Exh. DCP-1T
Dockets UE-190529/UG-190530 and
UE-190274/UG-190275 (*consolidated*)
Witness: David C. Parcell

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**DOCKETS UE-190529 and UG-190530 *(consolidated)***
In the Matter of the Petition of **PUGET SOUND ENERGY** **For an Order Authorizing Deferral Accounting and Ratemaking Treatment for Short-life UT/Technology Investment**	**DOCKETS UE-190274 and UG-190275 (*consolidated*)**

TESTIMONY OF

David C. Parcell

ON BEHALF OF STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION

Cost of Capital

November 22, 2019

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I. INTRODUCTION

Q. Please state your name, and address.

A. My name is David C. Parcell. My address is 2218 Worchester Rd., Midlothian, VA 23113.

Q. By whom are you employed and in what capacity?

A. I am a Principal and Senior Economist of Technical Associates, Inc.

Q. Please state your qualifications to provide testimony in this proceeding

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 575 utility proceedings before about 50 regulatory agencies in the United States and Canada.

Q. Have you testified previously before the Commission?

A. Yes. I have previously filed testimony on behalf of the Staff of the Washington Utilities and Transportation Commission (Commission) in several proceedings involving Avista Corp., Cascade Natural Gas, and Pacific Power & Light Company,

as well as Puget Sound Energy, Inc. ("PSE"). 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 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	2.3%	5.65%		0.13%	
Long-Term Debt	49.2%	5.57%		2.74%	
Common Equity	48.5%	8.9% 9.2% 9.5%	4.32%	4.46%	4.61%
Total	100.0%		7.19%		7.48%
				7.33%	

PSE's application requests a COC of 7.62 percent and a cost of equity ("ROE") of 9.80 percent.

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. PSE has traditionally used its corporate structure to establish rates in Washington. In addition, it has not distinguished between its electric and natural gas operations from a cost of capital perspective. I have followed this tradition in my analyses and thus focus on PSE's capitalization and a single COC 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 and 51.5 percent debt.[1] I note that a similar capital structure was approved in its last rate proceedings of PSE, where the Commission adopted a capital structure with 48.5 percent common equity and 51.5 percent debt.[2] I use the 48.5 percent common equity ratio from previously-adopted capital structure, which I believe remains the proper capital structure for the Company. I also include the short-term debt and long-term ratios, as proposed by PSE, in the capital structure.

[1] Doyle, Exh. DAD-1T at 24:4-7.
[2] *Wash. Utils. & Transp. Comm'n v. Puget Sound Energy*, Dockets UE-170033 & UG-170034, Order 08, 28, ¶ 83, Table 3A; 34, ¶ 94 (Dec. 5, 2017) (2017 PSE GRC Order).

The second step in a cost of capital calculation is to determine the embedded cost rates of debt. PSE proposes use of a 5.65 percent cost of short-term and 5.57 percent cost of long-term debt, which is an estimated cost rate as of March 31, 2021.[3] These costs of short-term and long-term debt are not shown in the Company's application, as the commitment fees and amortization of debt costs are not factored in the stated cost rates. As shown on Exh. DCP-3, I have derived the costs of short-term and long-term debt from the information contained in Exh. MDM-5, page 1.

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:

Methodology	Range
Discounted Cash Flow ("DCF")	7.8%-8.9% (8.35% mid-point)
Capital Asset Pricing Model ("CAPM")	5.5%-5.6% (5.55% mid-point)
Comparable Earnings ("CE")	9.0%-10.0% (9.5% mid-point)

Based upon these findings, I conclude that PSE's ROE is within a range of 8.9 percent to 9.5 percent, which is based upon the upper end of the range of the results for the DCF model and mid-point of the range of results for the CE model. I specifically recommend a 9.2 percent ROE for PSE. I note that I do not give the results of my CAPM weight in my final recommendation, since these are low relative to the other model results and can be considered anomalous.

[3] Parcell, Exh. DCP-3 at 2; McArthur, Exh. MDM-5 at 1.

