Exh. DCP-1T
Dockets UE-170033/UG-170034
Witness: David C. Parcell

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**DOCKETS UE-170033 and UG-170034 (*Consolidated*)**

TESTIMONY OF

DAVID C. PARCELL

ON BEHALF OF STAFF OF WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Cost of Capital

June 30, 2017

TABLE OF CONTENTS

LIST OF EXHIBITS

I. INTRODUCTION

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

A. My name is David C. Parcell. I am a Principal 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 and I have previously filed testimony and/or testified in over 550 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 Avista, Cascade Natural Gas, and Pacific Power & Light Company, as well as Puget Sound Energy. Exh. 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 electric and natural gas rate cases of Puget Sound Energy, Inc.

("PSE"). I have performed independent studies and I am making recommendations of the current COC for PSE.

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

A. Yes. In addition to Exh. DCP-2 identified above, I have prepared Exh. DCP-3 through DCP-15. 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.

II. RECOMMENDATIONS AND SUMMARY

Q. What are your COC recommendations in this proceeding?

A. My overall COC recommendations for PSE are shown on Exh. DCP-3 and can be summarized as follows:

Item	Percent	Cost			Weighted Cost		
Short-Term Debt	1.0%	3.06%			0.03%		
Long-Term Debt	51.0%	5.73%			2.92%		
Common Equity	48.0%	8.85%	9.20%	9.50%	4.25%	4.42%	4.56%
Total	100.0%				7.20%	7.37%	7.51%

PSE's application requests a COC of 7.74 percent and a cost of equity ("ROE") of 9.80 percent.[1]

[1] Lohse, Exh. BJL-1T at 2, Table 1.

Q. Please summarize your analyses and conclusions.

A. This proceeding is concerned with PSE's regulated electric utility and natural gas operations in Washington. My analyses concern the Company's COC. Traditionally, PSE has not distinguished between its electric and natural gas operations from a COC perspective.[2] I have followed this tradition in my COC analyses and thus focus on PSE's capitalization and single costs of debt and ROE for both its electric and natural gas operations.

The first step in performing my COC analyses is to develop the appropriate capital structure. PSE proposes use of a capital structure comprised of 48.5 percent common equity, 50.5 percent long-term debt and 1.0 percent short-term debt. I do not use this capital structure; rather I propose that the 48.0 percent equity ratio adopted in PSE's most recent cases[3] be continued, which I believe remains the proper capital structure for the Company.

The second step in a COC calculation is to determine the embedded cost rates of debt. PSE proposes use of a 3.06 percent cost of short-term debt and 5.73 percent cost of long-term debt, which are PSE's estimates of the cost rates for the Rate Year ending December 31, 2018.[4] I also use these proposed cost rates for short-term debt and long-term debt.

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

[2] Lohse, Exh. BJL-1T at 4:9-14.
[3] *Wash. Utils. & Transp. Comm'n v. Puget Sound Energy, Inc.*, Dockets UE-111048 and UG-111049, Order 08 (May 7, 2012).
[4] Lohse, Exh. BJL-4.

Methodology	Range
Discounted Cash Flow ("DCF")	8.7%-9.0% (8.85% mid-point)
Capital Asset Pricing Model ("CAPM")	6.5%-7.0% (6.75% mid-point)
Comparable Earnings ("CE")	9.0%-10.0% (9.50% mid-point)

Based upon these findings, I conclude that PSE's ROE is within a range of 8.85 percent to 9.5 percent, which is based upon the mid-point of the range of the results for the DCF model and the mid-point of the range of results for the CE model.[5] I specifically recommend the approximate mid-point of this range (9.20 percent) for PSE.

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

[5] 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.

of the balance sheet as a percentage. Thus, the revenue impact of the COC is derived by multiplying the rate base by the rate of return, including income taxes.

The rate of return is developed from the COC, 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 ex post (after the fact) earned return on an asset base, while the COC is an economic and financial concept which refers to an ex ante (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 COC for a utility?

A. Neither the courts nor economic/financial theory has developed exact and mechanical procedures for precisely determining the COC. This is the case because the COC 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."[6]

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 plus the current cycle 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

[6] *Bluefield*, 262 U.S. at 693.

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: The National Bureau of Economic Research, "U.S. Business Cycle Expansions and Contractions."[7]

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

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

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 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 U.S. and other governments implemented unprecedented actions intended 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 negative impacts of the recession have been felt for an extended period of time.

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

A. One impact of the Great Recession has been a reduction in actual and expected investment returns and a corresponding reduction in capital costs. 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 U.S. have recognized the decline in capital costs by authorizing lower ROEs for regulated utilities in each of the last several years.[8]

[8] Regulatory Research Associates, "Regulatory Focus," January 18, 2017.

Exh. DCP-4 shows several sets of relevant economic and financial statistics for the cited time periods. Page 1 contains general macroeconomic statistics; page 2 shows interest rates; and page 3 contains equity market statistics.

Page 1 shows that in 2007 the economy stalled and subsequently entered a significant decline, as indicated by the lower growth rate in real (i.e., adjusted for inflation) Gross Domestic Product ("GDP"), lower levels of 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 in prior expansions.

Page 1 also shows the rate of inflation. As reflected in the Consumer Price Index ("CPI"), 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 both 2014 and 2015 being below 1 percent and 2016 being 2.1 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.[9]

[9] 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.

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

A. Page 2 shows 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 have declined substantially in conjunction with the corresponding declines in 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 subsequently raised it slightly to 0.50 percent in December of 2015, to 0.75 percent in December of 2016, to 1.00 percent in March of 2017 and again to 1.25 percent in June of 2017. The Federal Reserve also purchased U.S. Treasury securities until 2014 to stimulate the economy.[10]

As seen on page 2, since 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, as well as the Federal Reserve's raising of the Federal Funds rate, interest rates have remained low. Currently, both government and corporate long-term lending rates remain near historically low levels, again reflective of lower capital costs. Long-term utility yields have declined slightly in 2017, after rising in late 2016, in spite of the Federal Reserve actions cited above.

[10] 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.

