND SUMMARY

Q. What is your recommendation in this proceeding?

A. My overall COC recommendation for PacifiCorp is shown on Exhibit No. DCP-3 and is summarized as follows:

Item	Percent	Cost		Weighted Cost	
Short-Term Debt	0.19%	2.15%		0.00%	
Long-Term Debt	50.69%	5.21%		2.64%	
Preferred Stock	0.02%	6.75%		0.00%	
Common Equity	49.10%	9.0% 9.25% 9.50%	4.42%	4.54%	4.66%
Total	100.0%		7.07%	7.19%	7.31%

PacifiCorp's application requests a COC of 7.30 percent and a cost of equity ("ROE") of 9.50 percent. These match the respective COC and ROE authorized by the Commission in the Company's last rate proceeding.

Q. Please summarize your analyses and conclusions.

A. This proceeding is concerned with PacifiCorp regulated electric utility operations in Washington. My analyses concern the Company's COC. The first step in performing these analyses is to develop the appropriate capital structure. As noted above, PacifiCorp proposes use of the same capital structure adopted by the Commission in the previous rate proceeding, which is consistent with the capital structure I proposed in that proceeding. I also use this capital structure, which I continue to believe is the proper capital structure for the Company.

The second step in a cost of capital calculation is to determine the embedded cost rates of debt and preferred stock. As noted, PacifiCorp proposes to use the same rates as those adopted by the Commission in the prior proceeding. In contrast, I propose use of PacifiCorp's test year cost rates for long-term debt, short-term debt and common equity.

The third step in the COC calculation is to estimate the ROE. I employ three recognized methodologies to estimate PacifiCorp's ROE, each of which I apply to two proxy groups of electric utilities. These three methodologies and my findings are:

Methodology	Range
Discounted Cash Flow ("DCF")	8.5%-9.5% (9.00% mid-point)
Capital Asset Pricing Model ("CAPM")	6.7
Comparable Earnings ("CE")	9.0%-10.0% (9.50% mid-point)

Based upon these finding, I conclude that PacifiCorp's ROE is within a range of 9.0 percent to 9.5 percent, which is based upon the mid-point of the range of the results for the DCF and CE models.[4] PacifiCorp's COC witness Strunk endorses the Company's proposed ROE of 9.50 percent, although he maintains that he would be recommending a 10.00 percent ROE if the Company were not requesting the same COC as adopted by the Commission in the last proceeding.

Combining these three steps into the weighted COC results in an overall rate of return of 7.07 percent to 7.31 percent (which incorporates a 9.0 percent to 9.50 percent ROE). My specific COC recommendation is the mid-point of this range, or 7.19 percent (9.25 percent ROE).

[4] As I indicate in a later section, my ROE recommendation does not directly incorporate the CAPM results, which I believe to be somewhat low at this time, relative to the DCF and CE results.

III. ECONOMIC/LEGAL PRINCIPLES AND METHODOLOGIES

Q. What are the primary economic and legal principles that establish the standards for determining a fair rate of return for a regulated utility?

A. Public utility rates are normally established in a manner designed to allow the recovery of their costs, including capital costs. This is frequently referred to as "cost of service" ratemaking. Rates for regulated public utilities traditionally have been primarily established using the "rate base – rate of return" concept. Under this method, utilities are allowed to recover a level of operating expenses, taxes, and depreciation deemed reasonable for rate-setting purposes, and are granted an opportunity to earn a fair rate of return on the assets utilized (i.e., rate base) in providing service to their customers.

The rate base is derived from the asset side of the utility's balance sheet as a dollar amount and the rate of return is developed from the liabilities/owners' equity side of the balance sheet as a percentage. Thus, the revenue impact of the cost of capital is derived by multiplying the rate base by the rate of return, including income taxes.

The rate of return is developed from the cost of capital, which is estimated by weighting the capital structure components (i.e., debt, preferred stock, and common equity) by their percentages in the capital structure and multiplying these values by their cost rates. This is also known as the weighted cost of capital.

Technically, "fair rate of return" is a legal and accounting concept that refers to an <u>ex post</u> (after the fact) earned return on an asset base, while the cost of capital is an economic and financial concept which refers to an <u>ex ante</u> (before the fact) expected, or required, return on a capital base. In regulatory proceedings, however, the two terms are often used interchangeably, and I have equated the two concepts in my testimony.

From an economic standpoint, a fair rate of return is normally interpreted to mean that an efficient and economically managed utility will be able to maintain its financial integrity, attract capital, and establish comparable returns for similar risk investments. These concepts are derived from economic and financial theory and are generally implemented using financial models and economic concepts.

Although I am not a lawyer and I do not offer a legal opinion, my testimony is based on my understanding that two United States Supreme Court decisions provide the controlling standards for a fair rate of return. The first decision is *Bluefield Water Works and Improvement Co. v. Public Serv. Comm'n of West Virginia*, 262 U.S. 679 (1923). In this decision, the Court stated:

> The annual rate that will constitute just compensation depends upon many circumstances and must be determined by the exercise of fair and enlightened judgment, having regard to all relevant facts. 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 economical 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.

It is generally understood that the *Bluefield* decision established the following standards for a fair rate of return: comparable earnings, financial integrity, and capital attraction. It also noted that required returns change over time, and there is an underlying assumption that the utility be operated efficiently.

The second decision is *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1942). In that decision, the Court stated:

> The rate-making process under the [Natural Gas] Act, i.e., the fixing of 'just and reasonable' rates, involves a balancing of the investor and consumer interests. . . . From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By this standard the 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.