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 form 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 *ex post* (after the fact) earned return on an asset base, while the cost of capital 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 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, which 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."[4]

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 impacted 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 that 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

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

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: The National Bureau of Economic Research, "U.S. 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 enjoyed general prosperity and stability. This period was 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

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

increase in petroleum prices and a dramatic decline in the U.S. financial sector of the economy.

This decline has been described as the worst financial crisis since the Great Depression of the 1930s and has been referred to as the "Great Recession." Beginning in 2008, the U.S. and other governments implemented unprecedented policies to attempt to correct or minimize the scope and effects of this recession. Some of these policies are still in effect.

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 reduction is evidenced by a decline in both short-term and long-term interest rates and in the expectations of investors. The cost of capital model results (such as DCF, CAPM, and CE) reflect this reduction as well. 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.[6]

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

[6] S&P, Regulatory Research Associates (RRA), "Regulatory Focus", April 11, 2019.

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, as well as a much deeper, recession. Since then, economic growth has been somewhat erratic, and the economy has grown more slowly 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 on an annual basis, with 2014 and 2015 growth below 1 percent, 2016 and 2017 growth at 2.1 percent, and 2018 growth at 1.9 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.[7]

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

A. Exh. DCP-4 page 2, shows several series of interest rates. Both short-term and long-term rates rose sharply to record levels in 1975-1982 when the inflation rate was high. Interest rates have declined substantially in conjunction with the corresponding declines in inflation since the early 1980s.

[7] 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.

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. Following much anticipation, the Federal Reserve subsequently raised the Federal Funds rate on nine occasions between December of 2015 and December of 2018.[8] Most recently, the Federal Reserve again lowered the Federal Funds rate in July, September and October of 2019. The Federal Reserve also purchased U.S. Treasury securities to stimulate the economy.[9]

As seen on Exh. DCP-4 page 2, since 2011 both U.S. and public utility bond yields have 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 (prior to the most recent lowerings of the rate), interest rates have remained relatively low. The rates on U.S. Treasury and public utility securities increased somewhat in the first several months of 2018, before falling over the past several months. Both government and utility long-term lending rates remain near historically low levels, again reflective of lower capital costs.

[8] The Fed Funds increases took place in December 2015, December 2016, March 2017, June 2017, December 2017, March 2018, June 2018, September 2018, and December 2018. The declines took place in July 2019, September 2019, and October 2019.

[9] 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 Exh. DCP-4 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, including much of 2018. As an example of this, the end of 2018 witnessed significant declines in stock prices, with many indexes declining more than 20 percent (i.e., a "bear" market). Since the beginning of 2019, stocks have risen with many of the indices reaching record levels.

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. Concurrent with the Great Recession, 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 even with the return of

stock prices to levels achieved prior to the "crash."[10] This is evidenced by: (1) lower interest rates on bank deposits; (2) lower interest rates on U.S. Treasury and utility bonds; and (3) lower authorized returns on equity by regulatory commissions. Finally, as noted above, utility bond interest rates are currently at levels well below those prevailing prior to the financial crisis of late 2008 to early 2009 and remain near the lowest levels in the past 35 years and are also generally lower than the embedded cost rates for most utilities, including PSE.

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. The current interest costs (e.g., the most recent yield on triple-B utility bonds is 3.72 percent, as shown on Exh. DCP-4 page 2) that utilities (including PSE) pay on new debt remain near the low point of the last several decades and are lower than existing embedded cost rates.

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 remain relatively low through 2019, as follows:[11]

[10] *See, e.g.*, Vanguard News & Perspectives, "Stabilization, Not Stagnation: Expect Modest Returns", March 30, 2017, *available at* www.personal.vanguard.com/us/insights/artical/infographic-stabilization-032017.
[11] S&P, RRA, "Regulatory Focus", April 11, 2019, General Rate Cases, for electric and gas utilities.