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

A. Page 3 shows 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 to 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[11] even with the return of stock prices to levels achieved prior to the "crash."[12] This is evident in several ways: 1) lower interest rates on

[11] *See*, e.g., Kiplinger's Personal Finance, "Investors Brace for Smaller Gains, Focus on Long-Term," August 30, 2015.
[12] *See*, e.g., Vanguard News & Perspectives. "Stabilization, Not Stagnation: Expect Modest Returns," March 30, 2017, www.personal.vanguard.com/us/insights/artical/infographic-stabilization-032017.

bank deposits; 2) lower interest rates on U.S. Treasury and corporate bonds; 3) lower increases in social security cost of living benefits;[13] 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. Even with the increase in long-term rates in late 2016 and 2017, they still remain well below the levels prevailing at the beginning of 2016.

Q. How do these economic/financial conditions impact the determination of a return on equity 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 equity returns authorized by state regulatory agencies declined through 2016, as follows:[14]

Year	Electric	Natural Gas
2007	10.31%	10.22%
2008	10.37%	10.39%
2009	10.52%	10.22%
2010	10.29%	10.15%
2011	10.19%	9.91%
2012	10.01%	9.93%
2013	9.81%	9.68%
2014	9.75%	9.78%
2015	9.60%	9.60%
2016	9.60%	9.49%

[13] The 2015 increase in Social Security benefits was 1.70 percent – near an all-time low. There was no increase in 2016 Social Security benefits and only a 0.3 percent increase for 2017 benefits.
[14] Average ROE values for "General Rate Cases," which exclude Limited Issue Rider cases. *See* Regulatory Research Associates, Regulatory Focus, January 18, 2017, pages 1, 6, and 7.

V. PUGET SOUND ENERGY'S OPERATIONS AND BUSINESS RISKS

Q. Please describe PSE and its operations.

A. PSE is a regulated combination electric and natural gas utility that generates, transmits and distributes electricity to about 1.1 million customers and natural gas to 790,000 customers in the Puget Sound area of Western Washington.[15]

Q. Please describe PSE's ownership structure.

A. PSE is a subsidiary of Puget Energy ("PE"), which was formed in 1997 by the merger of Puget Sound Power and Light Company and Washington Energy Company (parent of Washington Natural Gas Co.). PE existed as a publicly-traded entity until 2009, when it was acquired by a group of private investors (Macquarie Group) in a leveraged private equity buyout. PE is now a Washington-based holding company whose operations are conducted through PSE.

Q. What are the security ratings of PSE?

A. The current ratings of PSE are as follows:

Rating Agency	Issuer Rating	Senior Secured
Moody's	Baa1	A2
S&P	BBB	A-

(Source: PSE Response to UTC Staff Data Request No. 030).

As this indicates, PSE has "split" single A/triple B ratings.

[15] Source: Puget Sound Energy website.

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

A. This is shown on Exh. DCP-5. Each of PSE's Moody's debt ratings increased by two "notches" over the nine-year period 2009 to 2017.

Q. Why were PSE's ratings upgraded by Moody's?

A. PSE's ratings were upgraded by Moody's in 2011. Moody's provided the following rationale with respect to a March 16, 2011 "Rating Action: Moody's Upgrades Puget Energy and Puget Sound Energy; Outlook Stable.":[16]

> **RATINGS RATIONALE**
>
> Today's rating action is reflective of a number of considerations including the relative stability in operations observed following the company's purchase by a consortium of investors in February 2009, as well as the progress being made to extend the maturity profile of the debt at the PE level that was used to help finance the acquisition.
> . . .
> The Baa2 (senior unsecured) ratings for PSE, reflect the relatively low risk utility operations, collaborative regulatory relationships and recent credit supportive rate case outcomes, efficient handling of electric and gas supply needs, acceptable credit metrics for the rating category, and continued access to its own committed bank credit facilities plus indirect access to the parent's committed capital expenditure facility to supplement internal cash flow.

In addition, Moody's upgraded PSE in 2014 (along with most other electric and gas utilities). Moody's provided the following rationale with respect to a January 30, 2014 "Rating Action: Moody's Upgrades Puget Energy to Baa3 from Ba1 and Puget Sound to Baa1 from Baa2; Outlooks are Stable.":[17]

> Moody's Investors Service upgraded the ratings of Puget Energy (Puget; including its long-term issuer rating to Baa3 from Ba1) and the ratings of its operating subsidiary Puget Sound Energy (PSE; including its long-term issuer rating to Baa1 from Baa2). Moody's also affirmed the commercial

[16] Provided in PSE Response to Public Counsel Data Request No. 266, Attachment B.
[17] Provided in PSE Response to Public Counsel Data Request No. 266, Attachment C.

paper rating of PSE at P-2. This rating action completes our review of Puget and PSE initiated on November 8, 2013. The outlooks for both Puget and PSE are stable.

"The rating upgrades for Puget and PSE primarily reflect an improved rate design framework in Washington, which will translate to enhanced cost recovery and opportunity for Puget and PSE to improve earned returns" said Ryan Wobbrock, Assistant Vice President.

RATINGS RATIONALE

The primary driver of today's rating action is Moody's more favorable view of the relative credit supportiveness of the US regulatory framework, as detailed in our September 23, 2013 Request for Comment: "Proposed Refinements to the Regulated Utilities Rating Methodology and our Evolving View of US Utility Regulation." Factors supporting this view include better cost recovery provisions, reduced regulatory lag, and generally fair and open relationships between utilities and regulators. The US utility sector's low number of defaults, high recovery rates, and generally strong financial metrics from a global perspective provide additional corroboration for these upgrades.

The rating upgrades for Puget and PSE acknowledges an expectation for sustained improvement in Puget and PSE's financials, due to supportive regulatory treatment. For example, the most recent rate case decision for PSE included the Washington Utilities and Transportation Commission (WUTC) allowance for an electric and gas revenue decoupling mechanism and provided for a series of predetermined annual delivery rate increases, including cost escalation factors.

Puget and PSE's ratings reflect relatively low risk utility operations and a collaborative regulatory relationship with the WUTC. The ratings also considers an improving financial profile that incorporates a relatively high degree of holding company leverage at Puget, which is the reason for double notching (due to structural subordination and upstream dividend limitations) between the Puget and PSE.