The three economic and financial parameters in the *Bluefield* and *Hope* decisions – comparable earnings, financial integrity, and capital attraction – reflect the economic criteria encompassed in the "opportunity cost" principle of economics. The opportunity cost principle provides that a utility and its investors should be afforded an opportunity (not a guarantee) to earn a return commensurate with returns they could expect to achieve on investments of similar risk. The opportunity cost principle is consistent with the fundamental premise on which regulation rests, namely, that it is intended to act as a surrogate for competition.

Q. How can the *Bluefield* and *Hope* parameters be employed to estimate the cost of capital for a utility?

A. Neither the courts nor economic/financial theory has developed exact and mechanical procedures for precisely determining the cost of capital. This is the case because the cost of capital is an opportunity cost and is prospective-looking, which dictates that it must be estimated. However, there are several useful models that can be employed to assist in estimating the ROE, which is the capital structure item that is the most difficult to determine. These include the DCF, CAPM, CE and risk premium ("RP") methods. I have not directly employed a RP model in my analyses although, as discussed later, my CAPM analysis is a form of the RP methodology. Each of these methodologies will be described in more detail later in my testimony.

IV. GENERAL ECONOMIC CONDITIONS

Q. Are economic and financial conditions important in determining the costs of capital for a public utility?

A. Yes. The costs of capital, for both fixed-cost (debt and preferred stock) components and common equity, are determined in part by current and prospective economic and financial conditions. At any given time, each of the following factors has an influence on the costs of capital:

- The level of economic activity (i.e., growth rate of the economy);
- The stage of the business cycle (i.e., recession, expansion, or transition);
- The level of inflation;
- The level and trend of interest rates; and,
- Current and expected economic conditions.

My understanding is that this position is consistent with the *Bluefield* decision that noted "[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." Bluefield, 262 U.S. at 693.

Q. What indicators of economic and financial activity did you evaluate in your analyses?

A. I examined several sets of economic statistics from 1975 to the present. I chose this time period because it permits the evaluation of economic conditions over four full business cycles, allowing for an assessment of changes in long-term trends. Consideration of economic/financial conditions over a relatively long period of time allows me to assess how such conditions have had impacts on the level and trends of the costs of capital. This period also approximates the beginning and continuation of active rate case activities by public utilities, which generally began in the mid-1970s.

A business cycle is commonly defined as a complete period of expansion (recovery and growth) and contraction (recession). A full business cycle is a useful and convenient period over which to measure levels and trends in long-term capital costs because it incorporates the cyclical (i.e., stage of business cycle) influences and, thus, permits a comparison of structural (or long-term) trends.

Q. Please describe the timeframes of the four prior business cycles and the current cycle.

A. The four prior complete cycles and current cycle cover the following periods:

Business Cycle	Expansion Cycle	Contraction Period
1975-1982	Mar. 1975-July 1981	Aug. 1981-Oct. 1982
1982-1991	Nov. 1982-July 1990	Aug. 1990-Mar. 1991
1991-2001	Mar. 1991-Mar. 2001	Apr. 2001-Nov. 2001
2001-2009	Nov. 2001-Nov. 2007	Dec. 2007-June 2009
Current	July 2009-	

Source: National Bureau of Economic Research, "Business Cycle Expansions and Contractions.[5]

Q. Do you have any general observations concerning the recent trends in economic conditions and their impact on capital costs over this broad period?

A. Yes, I do. From the early 1980s until the end of 2007, the United States economy had enjoyed general prosperity and stability. This period had been characterized by longer economic expansions, relatively tame contractions, low and declining inflation, and declining interest rates and other capital costs.

However, in 2008 and 2009, the economy declined significantly, initially as a result of the 2007 collapse of the "sub-prime" mortgage market and the related liquidity crisis in the financial sector of the economy. Subsequently, this financial crisis intensified with a more broad-based decline, initially based on a substantial increase in petroleum prices and a dramatic decline in the U.S. financial sector, culminating with the collapse and/or bailouts of a significant number of well-known institutions such as Bear Stearns, Lehman Brothers, Merrill Lynch, Freddie Mac, Fannie Mae, AIG and Wachovia. The recession also witnessed the demise of national companies such as Circuit City and the bankruptcies of automotive manufacturers such as Chrysler and General Motors.

This decline has been described as the worst financial crisis since the Great Depression and has been referred to as the "Great Recession." Beginning in 2008, the

[5] http://www.nber.org/cycles/cyclesmain.html.

U.S. and other governments implemented unprecedented actions to attempt to correct or minimize the scope and effects of this recession.

The recession reached its low point in mid-2009, when the economy began to expand again, although at a slow and uneven rate. However, the length and severity of the recession, as well as a relatively slow and uneven recovery, indicate that the impacts of the recession have been and will be felt for an extended period of time.

Q. Please describe recent and current economic and financial conditions and their impact on the cost of capital.

A. One impact of the Great Recession has been a reduction in actual and expected investment returns and a corresponding reduction in the costs of capital. This decline is evidenced by a decline in both short-term and long-term interest rates and the expectations of investors and is reflected in ROE model results (such as DCF, CAPM and CE). Regulatory agencies throughout the United States have recognized the decline in capital costs by authorizing lower ROEs for regulated utilities.

Exhibit No. DCP-4 shows several sets of relevant economic and financial statistics for the cited time periods. Pages 1 and 2 contain general macroeconomic statistics; pages 3 and 4 show interest rates; and pages 5 and 6 contain equity market statistics.