	Electric		Natural Gas	
	Average	Median	Average	Median
2007	10.32%	10.23%	10.22%	10.20%
2008	10.37%	10.30%	10.39%	10.45%
2009	10.52%	10.50%	10.22%	10.26%
2010	10.29%	10.26%	10.15%	10.10%
2011	10.19%	10.14%	9.91%	10.05%
2012	10.02%	10.00%	9.93%	10.00%
2013	9.82%	9.82%	9.68%	9.72%
2014	9.76%	9.75%	9.78%	9.78%
2015	9.60%	9.53%	9.60%	9.68%
2016	9.60%	9.60%	9.53%	9.50%
2017	9.68%	9.60%	9.73%	9.60%
2018	9.56%	9.57%	9.59%	9.60%
2019 (1Q)		9.57%		9.55%

Q. The table above appears to indicate that the average and median authorized ROEs for electric utilities in recent years, which may appear to indicate that the decline in ROEs has moderated. Is this a proper assessment of the trend in ROEs?

A. No, this does not tell the whole story of the trend in authorized ROEs. Another relevant consideration is how the recently-authorized ROEs compare to the previously-authorized ROE for the various utilities that have had rate decisions in recent years. On average, general rate cases decided in 2017 and 2018 resulted in lower authorized ROE compared with all rate cases decided between 2012 and 2018. I have shown this comparison on Exh. DCP-5, which reflects the electric utility proceedings in 2017 and 2018 where an authorized ROE was identified. This exhibit also identifies the previously-authorized ROE if it was determined in 2012 or after. As this exhibit indicates, there were 64 proceedings that meet these criteria. Of these 64, only nine reflected an increased ROE in 2017 or 2018, 14 reflected no change in

ROE, and 41 reflected a decrease in the ROE. Clearly, the vast majority of authorized ROEs represented a decline from the previously authorized ROE over this period. Furthermore, the average ROE declined by 0.22 percent and the median ROE declined by 0.20 percent.

V. PUGET SOUND ENERGY'S OPERATIONS AND BUSINESS RISKS

Q. Please summarize 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 840,000 customers in the Puget Sound region of Western Washington.[12]

Q. Please describe PSE's ownership structure.

A. PSE is a subsidiary of Puget Energy, Inc. ("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 the group of private investors[13] in a leveraged private equity buyout. PE is now a Washington-based holding company whose operations are conducted through PSE.

[12] *Available at* https://www.pse.com/about-us.

[13] Puget Holdings is currently owned by the following entities: Alberta Investment Management Corp., British Columbia Investment Co., Canada Pension Plan Investment Board, Ontario Municipal Employees Retirement System, and PGGM. *In re Joint Application for an Order Authorizing Proposed Sales of Indirect Interests in Puget Sound Energy*, Docket U-180680, Order 06, 3, ¶ 5 (March 7, 2019).

Q. What are the current security ratings of PSE?

A. The present debt ratings of PSE's debt are shown on Exh. DCP-6 and are as follows:

	Secured	Corp./Issuer
Moody's	A2	Baa1
Standard & Poor's	A-	BBB

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

A. This is also shown on Exh. DCP-6. As this indicates, PSE's current ratings by Standard & Poor's and Moody's have remained the same throughout the period 2014 to the present.

Q. How do the bond ratings of PSE compare to other electric and combination gas/electric utilities?

A. PSE's ratings are generally similar to most electric utilities in the U.S. This is evidenced by the relative Moody's and Standard & Poor's debt ratings, as shown on my Exh. DCP-9 and which indicates that PSE's ratings are generally similar to those of the two groups of proxy electric utilities used to develop the ROE recommendations in my testimony.

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 (2014-2018) capital structure ratios of PSE and PE, which are shown on Exh. DCP-7. The respective common equity ratios have been:

	PSE Regulated Utility		PSE Consolidated		PE	
	Including S-T Debt	Excluding S-T Debt	Including S-T Debt	Excluding S-T Debt	Including S-T Debt	Excluding S-T Debt
2014	48.2%	48.5%	45.8%	47.7%	39.6%	40.3.%
2015	48.2%	48.5%	46.3%	47.3%	39.0%	39.7%
2016	48.9%	49.4%	46.6%	48.2%	39.7%	40.8%
2017	49.8%	50.3%	46.9%	49.0%	39.3%	40.7%
2018	49.0%	50.6%	46.5%	48.8%	38.9%	40.5%

This indicates that PSE and PE have had equity ratios that have generally been stable over the past five years.