Both of these upgrades reflect Moody's recognition of favorable regulatory mechanisms adopted by the Commission, including the decoupling mechanism adopted in 2013.

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

A. As I indicated in a previous answer, PSE has single A bond ratings on its senior debt, as well as triple B ratings on its issuer ratings, all of which are investment grade (i.e., triple-B or above). Of the 41 electric utilities and combination gas and electric utilities covered by Value Line, the following numbers of bond ratings (issuer debt) exist currently:

Moody's Rating	Number of Companies	S&P Rating	Number of Companies
Aa2	1	AA-	1
A1	1	A+	--
A2	7	A	3
A3	19	A-	18
Baa1*	12	BBB+	11
Baa2	7	BBB*	10
Baa3	--	BBB-	2
Ba or less	--	BB	--
NR	3	NR	4

* PSE's ratings.

This comparison indicates that PSE's ratings are just below the most common rating categories of most electric utilities but well within the investment grade categories. This implies that PSE has similar risk to that of the industry of which it is a part.

Q. Does PSE have access to any favorable regulatory mechanisms?

A. Yes. PSE has access to a number of regulatory mechanisms that are beneficial to the Company from a financial standpoint. These include:[18]

> "Decoupling Filings – The Washington Commission has allowed PSE to record a monthly adjustment to its electric and natural gas operating revenues related to electric transmission and distribution, natural gas operations and general administrative costs from residential, commercial and industrial customers. This monthly adjustment mitigates the effects of abnormal weather, conservation impacts and changes in usage patterns per

[18] Puget Energy, Inc./Puget Sound Energy, Inc., 2016 Form 10-K, pages 10-12.

customer. As a result, these electric and natural gas revenues will be recovered on a per customer basis regardless of actual consumption levels."

Electric Rate Filings

- Power Cost Adjustment Mechanism
- Federal Incentive Tracker Tariff
- Power Cost Only Rate Case
- Electric Property Tax Tracker Mechanism
- Electric Conservation Rider

Natural Gas Rate Filings

- Purchased Gas Adjustment
- Cost Recovery Mechanism
- Natural Gas Property Tax Tracker Mechanism
- Natural Gas Conservation Rider

Q. Do these mechanisms reduce the risk of PSE?

A. Yes, they do. Collectively and individually, these mechanisms have the effect of transferring a portion of PSE's risk from its shareholders to its customers. This is the case since the timing and risk of fully recovering certain expenses is reduced or eliminated.

Q. Are regulatory mechanisms a relatively new aspect of public utility regulation?

A. No, they are not. A brief history of regulatory mechanisms was provided in an October 2, 2015 report by Regulatory Research Associates, titled "Adjustment Clauses – a State-By-State Overview." This report stated (note that the term "Adjustment Clauses" was used in the report, which is a type of regulatory mechanism):

> The electric and natural gas utilities' use of adjustment clauses to recover variations in certain costs outside of the traditional rate case process had its origins in the 1973 Arab oil embargo, when fuel prices skyrocketed

> leaving the utilities with no way to recover the increased costs in a timely manner.
> . . .
> The result was the creation of the fuel adjustment clause (FAC), essentially a single-issue rate making process, whereby a utility is permitted to implement periodic adjustments (e.g., monthly, quarterly, semi-annually, annually) associated with changes in its cost of fuel.
> . . .
> Over the ensuing years, the use of adjustment clauses has expanded greatly. Adjustment clauses are generally reserved for expenses that are outside the control of the utility or are required by law or rule.
> . . .
> **A defining characteristic of an adjustment clause is that it effectively shifts the risk associated with the recovery of the expense in question from shareholders to customers**, because if the clause operates as designed, the company is able to change its rates to recover its costs on a current basis without any negative effect on the bottom line, without the expense and delay associated with seeking recovery through the general rate case process. **[Emphasis added]**

Q. Have the rating agencies commented on the risk-reducing nature of regulatory mechanisms?

A. Yes, they have. For example, a report by Moody's Investors Service, dated June 13, 2010 and titled "Cost Recovery Provisions Key to Investor Owned Utility Ratings and Credit Quality," cited the risk-reducing nature of regulatory mechanisms. In this report, Moody's noted:

> Some regulators believe that mechanisms like automatic adjustment clauses materially reduce the business and operating risk of a utility, providing justification for a relatively low allowed return on equity. We believe this is one of several reasons why both allowed and requested ROEs have trended downward over the last two decades.
>
> **Moody's views automatic adjustment clauses**, the most common of which is for fuel and purchased power, the largest component of utility operating expenses, **as supportive of utility credit quality and important in reducing a utility's cash flow volatility, liquidity requirements, and credit risk. [Emphasis added]**

Moody's, in fact, upgraded the bulk of the entire U.S. investor-owned utility industry in early 2014, largely due to regulators' increasing use of regulatory mechanisms and the resulting improvement of utilities' finances. Moody's noted, in a February 3, 2014 Sector Comment titled "US Utility Sector Upgrades Driven by Stable and Transparent Regulatory Frameworks":

> We recently upgraded most US investor-owned utilities and many of their holding companies due to our view that the US regulatory environment has improved over the past several years. Most of the companies placed on review for upgrade in November 2013 were upgraded in late January 2014, and most by one notch.
> . . .
> **US regulated utilities appear financially secure, thanks to their suite of transparent and timely cost and investment recovery mechanisms.** When compared with other regulatory environments in developed countries, the overall regulatory environment for US utilities has steadily improved over the past few years and is expected to remain supportive and constructive for at least the next 3-5 years.
> Supportive regulatory frameworks
>
> Over the past few years, the US regulatory environment has been very supportive of utilities. We think this is partly a function of regulators acknowledging that their utility infrastructure needs a material amount of ongoing investment for maintenance, refurbishment and renovation purposes.
> . . .
> Stable and predictable financial profile
>
> **A transparent suite of timely recovery mechanisms helps utilities generate stable and predictable revenues and cash flows, which can support a material amount of leverage. [Emphasis added]**

Q. Has Moody's further commented on the impact of regulatory mechanisms and reduced risk/lower authorized ROEs for utilities?