Pages 1 and 2 show that in 2007 the economy subsequently entered a significant decline, as indicated by the growth in real (i.e., adjusted for inflation) Gross Domestic Product ("GDP"), industrial production, and an increase in the unemployment rate. This recession lasted until mid-2009, making it a longer-than-normal recession, as well as a much deeper recession. Since then, economic growth has been somewhat erratic and the economy has grown slower than the prior expansions.

Pages 1 and 2 also show the rate of inflation. As reflected in the Consumer Price Index ("CPI"), for example, inflation rose significantly during the 1975-1982 business cycle and reached double-digit levels in 1979-1980. The rate of inflation has declined substantially since 1981. Since 2008, the CPI has been 3 percent or lower, with 2013 being only 1.5 percent and both 2014 and 2015 being below 1 percent. It is thus apparent that the rate of inflation has generally been declining over the past several business cycles. Recent and current levels of inflation are at the lowest levels of the past 35 years, which is reflective of lower capital costs.[6]

Q. What have been the trends in interest rates over the four prior business cycles and at the current time?

A. Pages 3 and 4 show several series of interest rates. Both short-term and long-term rates rose sharply to record levels in 1975-1981 when the inflation rate was high. Interest rates declined substantially in conjunction with inflation since the early 1980's.

From 2008 to late 2015, the Federal Reserve System ("Federal Reserve") maintained the Federal Funds rate (i.e., short-term interest rate) at 0.25 percent, an all-time low. The Federal Reserve recently raised it slightly to 0.50 percent. The Federal Reserve also purchased U.S. Treasury securities to stimulate the economy.[7] As seen on

[6] The rate of inflation is one component of interest rate expectations of investors, who generally expect to receive a return in excess of the rate of inflation. Thus, a lower rate of inflation has a downward impact on interest rates and other capital costs.

[7] This is referred to as Quantitative Easing which was comprised of three "rounds." In "round" 3, known as QE3, the Federal Reserve initially purchased some $85 billion of U.S. Treasury Securities per month in order to stimulate the economy. The Federal Reserve eventually "tapered" its purchase of U.S. Treasury securities through October 2014, at which time Quantitative Easing ended.

page 4, in 2012, both U.S. and corporate bond yields declined to their lowest levels in the past four business cycles and in more than 35 years. Even with the "tapering" and eventual ending of the Federal Reserve's Quantitative Easing program, interest rates have remained low. Currently, both government and corporate lending rates remain at historically low levels, again reflective of lower capital costs.

Q. What does this exhibit show for trends of common share prices?

A. Pages 5 and 6 show several series of common stock prices and ratios. These indicate that stock prices were essentially stagnant during the high inflation/high interest rate environment of the late 1970s and early 1980s. The 1983-1991 business cycle and the more recent cycles witnessed a significant upward trend in stock prices. The beginning of the recent financial crisis saw stock prices decline precipitously, as stock prices in 2008 and early 2009 were down significantly from peak 2007 levels, reflecting the financial/economic crisis. Beginning in the second quarter of 2009, prices recovered substantially and ultimately reached and exceeded the levels achieved prior to the "crash." On the other hand, recent equity markets have been somewhat volatile.

Q. What conclusions do you draw from your discussion of economic and financial conditions?

A. Recent economic and financial circumstances have differed from any that have prevailed since at least the 1930s. The late 2008-early 2009 deterioration in stock prices, the decline in U.S. Treasury bond yields, and an increase in corporate bond yields were evidenced in the then-evident "flight to safety." Concurrently, there was a decline in capital costs and returns, which significantly reduced the value of most retirement accounts, investment portfolios and other assets. One significant aspect of this has been a decline in investor expectations of returns,[8] even with the return of stock prices to levels achieved prior to the "crash." This evident in several ways: 1) lower interest rates on bank deposits; 2) lower interest rates on U.S. Treasury and corporate bonds; 3), lower increases in social security cost of living benefits;[9] and 4), lower authorized ROEs by regulatory commissions. Finally, as noted above, utility bond interest rates are currently at levels below those prevailing prior to the financial crisis of late 2008 to early 2009 and are near the lowest levels in the past 35 years. It is also noteworthy that long-term interest rates have declined slightly in recent months, in spite of the Federal Reserve's raising of short-term rates in December of 2015.

Q. How do these economic/financial conditions impact the determination of a ROE for regulated utilities?

A. The costs of capital for regulated utilities have declined in recent years. For example, the current interest costs that utilities pay on new debt remain near the low point of the last several decades. In addition, the results of the traditional ROE models (i.e., DCF, CAPM and CE) are lower than was the case prior to the Great Recession. In light of this, it is not surprising that the average ROEs authorized by state regulatory agencies have declined and continued to decline through 2015, as follows:

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[8] *See*, for example, Kiplinger's Personal Finance, "Investors Brace for Smaller Gains, Focus on Long-Term," August 30, 2015.

[9] The 2015 increase in Social Security benefits was 1.70 percent – near an all-time low. There is no increase in 2016 Social Security benefits.

Year	Electric[10]	Natural Gas
2012	10.01%	9.94%
2013	9.94%	9.68%
2014	9.76%	9.78%
2015	9.58%	9.60%

V. PACIFICORP'S OPERATIONS AND BUSINESS RISKS

Q. Please describe PacifiCorp and its operations.

A. PacifiCorp is a regulated electric utility that generates, transmits and distributes electricity to customers in Washington. Pacific Power is a division of PacifiCorp and operates as a "trade name" of PacifiCorp in Washington, California and Oregon. PacifiCorp also operates in Utah, Wyoming and Idaho under the "trade name" of Rocky Mountain Power. Prior to March 21, 2006, PacifiCorp was owned by ScottishPower.