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

A. Exh. DCP-8 shows the common equity ratios (excluding short-term debt in capitalization) for the groups of proxy electric utilities used in developing my cost of equity models and related conclusions. These are:

	Period	Average	Median
Parcell Proxy Group	2014-2018	53.2%	54.9%
	2022-2024	52.5%	52.0%
Morin Proxy Group	2014-2018	47.6%	48.5%
	2022-2024	48.1%	47.3%

The equity ratios for my proxy group are slightly higher than those of PSE Utilities (excluding short-term debt), whereas the equity ratios of the Morin group are similar to those of PSE Utilities

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

A. Over the past several years, the average common equity ratios cited in U.S. state regulatory electric and gas rate proceedings have been:[14]

	Electric	Gas
2012	50.69%	51.13%
2013	49.25%	50.60%
2014	50.28%	51.11%
2015	49.54%	49.93%
2016	48.91%	50.06%
2017	48.90%	49.88%
2018	48.95%	50.09%

These are similar to those of PSE's common equity ratios. It is noteworthy, on the other hand, that these equity ratios reflect a combination of approved capital structures, some of which include short-term debt and some of which exclude short-term debt.

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

A. PSE proposes a capital structure comprised as follows:

	Percent
Short-Term Debt	2.3%
Long-Term Debt	49.2%
Common Equity	48.5%

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

A. It reflects no change in PSE's equity ratio, which remains at 48.5 percent. In Dockets UE-170033/UG-170034, the parties stipulated to a capital structure with 51.5 percent debt/48.5 percent equity.

[14] S&P, RRA, "Regulatory Focus", January 31, 2019.

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

A. I have also used a capital structure with 48.5 percent and the inclusion of short-term debt for the purposes of these proceedings. My proposed capital structure is derived in Exh. DCP-3 and is as follows:

Short-Term Debt	2.3%
Long-Term Debt	49.2%
Common Equity	48.5%

Q. Why are you proposing a capital structure for PSE containing 48.5 percent common equity?

A. I first note that PSE's actual capital structure as of December 31, 2018 contained 49.0 percent common equity, as shown on Exh. DCP-7 page 1. Thus, my proposed capital structure is similar to the recent actual capital structure ratio of PSE (on a regulated utility basis).

Second, Exh. DCP-7 shows the actual equity ratios of PSE and PE have not increased in recent years.

Third, this capital structure matches the capital structure stipulated to by the parties and adopted by the Commission in PSE's prior rate proceeding.[15]

Fourth, the proposed capital structure is similar to that of other electric and combination electric utilities, as shown on Exh. DCP-8.

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

[15] 2017 PSE GRC Order at 28, ¶ 83, Table 3A; 34, ¶ 94.

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.[16]

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, as well as its 2018 capital structure, 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. What are the cost rates of debt in PSE's applications?

A. PSE proposes the cost rates of debt as of March 31, 2021. After making the adjustments mentioned above PSE's proposed cost of long-term debt is 5.57 percent,[17] and its cost of short-term debt of 5.65 percent as of this same date.[18] The applications do not identify the cost of long-term debt for PSE, but I have derived these cost rates (5.65 percent for short-term debt and 5.57 percent for long-term debt) from the applications, as shown on Exh. DCP-3.

[16] *Wash. Utils. & Transp. Comm'n v. Avista Corp.*, Dockets UE-170485 & UG-170486, Order 07, p. 39, ¶ 109 (April 26, 2018), *see also*, *Wash. Utils. & Transp. Comm'n v. Puget Sound Energy, Inc.*, Dockets UE-040640 & UG-040641, Order 06 at 13, ¶ 27 (February 18, 2005).
[17] McArthur, Exh. MDM-1T at 15:1-2 and MDM-5 at 1; Parcell, Exh. DCP-3 at 2.
[18] McArthur, Exh. MDM-1T at 15; Parcell, Exh. DCP-3 at 2.

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 PSE?