A. Yes. In a March 10, 2015 Sector In-Depth report titled "Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles", Moody's stated:

> The credit profiles of US regulated utilities will remain intact over the next few years despite our expectation that regulators will continue to trim the sector's profitability by lowering its authorized returns on equity (ROE). **Persistently low interest rates and a comprehensive suite of cost recovery mechanisms ensure a lower business risk profile for utilities**, prompting regulators to scrutinize their profitability, which is defined as the ratio of net income to book equity. **[Emphasis added]**

Q. Has Moody's also specifically commented on PSE's regulatory mechanisms?

A. Yes, it has. As previously cited, Moody's in 2014 referred to PSE's "supportive regulatory treatment" and noted the Commission approval of a "revenue decoupling mechanism and . . . a series of predetermined annual delivery rate increases, including cost escalation factors." It is also apparent that a major reason for the Moody's upgrades of PSE's securities is the array of mechanisms in place.

Q. How should PSE's existing regulatory mechanisms be recognized in establishing the Company's cost of equity?

A. PSE's existing rate mechanisms, as described earlier, are clearly risk-reducing to the Company. As a result, I believe that PSE's cost of equity should be set at a level not greater than the mid-point of the range of cost of equity results that I have developed, which is 9.20 percent.

VI. CAPITAL STRUCTURE AND COSTS OF DEBT

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 cost of capital 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 PSE?

A. I have examined the historic (2012-2016) capital structure ratios of PSE and PE, which are shown on Exh. DCP-6. The common equity ratios (including short-term debt) have been:

	PSE Consolidated	PSE Regulatory (Year-End)	PSE Regulatory (Average Year)	PE Consolidated
2012	46.1%	48.0%	48.3%	38.7%
2013	46.5%	47.4%	48.5%	40.6%
2014	45.8%	47.7%	48.2%	39.9%
2015	46.3%	47.7%	48.2%	39.2%
2016	46.6%	47.9%	48.9%	39.7%

This indicates that PSE, on a consolidated basis (i.e., total company, without removal of non-utility equity), has had an equity ratio that has remained stable over the past five years, with about 46 percent equity (including short-term debt). The "regulatory" capital structure[19] has also been stationary, containing 48 percent or less equity on a "year-end" basis and 48.9 percent or less equity on a "monthly-average" basis. All of these reflect PSE's capital structures with common equity ratios that significantly exceed PE's levels of common equity.

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

A. Exh. DCP-7, page 1, shows the common equity ratios (including short-term debt in capitalization, as does PSE in Commission rate proceedings) for the groups of electric and combination electric utilities followed by AUS Utility Reports. These rates, which reflect consolidated period-ending figures, are:

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

[19] PSE's "regulatory" capital structures exclude the retained earnings of Puget Western; Doyle, Exh. DAD-1T at 34:23-24.

2015	48%	46%
2016[20]	46%	46%

(Source: AUS Utility Reports).

These equity ratios are similar to those of PSE.

Exh. DCP-7, page 2, shows the common equity ratios (excluding short-term debt in capitalization) for the groups of proxy electric and combination electric/gas utilities used in developing my ROE models and related conclusions. These ratios, which also reflect consolidated period-ending figures, are:

	Period	Average	Median
Parcell Proxy Group	2012-2016	51.2%	50.4%
	2020-2022	51.1%	50.8%
Morin Proxy Group	2012-2016	50.1%	49.4%
	2020-2022	49.4%	51.0%

These equity ratios are slightly higher than those of PSE; however, as noted, these averages do not include short-term debt, which this Commission considers in COC determinations.

Q. What have been the recent average common equity ratios adopted by U.S. State Regulatory Agencies in recent years?

A. Over the past several years, the average common equity ratio cited in U.S. state regulatory electric and natural gas rate proceedings have been:[21].

	Electric	Natural Gas
2012	50.69%	51.13%
2013	49.25%	50.60%
2014	50.28%	51.11%
2015	49.54%	49.93%
2016	48.91%	49.56%

[20] Mid-2016 averages.
[21] Regulatory Research Associates, "Regulatory Focus," January 18, 2017, page 5.

These are generally similar to those of PSE.[22] In addition, the average equity ratios have slightly declined over this period.

Q. What capital structure has PSE requested in the proceedings?

A. PSE proposes a capital structure comprised as follows:

	Percent
Short-Term Debt	1.0%
Long-Term Debt	50.5%
Common Equity	48.5%

This capital structure excludes the retained earnings from Puget Western.[23]

Q. How does this proposed capital structure compare to the capital structure approved in PSE's most recent rate proceedings.

A. PSE's most recently-approved capital structures contain 48.0 percent common equity. In Dockets UE-111048 and UG-111049, the capital structure with 48.0 percent long-term debt, 4.0 percent short-term debt, and 48.0 percent equity was adopted.[24] This capital structure increased the equity ratio from the 46.0 percent level previously employed, and approximated PSE's forecast capital structure using the test year.[25]

[22] These average equity ratios reflect a "blend" of capital structures, some of which include short-term debt and some do not include short-term debt.
[23] Doyle, Exh. DAD-1T at 37:9-14.
[24] Dockets UE-111048 and UG-111049, Order 08 at 21, ¶ 57.
[25] *Id.* at 20, ¶ 53.

Q. What capital structures do you propose to use in these proceedings?

A. I have used a capital structure with 48.0 percent common equity for the purposes of these proceedings. My proposed capital structure is:

Short-Term Debt	1.0%
Long-Term Debt	51.0%
Common Equity	48.0%

This capital structure maintains the 48.0 percent common equity ratio the Commission has recently employed in setting PSE's COC. It accepts the 1.0 percent level of short-term debt proposed by the Company, with the 51.0 percent long-term debt being the remainder of capital.

Q. Why are you proposing a capital structure for PSE containing 48.0 percent common equity?

A. I first note that PSE's actual consolidated capital structure as of December 31, 2016 contained 46.6 percent common equity while its regulatory capital structure contained 47.9 percent equity on a year-end basis, as shown on Exh. DCP-6. Of the four sets of capital structure ratios shown on Exh. DCP-6, only one (i.e., the regulatory capital structure on an average basis) contains an equity ratio of over 48.0 percent. Thus, my proposed capital structure is similar to most of the recent actual capital structure ratios of PSE and PE.