Q. Please describe PacifiCorp's ownership structure.

A. As noted above, Pacific Power is a division of PacifiCorp, which is an indirect subsidiary of BHE.[11] BHE's other U.S. utility subsidiaries are:

Nevada Power;
Sierra Pacific Power;
Mid-American Energy;
Northern Natural Gas;
Kern River Gas Transmission; and,
BHE Transmission.

[10] Average ROE values for electric utilities exclude Virginia surcharge/rider generation cases that incorporate plan-specific ROE premiums. *See* Regulatory Research Associates, Regulatory Focus, January 16, 2014, page 1.
[11] BHE was previously named Mid-American Energy Holding Company.

In 2015, 91 percent of BHE's operating income was generated by rate-regulated businesses.[12]

BHE also has several other subsidiaries. The major non-U.S. utility subsidiaries are:

Northern Powergrid Holdings (United Kingdom);
BHE Renewables, LLC;
CalEnergy Philippines; and,
Home Services of America, Inc.

Q. What are the current security ratings of Pacific Power and PacifiCorp?

A. Pacific Power, as a division of PacifiCorp, does not issue its own securities directly to investors, but rather is a component of PacifiCorp. It follows that Pacific Power does not have rated securities. The current ratings of PacifiCorp are as follows:

Rating Agency	Senior Unsecured	Senior Secured
Moody's	A3	A1
S&P	A-	A
Fitch	A	A+

(Source: Response to UTC-146)

Q. What have been the recent trends in PacifiCorp's debt ratings?

A. This is shown on Exhibit No. DCP-5. PacifiCorp's debt has been rated in the "Single A" category by all three rating agencies since at least 2010.

Q. How do the bond ratings of PacifiCorp compare to other electric utilities?

A. As I indicated in a previous answer, PacifiCorp has single A bond ratings on its senior debt, which are investment grade (i.e., Triple-B or above). Of the 48 electric utilities and

[12] Berkshire Hathaway Energy Co., Dec. 31, 2015, Form 10-K, page 1.

combination gas and electric utilities covered by AUS Utility Reports, the following numbers of bond ratings currently exist:

Moody's Rating	Number of Companies	S&P Rating	Number of Companies
Aa2	1	AA	-
Aa3	-	AA-	1
A1*	1	A+	--
A2	7	A*	3
A3	18	A-	18
Baa1	11	BBB+	11
Baa2	7	BBB	9
Baa3	--	BBB-	3
Ba or less	--	BB	--
NR	3	NR	3

* PacifiCorp's ratings.

This comparison indicates that PacifiCorp's ratings are above the most common rating categories of most electric utilities. This is indicative of a lower financial risk for PacifiCorp.

VI. CAPITAL STRUCTURE, COSTS OF DEBT AND PREFERRED STOCK

Q. What is the importance of determining a proper capital structure in a regulatory framework?

A. A utility's capital structure is important because the concept of rate base – rate of return regulation requires the capital structure to be utilized in estimating the total cost of capital. Within this framework, it is proper to ascertain whether the utility's capital structure is appropriate relative to its level of business risk and relative to other utilities.

As discussed in Section III of my testimony, the purpose of determining the proper capital structure for a utility is to ascertain its capital costs. The rate base – rate of return concept recognizes the assets employed in providing utility services and provides for a return on these assets by identifying the liabilities and common equity (and their cost rates) used to finance the assets. In this process, the rate base is derived from the asset side of the balance sheet and the COC is derived from the liabilities/owners' equity side of the balance sheet. The inherent assumption in this procedure is that the dollar values of the capital structure and the rate base are approximately equal and the former is utilized to finance the latter.

The common equity ratio (i.e. the percentage of common equity in the capital structure) is the capital structure item which normally receives the most attention. This is the case because common equity: (1) usually commands the highest cost rate; (2) generates associated income tax liabilities; and (3) causes the most controversy since its cost cannot be precisely determined.

Q. What are the historic capital structure ratios of PacifiCorp and BHE?

A. I have examined the historic (2011-2015) capital structure ratios of PacifiCorp and BHE. See Exhibit No. DCP-6. PacifiCorp's common equity ratios have been:

	Including S-T Debt	Excluding S-T Debt
2011	51.3%	53.9%
2012	52.5%	52.6%
2013	53.2%	53.2%
2014	52.4%	52.4%
2015	51.1%	51.2%

Correspondingly, BHE's common equity ratios have been:

	Including S-T Debt	Excluding S-T Debt
2011	41.4%	42.5%
2012	42.1%	43.2%
2013	36.7%	36.9%
2014	33.8%	34.6%
2015	37.0%	37.6%

This indicates that BHE, on a consolidated basis, has maintained a capital structure with substantially less equity than PacifiCorp.

Page 3 of Exhibit No. DCP-6 reflects the 2015 capital structure ratios of PacifiCorp and the other electric utility subsidiaries of BHE. As is shown there, this indicates that PacifiCorp's equity ratio is among the highest of BHE's electric subsidiaries.

Q. How do these capital structures compare to those of investor-owned electric utilities?

A. Exhibit No. DCP-7 shows the common equity ratios (including short-term debt in capitalization) for the groups of electric and combination electric utilities followed by AUS Utility Reports. These are:

Year	Electric	Combination Gas And Electric
2011	47%	46%
2012	47%	46%
2013	48%	47%
2014	47%	47%
2015*	48%	47%

(Source: AUS Utility Reports)
* As of September 30.

These equity ratios are lower than those of PacifiCorp.

Q. What capital structure is PacifiCorp requesting in this proceeding?

A. PacifiCorp is proposing the following capital structure ratios, which reflects the capital structure adopted by the Commission in the Company's last rate proceeding.

Short-Term Debt	0.19%
Long-Term Debt	50.69%
Preferred Stock	0.02%
Common Equity	49.10%

Q. Do you believe this is a proper capital structure to use for determining PacifiCorp's COC?

A. Yes, I do. This capital structure is consistent with the recent capital structures of other electric utilities. It also matches the equity ratio used by this Commission in the most recent PacifiCorp rate proceedings.

Q. What is your understanding of this Commission's recent policy on the proper capital structure to use to determine the COC?

A. It is my understanding that the Commission's policy on determining a capital structure balances safety (the preservation of investment quality credit ratings and access to capital) against economy (the lowest overall cost to attract and maintain capital). *WUTC v. Puget Sound Energy, Inc.*, Dockets UE-040640 and UG-040641, Order 06, ¶ 27 (February 18, 2005). The Commission noted that the appropriate capital structure can either be the Company's historical capital structure, the projected capital structure, or a hypothetical capital structure.

Q. Is your recommended capital structure consistent with this policy?

A. Yes. The capital structure that I use is similar to recent actual ratios and is consistent with the capital structure of other utilities. I also believe that the hypothetical capital structure that I propose provides a "balance of safety and economy" as cited above.

Q. What are the cost rates of debt and preferred stock in the Company's application?

A. PacifiCorp's filing requests a cost of long term debt of 5.18 percent, a cost of short-term debt of 1.73 percent, and a cost of preferred stock of 6.75 percent. Each of these is the same as the cost rates adopted by the Commission in the prior proceeding. I propose use of the actual test year cost rates in my COC analyses. I note, on the other hand, there is very little difference between the 5.21 percent current cost of long-term debt and the 5.18 percent historic cost proposed by PacifiCorp. The updated cost rate of short-term debt (2.15 percent) exceeds the historic rate (1.73 percent) but the very small percentage of short-term debt in the capital structure negates any meaningful impact.

Q. Can the ROE be determined with the same degree of precision as the cost of debt?

A. No. The cost rates of debt are largely determined by interest payments, issue prices, and related expenses. The ROE, on the other hand, cannot be precisely quantified, primarily because this cost is an opportunity cost. As mentioned previously, there are several models that can be employed to estimate the ROE. Three of the primary methods – DCF, CAPM, and CE – are developed in the following sections of my testimony.

VII. SELECTION OF PROXY GROUPS

Q. How have you estimated the ROE for PacifiCorp?

A. PacifiCorp is not a publicly-traded company. Its parent company (BHE) is also not publicly-traded. Consequently, it is not possible to directly apply ROE models to either PacifiCorp or BHE. However, in COC analyses, it is customary to analyze groups of comparison, or "proxy," companies as a substitute for PacifiCorp to determine its ROE.

I have accordingly selected such a group for comparison to PacifiCorp. In conjunction with PacifiCorp's decision to use the same COC adopted in its last proceeding, I have used the same proxy group I developed in that proceeding. Exhibit No. DCP-8 shows certain operational risk characteristics of this group.

In addition, I have conducted studies of the ROE for the electric utilities proxy group that was selected by PacifiCorp witness Strunk.

Q. Please explain why you are using two proxy groups in your cost of equity analyses.

A. It has long been my practice to develop my own independently-determined proxy group and to also conduct ROE analyses on the utility witness' proxy group. My conclusions and recommendations, in turn, are based upon the results of both proxy groups.

VIII. DCF ANALYSIS

Q. What is the theory and methodological basis of the DCF model?

A. The DCF model is one of the oldest and most commonly-used models for estimating the ROE for public utilities. The DCF model is based on the "dividend discount model" of financial theory, which maintains that the value (price) of any security or commodity is the discounted present value of all future cash flows.

The most common variant of the DCF model assumes that dividends are expected to grow at a constant rate (the "constant growth" or "Gordon DCF model"). In this framework, the ROE is derived from the following formula:

$$K = \frac{\mathrm{D}}{\mathrm{P}} + \mathrm{g}$$

where: P = current price
D = current dividend rate
K = discount rate (cost of capital)
G = constant rate of expected growth

This formula essentially recognizes that the return expected or required by investors is comprised of two factors: the dividend yield (current income) and expected growth in dividends (future income).

Q. Please explain how you employ the DCF model.

A. I use the constant growth DCF model. In doing so, I combine the current dividend yield for each of the proxy utility stocks described in the previous section with several indicators of expected dividend growth.

Q. How did you derive the dividend yield component of the DCF equation?

A. Several methods can be used to calculate the dividend yield component. These methods generally differ in the manner in which the dividend rate is employed (i.e., current versus future dividends or annual versus quarterly compounding variant, which is expressed as follows:

$$Yield = \frac{D_0(1 + 0.5g)}{P_0}$$

This dividend yield component recognizes the timing of dividend payments and dividend increases.

The P_0 in my yield calculation is the average of the high and low stock price for each proxy company for the most recent three month period (December 2015 – February 2016). The D_0 is the current annualized dividend rate for each proxy company.

Q. How do you estimate the dividend growth component of the DCF equation?

A. The DCF model's dividend growth rate component is usually the most crucial and controversial element involved in using this methodology. The objective of estimating the dividend growth component is to reflect the growth expected by investors that is embodied in the price (and yield) of a company's stock. As such, it is important to recognize that individual investors have different expectations and consider alternative indicators in deriving their expectations. This is evidenced by the fact that every investment decision resulting in the purchase of a particular stock is matched by another investment decision to sell that stock.