Second, it is apparent that PSE's actual equity ratios have not materially increased from the time period of its last rate proceeding (i.e., 2012) when the 48.0 percent common equity ratios was established.

Third, the equity ratios of PE, which contain levels of debt financing the leveraged buy-out, are well below those of PSE.

Fourth, this capital structure matches the capital structure adopted by the Commission in PSE's last rate proceeding.[26]

Fifth, the proposed capital structure is similar to that of other electric and combination electric utilities, as shown on Exh. DCP-7.

Sixth, since the 48.0 percent equity ratio was first adopted for the Company, its ratings have been upgraded by Moody's and the Commission has approved revenue decoupling for both electric and gas operations.

Seventh, the "weighted cost of debt" reflecting the continuation of a 48.0 percent equity ratio and a declining cost of long-term debt, has declined since the 48.0 percent equity ratio was accepted by the Commission.

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). 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.[27]

[26] Dockets UE-111048 and UG-111049.
[27] *Wash. Utils. & Transp. Comm'n v. Puget Sound Energy, Inc.*, Dockets UE-040640 and UG-040641, Order 06, 13, ¶ 27 (February 18, 2005).

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

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

Q. Are there any additional factors which are relevant to the determination of PSE's equity ratio?

A. Yes, there are. First, as noted by PSE witness Lohse, the Company's cost of long-term debt has declined in recent years.[28] As is shown on his Figure 1, PSE's cost of long-term debt was 6.34 percent in 2011 (last PSE rate proceeding in which capital structure was litigated), 6.13 percent in 2013 (last PSE rate proceeding, which was an expedited rate proceeding), and is 5.73 percent in its current rate request. As the table below shows, this declining cost of long-term debt has the effect of reducing the weighted cost of PSE's debt:

Year	Equity Ratio	Debt Cost	Wgt. Debt Cost
2011	48.0%	6.34%	3.04%
2013	48.0%	6.13%	2.94%
Current	48.0%	5.73%	2.75%

This demonstrates that a constant 48.0 percent common equity ratio, combined with a declining cost of debt, results in a declining weighted cost of debt. Under those circumstances, it is apparent that even a lower than 48.0 percent equity ratio would be consistent with the weighted cost of debt in 2011, when the 48.0 percent level was established. In any event, there is no need to increase PSE's equity ratio.

[28] Lohse, Exh. BJL-1T at 11, Figure 1.

Second, in the 2011 PSE proceeding, the Company maintained that its requested 48.0 percent equity ratio was "consistent with the Company's targeted capital structure that will likely support utility operations during the rate year."[29] However, as my Exh. DCP-6, page 1, indicates, PSE has had an actual "regulatory" common equity ratio of 48.0 percent or less each year since 2012, as expressed on a year-end basis. As a result, the 48.0 percent equity ratio currently incorporated in rates has exceeded the actual equity ratios maintained by PSE.

Q. PSE Witness Doyle maintains that the Company's requested 48.5 percent equity is "a reasonable level of equity to attract debt investment at a reasonable cost."[30] Is this a reason to increase PSE's equity ratio?

A. No, it is not. As noted elsewhere in my testimony, PSE's cost of debt has declined in recent years, notwithstanding a 48.0 percent equity ratio embedded in its rates. As a result, it is also apparent that the existing 48.0 percent equity ratios is "a reasonable level of equity to attract debt investments at a reasonable cost." In addition, as noted in my testimony, PSE credit ratings have actually improved in recent years, notwithstanding its 48.0 percent equity ratio.

[29] Dockets UE-111048 and UG-111049, Order 08 at 15 and 19-20, ¶¶ 42 and 53.
[30] Doyle, Exh. DAD-1T at 35:5-9.

Q. What are the cost rates of debt in PSE's applications?

A. PSE proposes the respective costs of short-term (3.06 percent) and long-term debt (5.73 percent), which are its estimated cost rates for the Rate Year ending December 31, 2018. I also use these rates in my COC analyses.

Q. Can the ROE be determined with the same degree of precision as the costs 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 PSE?

A. PSE is not a publicly-traded company, nor is its parent PE. Consequently, it is not possible to directly apply ROE models to PSE or PE. However, in COC analyses, it is customary to analyze groups of comparison, or "proxy," companies as a substitute for PSE to determine its ROE.

I have accordingly selected two groups for comparison to PSE. I selected one group of electric utilities similar to PSE using the criteria listed on Exh. DCP-8. These criteria area as follows:

(1) Market cap of $1 billion to $15 billion;

(2) Common equity ratio 40% or greater;

(3) Value Line Safety rank of 1, 2, or 3;

(4) Standard & Poor's ("S&P") stock ranking of A or B;

(5) S&P and/or Moody's bond ratings of BBB or A;

(6) Currently pays dividends; and

(7) Not involved in major merger or acquisition.

In addition, I have conducted studies of the cost of equity for the proxy group that was selected by PSE witness Dr. Roger A. Morin.

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 cost of equity analyses on the utility witness's proxy group. My conclusions and recommendations, in turn, are based upon the results of both proxy groups.

VIII. DISCOUNTED CASH FLOW (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.[31]

[31] Certain regulatory commissions (e.g., Federal Energy Regulatory Commission) rely primarily on the DCF methodology in determining 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). I use a version of the 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 (March - May 2017). 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 2012-2016 (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 2017, 2018 and 2020-2022 projections of earnings retention growth (per Value Line);
4. Years 2014-2016 to 2020-2022 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. Exh. 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[32]	Mean High[33]	Median Low[32]	Median High[33]
Parcell Proxy Group	7.9%	7.6%	6.8%	9.0%	6.8%	8.9%
Morin Proxy Group	8.0%	7.8%	7.1%	8.7%	7.1%	8.9%

I note that the individual DCF calculations shown on Exh. 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 6.8 percent and 9.0 percent. The highest DCF rates are 8.7 percent to 9.0 percent.

I believe a range of 8.7 percent to 9.0 percent (8.85 percent mid-point) represents the current DCF-derived ROE for the proxy groups. This range includes the highest DCF rates and exceeds the low and mean/median DCF rates.