A wide array of indicators exists for estimating investors' growth expectations. As a result, it is evident that investors do not always use one single indicator of growth. It therefore is necessary to consider alternative dividend growth indicators in deriving the growth component of the DCF model. I have considered five indicators of growth in my DCF analyses. These are:

1. Years 2011-2015 (5-year average) earnings retention, or fundamental growth;
2. Five-year average of historic growth in earnings per share (EPS), dividends per share (DPS), and book value per share (BVPS);
3. Years 2016, 2017 and 2018-2020 projections of earnings retention growth (per Value Line);
4. Years 2012-2014 to 2018-2020 projections of EPS, DPS, and BVPS (per Value Line); and
5. Five-year projections of EPS growth (per First Call).

I believe this combination of growth indicators is a representative and appropriate set with which to begin the process of estimating investor expectations of dividend growth for the groups of proxy companies. I also believe that these growth indicators reflect the types of information that investors consider in making their investment decisions. As I indicated previously, investors have an array of information available to them, all of which would be expected to have some impact on their decision-making process.

Q. Please describe your DCF calculations.

A. Exhibit No. DCP-9 presents my DCF analysis. Page 1 shows the calculation of the "raw" (i.e., prior to adjustment for growth) dividend yield for each proxy company. Pages 2 and 3 show the growth rates for the groups of proxy companies. Page 4 shows the DCF calculations, which are presented on several bases: mean, median, low and high values. These results can be summarized as follows:

	Mean	Median	Mean Low[13]	Mean High[14]	Median Low[13]	Median High [14]
Parcell Proxy Group	8.8%	8.7%	7.6%	10.6%	7.4%	9.3%
Strunk Proxy Group	8.2%	8.0%	7.7%	8.5%	7.5%	8.7%

I note that the individual DCF calculations shown on Exhibit No. DCP-9 should not be interpreted to reflect the expected cost of capital for individual companies in the proxy groups; rather, the individual values shown should be interpreted as alternative information considered by investors.

Q. What do you conclude from your DCF analyses?

A. The DCF rates resulting from the analysis of the proxy groups fall into a wide range between 7.4 percent and 10.6 percent. The highest DCF rates are 8.5 percent to 10.6 percent. I note that the 10.6 percent rate is significantly influenced by the recent historic growth of a single company, which just completed a major acquisition.

I believe a range of 8.5 percent to 9.5 percent represents the current DCF-derived ROE for the proxy groups. This range includes most of the highest DCF rates and generally exceeds the low and mean/median DCF rates. I recommend a DCF ROE of 9.0 percent for PacifiCorp, which focuses on the highest DCF rates and exceeds the low and mean/median DCF rates.

IX. CAPM ANALYSIS

Q. Please describe the theory and methodological basis of the CAPM.

[13] Using the lowest growth rate.
[14] Using only the highest growth rate.

A. CAPM was developed in the 1960s and 1970s as an extension of modern portfolio theory (MPT), which studies the relationships among risk, diversification, and expected returns. The CAPM describes and measures the relationship between a security's investment risk and its market rate of return.

Q. How is the CAPM derived?

A. The general form of the CAPM is:

$$K = R_f + \beta(R_m - R_f)$$

where: K = cost of equity
R_f = risk free rate
R_m = return on market
β = beta
R_m-R_f = market risk premium

The CAPM is a variant of the RP method. I believe the CAPM is generally superior to the simple RP method because the CAPM specifically recognizes the risk of a particular company or industry (i.e., beta), whereas the simple RP method assumes the same ROE for all companies exhibiting similar bond ratings or other characteristics.

Q. What do you use for the risk-free rate?

A. The first input of the CAPM is the risk-free rate (R_f). The risk-free rate reflects the level of return that can be achieved without accepting any risk.

In CAPM applications, the risk-free rate is generally recognized by use of U.S. Treasury securities. Two general types of U.S. Treasury securities are often utilized as the R_f component, short-term U.S. Treasury bills and long-term U.S. Treasury bonds.

I have performed CAPM calculations using the three-month average yield (December 2015-February 2016) for 20-year U.S. Treasury bonds. I use the yields on long-term Treasury bonds since this matches the long-term perspective of ROE analyses. Over this three month period, these bonds had an average yield of 2.43 percent.

Q. What is beta and what betas do you employ in your CAPM?

A. Beta is a measure of the relative volatility (and thus risk) of a particular stock in relation to the overall market. Betas less than 1 are considered less risky than the market, whereas betas greater than 1 are more risky. Utility stocks traditionally have had betas below 1. I utilize the most recent Value Line betas for each company in my proxy group.

Q. How do you estimate the market risk premium component?

A. The market risk premium component (R_m-R_f) represents the investor-expected premium of common stocks over the risk-free rate, or long-term government bonds. For the purpose of estimating the market risk premium, I considered alternative measures of returns of the S&P 500 (a broad-based group of large U.S. companies) and 20-year U.S. Treasury bonds (i.e., the same timeframe as employed in Morningstar sources used to develop risk premiums).

First, I compared the actual annual returns on equity of the S&P 500 with the actual annual yields of U.S. Treasury bonds. Exhibit No. DCP-10 shows the ROE for the S&P 500 group for the period 1978-2014 (all available years reported by S&P). This schedule also indicates the annual yields on 20-year U.S. Treasury bonds and the annual differentials (i.e., risk premiums) between the S&P 500 and U.S. Treasury 20-year bonds.

Based upon these returns, I conclude that the risk premium from this analysis is 6.85 percent.