Q. Why do you focus on the highest DCF rates in your recommendations?

A. I have focused on the highest DCF results in order to be conservative. Recent and current average DCF results are relatively low, from a historical perspective. As a result, I give little weight to the average/median results. By focusing on the highest DCF results, I am giving recognition to this perspective, and thus, my DCF recommendation is somewhat higher.

[32] Using the lowest growth rate.
[33] Using only the highest growth rate.

IX. CAPITAL ASSET PRICING MODEL (CAPM) ANALYSIS

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

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 most recent three-month average yield (March - May 2017) 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 2.73 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 1.0 are considered less risky than the market, whereas betas greater than 1 are more risky. Utility stocks traditionally have had betas below 1.0. I utilize the most recent Value Line betas for each company in the proxy groups.

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., same timeframe as employed in Duff & Phelps source used to develop risk premiums).

First, I compared the actual annual returns on equity of the S&P 500 with the actual annual income returns of U.S. Treasury bonds. Exh. DCP-10 shows the ROE for the S&P 500 group for the period 1978-2016 (all available years reported by S&P). This exhibit also indicates the annual income returns 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 7.0 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 Duff & Phelps (formerly published by Morningstar/Ibbotson), using both arithmetic and geometric means. I considered the total returns for the entire 1926-2016 period reported by this source, which are as follows:

	S&P 500	L-T Gov't Bonds	Risk Premium
Arithmetic	12.0%	6.0%	6.0%
Geometric	10.0%	5.5%	4.5%

I conclude from this analysis that the expected risk premium is about 5.8 percent (i.e., the average of all three risk premiums: 7.0 percent from Exh. DCP-10; 6.0 percent arithmetic and 4.5 percent geometric from Duff & Phelps). I believe that a combination of arithmetic and geometric means is appropriate since investors have access to both

types of means[34] and presumably, both types are reflected in investment decisions and thus, stock prices and the ROE.

Q. What are your CAPM results?

A. Exh. DCP-11 shows my CAPM calculations. The results are:

	Mean	Median
Parcell Proxy Group	7.0%	6.8%
Morin Proxy Group	6.6%	6.5%

Q. What is your conclusion concerning the CAPM ROE?

A. The CAPM results collectively indicate a ROE of 6.5 percent to 7.0 percent for the groups of proxy utilities. I conclude that an appropriate CAPM ROE estimation for PSE is 6.5 percent to 7.0 percent.

X. COMPARABLE EARNINGS (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

[34] For example, Value Line uses compound (i.e., geometric) growth rates in its historic and projected per share growth rates. In addition, mutual funds report growth rates on a compound basis.

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 PSE's ROE?

A. I apply the CE methodology by examining realized ROEs for the groups of proxy utilities, as well as unregulated companies, and evaluating investor acceptance of these returns by reference to the resulting market-to-book ratios ("M/Bs"). 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) reflects 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 2002-2016 (i.e., the last fifteen 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: 2009-2016 (the current business cycle) and 2002-2008 (the most recent business cycle). I have also considered projected ROEs for 2017, 2018 and 2020-2022.

Q. Please describe your CE analysis.

A. Exh. DCP-12 and Exh. DCP-13 contain summaries of experienced ROEs and M/Bs for three groups of companies, while Exh. DCP-14 presents a risk comparison of utilities versus unregulated firms.

Exh. DCP-12 shows the ROEs and M/Bs for the groups of proxy utilities. These can be summarized as follows:

	Parcell Proxy Group	Morin Proxy Group
Historic ROE		
Mean	9.1-9.2%	10.5-11.3%
Median	9.3-9.5%	10.3-10.7%

Historic M/B		
Mean	145-148%	162-165%
Median	143-150%	155-157%
Prospective ROE		
Mean	9.4-10.0%	10.5-11.3%
Median	9.3-9.5%	10.3-10.8%

These results indicate that historic ROEs of 9.1 percent to 11.3 percent have been adequate to produce M/Bs of 143 percent to 165 percent for the groups of utilities. Furthermore, projected returns on equity for 2017, 2018 and 2020-2022 are within a range of 9.3 percent to 11.3 percent for the utility groups. These relate to 2016 M/Bs of 170 percent or greater. The information in this exhibit also indicates that the utility group with the highest ROEs (i.e., Morin proxy group) also has the highest levels of M/Bs.

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. Exh. DCP-13 presents the earned ROEs and M/Bs for the S&P 500 group over the past fifteen years (i.e., 2002-2016). As this schedule indicates, over the two business cycle periods, this group's average ROEs ranged from 12.4 percent to 13.3 percent, with average M/Bs ranging between 233 percent and 275 percent.

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

A. The recent ROEs of the proxy utilities and S&P 500 group 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 utilities and the competitive companies. I do this in Exh. DCP-14, which compares several risk indicators for the S&P 500 group and the utility groups. The information in this exhibit indicates that the S&P 500 group is more risky than the utility proxy groups.

Q. What ROE is indicated by your CE analysis?

A. Based on recent 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). For my proxy group, recent ROEs of 9.1 percent to 9.5 percent have resulted in M/Bs of 143 percent and over. Prospective ROEs of 9.3 percent to 10.0 percent have been accompanied by M/Bs over 170 percent.[35] 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 exceed 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 most of the actual and prospective ROEs for my proxy group. I have thus made no downward ROE adjustments to these return levels to reflect the high M/Bs.

[35] Recent ROEs, as well as M/Bs, of Dr. Morin's proxy group are both higher.

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	8.85%	8.7-9.0%
CAPM	6.75%	6.5-7.0%
CE	9.50%	9.0-10.0%

These results indicate an overall broad range of 6.5 percent to 10.0 percent, which focuses on the respective individual model results. Using mid-point values, the range is 6.75 percent to 9.5 percent. I recommend a ROE range of 8.85 percent to 9.5 percent for PSE (approximate mid-point of 9.20 percent). This range includes the mid-point of my DCF results and the mid-point of my CE results. My specific ROE recommendation is 9.20 percent.

Q. It appears that your CAPM results are less than your DCF and CE results. Does this imply that the CAPM results should not be considered in determining the cost of equity for PSE?