I next considered the total returns (i.e., dividends/interest plus capital gains/losses) for the S&P 500 group as well as for long-term government bonds, as tabulated by Morningstar (formerly Ibbotson Associates), using both arithmetic and geometric means. I considered the total returns for the entire 1926-2014 period, which are as follows:

	S&P 500	L-T Gov't Bonds	Risk Premium
Arithmetic	12.1%	6.1%	6.0%
Geometric	10.1%	5.7%	4.4%

I conclude from this analysis that the expected risk premium is about 5.75 percent (i.e., the average of all three risk premiums: 6.85 percent from Schedule 8; 6.0 percent arithmetic and 4.4 percent geometric from Morningstar). I believe that a combination of arithmetic and geometric means is appropriate since investors have access to both types of means[15] and presumably, both types are reflected in investment decisions and thus, stock prices and the ROE.

Q. What are your CAPM results?

A. Exhibit No. DCP-11 shows my CAPM calculations. The results are:

	Mean	Median
Parcell Proxy Group	6.7%	6.7%
Strunk Proxy Group	6.7%	6.7%

[15] For example, Value Line uses compound (i.e., geometric) growth rates in its projection. In addition, mutual funds report growth rates on a compound basis.

Q. What is your conclusion concerning the CAPM ROE?

A. The CAPM results collectively indicate a ROE of 6.7 percent for the groups of proxy utilities. I conclude that an appropriate CAPM ROE estimation for PacifiCorp is 6.70 percent.

X. CE ANALYSIS

Q. Please describe the basis of the CE methodology.

A. The CE method is derived from the "corresponding risk" concept discussed in the *Bluefield* and *Hope* cases. This method is thus based upon the economic concept of opportunity cost. As previously noted, the ROE is an opportunity cost: the prospective return available to investors from alternative investments of similar risk.

The CE method is designed to measure the returns expected to be earned on the original cost book value of similar risk enterprises. Thus, it provides a direct measure of the fair return, since it translates into practice the competitive principle upon which regulation rests.

The CE method normally examines the experienced and/or projected return on book common equity. The logic for examining returns on book equity follows from the use of original cost rate base regulation for public utilities, which uses a utility's book common equity to determine the cost of capital. This cost of capital is, in turn, used as the fair rate of return which is then applied (multiplied) to the book value of rate base to establish the dollar level of capital costs to be recovered by the utility. This technique is thus consistent with the rate base – rate of return methodology used to set utility rates.

Q. How do you apply the CE methodology in your analysis of PacifiCorp's ROE?

A. I apply the CE methodology by examining realized ROE for the group of proxy companies, as well as unregulated companies, and evaluating investor acceptance of these returns by reference to the resulting market-to-book ratios ("M/B"). In this manner it is possible to assess the degree to which a given level of return equates to the COC. It is generally recognized for utilities that an M/B of greater than one (i.e., 100 percent) reflect a situation where a company is able to attract new equity capital without dilution (i.e., above book value). As a result, one objective of a fair cost of equity is the maintenance of stock prices at or above book value. There is no regulatory obligation to set rates designed to maintain an M/B significantly above one.

I further note that my CE analysis is based upon market data (through the use of M/Bs) and is thus essentially a market test. As a result, my CE analysis is not subject to the criticisms occasionally made by some who maintain that past earned returns do not represent the cost of capital. In addition, my CE analysis also uses prospective returns and thus is not backward looking.

Q. What time periods do you examine in your CE analysis?

A. My CE analysis considers the experienced ROEs of the proxy groups of utilities for the period 2002-2015 (i.e., the last fourteen years). The CE analysis requires that I examine a relatively long period of time in order to determine trends in earnings over at least a full business cycle. Further, in estimating a fair level of return for a future period, it is important to examine earnings over a diverse period of time in order to avoid any undue influence from unusual or abnormal conditions that may occur in a single year or shorter period. Therefore, in forming my judgment of the current cost of equity, I focused on two periods: 2009-2015 (the current business cycle) and 2002-2008 (the most recent business cycle). I have also considered projected ROEs for 2016 and 2018-2020.

Q. Please describe your CE analysis.

A. Exhibit No. DCP-12 and Exhibit No. DCP-13 contain summaries of experienced ROEs and M/Bs for three groups of companies, while Exhibit No. DCP-14 presents a risk comparison of utilities versus unregulated firms.

Exhibit No. DCP-12 shows the ROEs and M/Bs for the groups of proxy utilities. These can be summarized as follows:

	Parcell Proxy Group	Strunk Proxy Group
Historic ROE		
Mean	9.4-10.2%	10.1-11.1%
Median	9.4-9.8%	9.8-10.4%
Historic M/B		
Mean	137-157%	149-158%
Median	133-145%	140-150%
Prospective ROE		
Mean	9.0-10.3%	9.9-10.6%
Median	9.0-10.0%	9.5-10.0%

These results indicate that historic ROEs of 9.4 percent to 11.1 percent have been adequate to produce M/Bs of 133 percent to 158 percent for the groups of utilities. Furthermore, projected ROEs for 2016, 2017 and 2018-2020 are within a range of 9.0 percent to 10.6 percent for the utility groups. These relate to 2015 M/B of 160 percent or greater.

Q. Do you also review the earnings of unregulated firms?

A. Yes. As an alternative, I also examine the S&P's 500 Composite group. This is a well recognized group of firms that is widely utilized in the investment community and is indicative of the competitive sector of the economy. Exhibit No. DCP-13 presents the earned ROEs and M/Bs for the S&P 500 group over the past thirteen years (i.e., 2002-2014). As this schedule indicates, over the two business cycle periods, this group's average ROEs ranged from 12.4 percent to 13.6 percent, with average M/Bs ranging between 220 percent and 275 percent.