A. No. It is apparent that the CAPM results are 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 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 six-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 PSE. For example, the lower CAPM results are further justification for a reduction in PSE's ROE.

XII. TOTAL COST OF CAPITAL

Q. What is the total COC for PSE?

A. Exh. DCP-3 reflects the total COC for PSE using my proposed capital structure and embedded costs of debt, as well as my ROE recommendations. The resulting COC is a range of 7.20 percent to 7.51 percent. With my 9.20 percent ROE, my COC recommendation is 7.37 percent.

XIII. COMMENTS ON COMPANY TESTIMONY

Q. What ROE is PSE requesting in this proceeding?

A. PSE is requesting a 9.8 percent ROE. This 9.8 percent ROE is recommended by PSE witness Dr. Roger A. Morin. Dr. Morin's ROE estimates are summarized below:[36]

[36] Morin, Exh. RAM-1T at 55:14.

Study	ROE
DCF-Electric Utilities Value Line Growth	9.8%
DCF – Electric Utilities Analysts Growth	9.4%
Traditional CAPM	9.3%
Empirical CAPM	9.8%
Historical Risk Premium Electric	10.5%
Allowed Risk Premium	10.7%
Average	**9.9%**
Median	**9.8%**
Truncated Mean	**9.9%**

Q. Do you have any disagreements with Dr. Morin's ROE conclusions?

A. Yes, I do. Each of his ROE methodologies over-states, to some degree, the required ROE for PSE. In addition, Dr. Morin cites PSE's "very small revenue and asset bases" as a "reason for considering the ROE . . . requested by PSE to be 'barebones'".[37] I disagree with his use of a "size adjustment" for evaluating PSE's ROE.

Q. What is your understanding of Dr. Morin's DCF analyses?

A. Dr. Morin performs two sets of DCF analyses for his proxy group of electric utilities, using data as of November 2016.[38] In these analyses, he uses "spot" dividend yields for each company. For the growth rates, he used two indicators of growth – 5-year EPS growth projections and Value Line projections of EPS growth.

The major problem with Dr. Morin's DCF analyses is the fact that he has used only one indicator of growth – projections of EPS growth. As I indicated in my DCF analysis, it is customary and proper to use alternative measures of growth.

Dr. Morin's DCF analyses implicitly assume that investors rely exclusively on EPS projections in making investment decisions. This is a very dubious assumption and

[37] Morin, Exh. RAM-1T at 57:11-13.
[38] Morin, Exhs. RAM-5 and RAM-6.

Dr. Morin has offered no evidence that it is correct. I note, for example, that Value Line – one of the sources of his growth rate estimates – contains many statistics, both of a historic and projected nature, for the benefit of investors who subscribe to this publication and presumably make investment decisions based at least in part from the information contained in Value Line. Yet, Dr. Morin would have us believe that Value Line subscribers and investors focus exclusively on one single number from this publication.

I note in this regard that the DCF model is a "cash flow" model. The cash flow to investors in a DCF framework is dividends. Dr. Morin's DCF model, in contrast, does not even consider dividend growth rates.

Q. What is your understanding of Dr. Morin's CAPM analyses?

A. Dr. Morin performs CAPM analyses for his proxy group of electric utilities (0.70 average beta). He combines this 0.70 beta with a 4.4 percent "forecast" cost of long-term (30-year) U.S. Treasury bonds and a 7.0 percent risk premium to get the following CAPM results (page 45):

$$K = RF + \beta(RP) = 4.4\% + 0.70(7.0\%) = 9.3\%$$

Q. Do you agree with this CAPM analysis?

A. No, I do not.

Q. With which components of his CAPM analysis do you disagree?

A. I disagree with the use of forecasted interest rates and the risk premium component.

Q. Why is it not proper to use projected interest rates as the risk-free rate?

A. It is proper to use the current (i.e., actual) yield as the risk-free rate in a CAPM context. This is the case since the current yield is known and measurable and reflects investors' collective assessment of all known capital market conditions. Prospective interest rates, in contrast, are not measurable and not achievable. For example, if the current yield on 20-year U.S. Treasury Bonds is about 2.75 percent, this reflects the rate that investors can actually receive on their investment. Investors cannot receive a prospective yield on their investments since such a yield is not actual but rather speculative.

Use of the current risk-free rate in a CAPM context is similar to using the current yield in a DCF context. Analysts do not use prospective stock prices as the basis for the dividend yield in a DCF analysis, as use of prospective stock prices is speculative. Use of current stock prices is appropriate, as are used by Dr. Morin. Likewise, current levels of interest rates reflect all current information (i.e., the efficient market hypothesis) and should be used as the risk-free rate in the CAPM. In addition, actual yields, not projected yields, are used by Dr. Morin in the development of his proposed risk premium.

Q. What is your disagreement with Dr. Morin's market risk premium component?

A. Dr. Morin's 7.0 percent risk premium is partially derived from the 1926-2015 Duff & Phelps (formerly Morningstar/Ibbotson) study (cited previously) showing a 7.0 percent differential between common stocks and the "income component" of U.S. Treasury bonds.[39]

[39] Morin, Exh. RAM-1T at 39:5-11.

I disagree with this study since Dr. Morin improperly used "income returns" from the Duff & Phelps study rather than "total returns." What Dr. Morin did was compare the differential between total returns for common stocks (i.e., dividends and capital gains) and only income returns for Treasury bonds. As such, he has ignored the capital gains component of the Treasury bonds return. As I indicated in my earlier testimony, the differential between total returns of common stocks and Treasury bonds is 6.0 percent (a figure Dr. Morin acknowledges on page 39). In addition, Dr. Morin's use of the Duff & Phelps study only used half of the reported data (arithmetic means) and ignored the other half of the reported data (geometric means). I discussed this issue earlier in my testimony.

Q. Please describe Dr. Morin's "empirical" CAPM analysis.

A. Dr. Morin also employs what he describes as an "empirical" CAPM analysis. This form of the CAPM assumes that beta for an industry understates the industry's volatility; therefore, risk is understated. As a result, it is necessary to substitute the overall market's beta (i.e., 1.0) for one-fourth of the industry's actual beta. Dr. Morin assumes that the appropriate beta in a CAPM analysis is a combination of the actual industry beta with a 75 percent weight and a beta of 1 with a 25 percent weight.