Q. How can the above information be used to estimate PacifiCorp's ROE?

A. The recent ROE of the proxy utilities and S&P 500 groups can be viewed as an indication of the level of return realized and expected in the regulated and competitive sectors of the economy. In order to apply these returns to the ROE for the proxy utilities, however, it is necessary to compare the risk levels of the electric utilities and the competitive companies. I do this in Exhibit No. DCP-14, which compares several risk indicators for the S&P 500 group and the electric utility groups. The information in this exhibit indicates that the S&P 500 group is more risky than the electric utility proxy groups.

Q. What ROE is indicated by your CE analysis?

A. Based on recent and prospective ROEs and M/Bs, my CE analysis indicates that the ROE for the proxy utilities is no more than 9.0 percent to 10.0 percent (9.5 percent mid-point). Recent ROEs of 9.4 percent to 11.1 percent have resulted in M/Bs more than 130 percent. Prospective ROEs of 9.0 percent to 10.6 percent have been accompanied by M/Bs over

160 percent. As a result, it is apparent that authorized returns below this level would continue to result in M/Bs of well above 100 percent. As I indicated earlier, the fact that M/Bs substantially exceeds 100 percent indicates that historic and prospective ROEs of 9.5 percent reflect earning levels that are well above the actual cost of equity for those regulated companies. I also note that a company whose stock sells above book value can attract capital in a way that enhances the book value of existing stockholders, thus creating a favorable environment for financial integrity. Finally, I note that my 9.0 percent to 10.0 percent CE recommendation generally reflects the actual and prospective ROEs for the proxy groups. I have made no adjustments to these return levels to reflect the high M/B.

XI. RETURN ON EQUITY RECOMMENDATION

Q. Please summarize the results of your three ROE analyses.

A. My three ROE analyses produced the following:

	Mid-Point	Range
DCF	9.0%	8.5-9.5%
CAPM	6.7%	
CE	9.5%	9.0-10.0%

These results indicate an overall broad range of 6.7 percent to 9.5 percent, which focuses on the respective individual model results. I recommend a ROE range of 9.0 percent to 9.5 percent for PacifiCorp. This range includes my DCF result (9.0 percent), and my CE result (9.5 percent).

Q. It appears that your CAPM results are less than your DCF and CE results. Do you directly consider the CAPM results in determining the ROE for PacifiCorp?

A. Not at this time. I have conducted CAPM studies in my ROE analyses for many years. It is apparent that the CAPM results are currently significantly less than the DCF and CE results. There are two reasons for the lower CAPM results. First, risk premiums are lower currently than was the case in prior years. This is the result of lower equity returns that have been experienced beginning with the Great Recession and continuing over the past several years. This is also reflective of a decline in investor expectations of equity returns and risk premiums. Second, the level of interest rates on U.S. Treasury bonds (i.e., the risk free rate) has been lower in recent years. This is partially the result of the actions of the Federal Reserve System to stimulate the economy. This also impacts investor expectations of returns in a negative fashion.

I note that, initially, investors may have believed that the decline in Treasury yields was a temporary factor that would soon be replaced by a rise in interest rates. However, this has not been the case as interest rates have remained low and continued to decline for the past five-plus years. As a result, it cannot be maintained that low interest rates (and low CAPM results) are temporary and do not reflect investor expectations. Consequently, the CAPM results should be considered as one factor in determining the cost of equity for PacifiCorp. Even though I do not factor the CAPM results directly into my ROE recommendation, I do believe these lower results are indicative of the recent and continuing decline in utility COC, including ROE.

XII. TOTAL COST OF CAPITAL

Q. What is the total cost of capital four PacifiCorp?

A. Exhibit No. DCP-3 reflects the COC for PacifiCorp using the Company's proposed capital structure and embedded costs of debt and preferred stock, as well as my ROE recommendations. The resulting total cost of capital is a range of 7.05 percent to 7.30 percent. I recommend a COC of 7.19 percent for PacifiCorp, which incorporates a ROE of 9.25 percent.

Q. As part of its current rates application, PacifiCorp is requesting a decoupling mechanism and a two-year rate plan. Are these factors that should be considered in establishing PacifiCorp's ROE?

A. Yes, they are. The establishment of a decoupling mechanism and a two-year rate plan are positive factors for PacifiCorp from a financial standpoint, as has been recognized by rating agencies.[16]

I note that mechanisms such as these are becoming more common among electric utilities, as noted in the Moody's report cited above. In addition, I am aware that this Commission has indicated that it does not consider it appropriate to "support a discrete adjustment to ROE to account for particularized risks"[17] As a result, I am not recommending any specific downward adjustment to PacifiCorp's ROE to reflect the risk-reducing impacts of these mechanisms. On the other hand, I believe that the potential adoption of these mechanisms is risk-reducing to PacifiCorp. As a result, I

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[16] For example, Moody's November 6, 2015, Report titled "2016 Outlook – US Regulated Utilities: Credit-Supportive Regulatory Environment Drives Stable Outlook."

[17] *In Re Petition of Puget Sound Energy, Inc. and Northwest Energy Coalition for an Order Authorizing PSE to Implement Electric and Natural Gas Decoupling Mechanisms and To Record Accounting Entries Associated With the Mechanisms*, Docket UE-121697, Order 14, ¶ 156 (June 29, 2015).

believe that the Company's ROE should be no greater than the mid-point of the "range of reasonableness" that the Commission finds appropriate in this proceeding.

Q. Does this conclude your direct testimony?

A. Yes, it does.