The use of an empirical CAPM overstates the cost of equity for companies with betas below that of the market. What the empirical CAPM actually does is inflate the CAPM cost for the selected company or industry on one-fourth of its equity and assumes that one-fourth of the company has the risk of the overall market. This essentially creates

a hypothetical beta and CAPM result which is not appropriate for PSE or for other utilities.

Q. Please describe your understanding of Dr. Morin's risk premium analyses.

A. Dr. Morin performs two sets of risk premium analyses which involve the estimation of an equity risk premium over the forecasted (as of late 2016) 4.4 percent long-term government bond yield developed in his CAPM analyses.

Q. Please describe Dr. Morin's historic risk premium for the electric utility industry.

A. Dr. Morin's historic risk premium for the electric utility industry involves an examination of the total returns of long-term government bonds (capital gains/losses plus interest) and the S&P Electric Utilities Index (capital gains/losses plus dividend yield) over the period 1931-2015. The average historical difference between the electric utility returns and the utility bond income returns was 6.1 percent. His historic risk premium for the electric utility industry simply added the 4.4 percent forecast long-term government bond yield to the 6.1 percent historic risk premium to get a 10.5 percent result.[40]

Q. Do you agree with this methodology for estimating the cost of equity for PSE?

A. No, I do not. Dr. Morin's historic risk premium of 6.1 percent is simply an examination of historical events going back to 1931. He has made no demonstration that economic and financial conditions in 2017 are similar to those over the past seventy-five years. The

[40] Morin, Exh. RAM-1T at 50:14-16.

use of such a methodology implicitly assumes that the events of each of these years can have the same influences at the current time.

In addition, the risk premiums developed by Dr. Morin are generally dominated by the influence of capital gains in many years. I do not believe it is proper to assign PSE's cost of equity based directly upon a methodology which is dominated by stock market changes and bond market changes.

Finally, Dr. Morin uses forecasted interest rates. As I indicated previously, this is improper.

Q. Please describe Dr. Morin's analysis of allowed risk premiums for the electric utility industry.

A. In this phase of his risk premium testimony, Dr. Morin compares the differential between allowed returns on equity for electric utilities and long-term Treasury bonds over the 1986-2015 period. The average spread over this period was 5.6 percent, but Dr. Morin does not utilize this differential as his risk premium. Instead, he performs regression analyses to track the risk premium in terms of rising and falling interest rates. He then concludes that a 6.3 percent risk premium is appropriate in conjunction with a 4.4 percent Treasury bond yield.[41] This adjustment is not consistent with Dr. Morin's historic risk premium analyses where he simply took the average risk premium over the entire 1931-2015 period and applied it to the projected level of Treasury bond yields.

I also note that there has been a downward trend in allowed returns on equity for electric and natural gas utilities in recent years. According to the source of Dr. Morin's

[41] Morin, Exh. RAM-1T at 53:6-7.

allowed risk premium analysis, (Regulatory Focus, published by Regulatory Research Associates, as cited earlier in my testimony), the annual average return on equity awards[42] have been:

Year	Electric	Natural Gas
2006	10.34%	10.40%
2007	10.31%	10.22%
2008	10.37%	10.39%
2009	10.52%	10.22%
2010	10.29%	10.15%
2011	10.19%	9.91%
2012	10.01%	9.93%
2013	9.81%	9.68%
2014	9.75%	9.78%
2015	9.60%	9.60%
2016	9.60%	9.49%

It is noteworthy that the average authorized return on equity has not been as large as Dr. Morin's 9.8 percent return on equity recommendation since 2013.

Q. It is proper to compare the size of PSE to the proxy electric utility companies and make risk comparisons based upon the size differentials between them?

A. No, it is not proper. Many of the proxy utilities have multiple subsidiaries that operate in different jurisdictions. Following Dr. Morin's reasoning, each of the subsidiaries of the proxy companies should be considered as more risky than the proxy group since, by definition, they would have to be smaller. This reasoning is flawed, since these individual electric utility subsidiaries do not raise their equity capital directly from investors, but rather do so as a consolidated entity.

[42] General Rate Cases.

Q. Can you provide any evidence that "size" adjustments are not generally recognized as risk factors in regulatory proceedings such as this one?

A. Yes, I can. The table below reflects the average size (as measured by net plant) and current authorized returns on equity or various types of regulated utilities:

Industry	Average Net Plant (000)	Average Authorized ROE[43]
Electric	$20,235	10.33%
Combination Electric-Gas	$20,564	10.24%
Natural Gas	$2,918	9.49%
Water	$2,760	9.65%

Source: AUS Utility Reports, September 2016.

As this indicates, water and natural gas utilities are the smallest type of utility, yet they have the lowest average authorized returns on equity. This is indicative that size, per se, should not govern the level of return on equity.

In addition, my Exh. DCP-15 demonstrates that size is not a factor in assessing risk. As this schedule shows, there is no significant difference, and even more to the point that there is no discernible pattern of increase, among the risk indicators of publicly-traded electric utilities of different sizes. The table below summarizes the information contained in this schedule:

Cap Size	Safety	Beta	Financial Strength	S&P Rank	S&P Rating	Moody's Rating
Under $3 B	2.3	.73	B++	A-/B+	BBB+/BBB	A3/Baa1
$3-$5 B	2.0	.76	A	A-/B+	BBB	Baa1
$5-$10 B	2.0	.74	A/B++	A-/B+	BBB+	Baa1/Baa2
$10-$15 B	2.7	.70	B++/B+	B	BBB+	Baa1/Baa2
$15-$25 B	1.3	.61	A	A-	A-	Baa1
$25 B Plus	2.1	.66	BBB+	B+	BBB+	Baa1/Baa2

[43] Authorized ROEs reflect currently-authorized levels, which may not be recently-determined.

The safety rank, beta values, financial strength and S&P stock ranking are about the same for all sizes of electric utilities. These risk indicators do not reflect any risk differential as the size of the electric utilities moves from small to large. To the contrary, this data indicates that regulated monopoly utility providers have approximately the same risk regardless of size.

Q. Does this conclude your testimony?

A. Yes, it does.