A. PSE is a not publicly-traded company, nor is 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 and combination gas-electric utilities similar to the PSE using the criteria listed on Exh. DCP-9. 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 or 2;

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

(5) Currently pays dividends; and

(6) 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 Roger 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' 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). I used a quarterly version of the dividend yield, which is expressed as follows:

$$Yield = \frac{\mathrm{D}_0(1 + 0.5\mathrm{g})}{\mathrm{P}_0}$$

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 (August-October 2019). 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 2014-2018 (5-year average) earnings retention, or fundamental growth (per Value Line);
2. Five-year average of historic growth in earnings per share (EPS), dividends per share (DPS), and book value per share (BVPS) (per Value Line);

3. Years 2019, 2020 and 2022-2024 projections of earnings retention growth (per Value Line);
4. Years 2016-2018 to 2022-2024 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-10 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[19]	Mean High[20]	Median Low[21]	Median High[22]
Parcell Proxy Group	7.2%	7.2%	6.4%	8.0%	6.3%	7.8%
Morin Proxy Group	7.7%	7.7%	6.7%	8.9%	6.5%	8.5%

I note that the individual DCF calculations shown on Exh. DCP-10 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 6.3 percent and 8.9 percent. The highest DCF rates are 7.8 percent to 8.9 percent.

I believe a range of 7.8 percent to 8.9 percent (8.35 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. My recommendation focuses on the highest of the DCF results to incorporate my recognition that these results are relatively lower than historic DCF results. As a result, my recommendation should be considered conservative.

[19] Using only the lowest average growth rate.
[20] Using only the highest average growth rate.
[21] Using the lowest median growth rate.
[22] Using only the highest median growth rate.

IX. 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 three-month average yield (August-October 2019) 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 1.96 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 riskier. Utility stocks traditionally have had betas below 1. 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-11 shows the ROE for the S&P 500 group for the period 1978-2018 (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 7.26 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 Morningstar/Ibbotson), using both arithmetic and geometric means. I considered the total returns for the entire 1926-2018 period reported by this source, which are as follows:

	S&P 500	L-T Gov't Bonds	Risk Premium
Arithmetic	11.9%	5.9%	6.0%
Geometric	10.0%	5.5%	4.5%

I conclude from this analysis that the expected risk premium is about 5.9 percent (i.e. average of all three risk premiums: 7.26 percent from Exh. DCP-11; 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[23] 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-12 shows my CAPM calculations. The results are:

	Mean	Median
Parcell Proxy Group	5.6%	5.5%
Morin Proxy Group	5.5%	5.5%

Q. What is your conclusion concerning the CAPM ROE?

A. The CAPM results collectively indicate a ROE of 5.5 percent to 5.6 percent for the groups of proxy utilities. I conclude that an appropriate CAPM ROE estimation for PSE is 5.5 percent to 5.6 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.

[23] 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.

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 PSE's ROE?

A. I apply the CE methodology by examining realized ROEs for the groups of proxy utilities, as well as unregulated companies. My CE analysis also uses prospective returns and thus is not backward looking. I evaluate 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. Given that public utilities have their rates set based upon the book value of their assets (i.e., rate base) and capital structure (i.e., cost of capital), when a utility's stock price exceeds it book value (i.e., M/B greater than 1) this indicates that investors consider its current and prospective earnings as adequate. 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.

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 2002-2018 (i.e., the last 17 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: 2009-2018 (the current business cycle) and 2002-2008 (the most recent business cycle). I have also considered projected ROEs for 2019, 2020 and 2022-2024.

Q. Please describe your CE analysis.

A. Exhibits DCP-13 and DCP-14 contain summaries of experienced ROEs and M/Bs for three groups of companies, while Exh. DCP-15 presents a risk comparison of utilities versus unregulated firms.

Exh. DCP-13 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	9.4%	10.4-10.9%
Median	9.4%	10.0-10.6%
Historic M/B		
Mean	152-161%	171-174%
Median	148-154%	154-165%
Prospective ROE		
Mean	9.4-9.8%	9.6-10.2%
Median	9.3-9.8%	9.8-10.0%

These results indicate that historic ROEs of 9.4 percent to 10.9 percent have been adequate to produce M/Bs of 148 percent to 174 percent for the groups of utilities. Furthermore, projected returns on equity for 2019, 2020 and 2022-2024 are within a range of 9.3 percent to 10.2 percent for the utility groups. These relate to 2018 M/Bs of 180 percent or greater. I note that Dr. Morin's proxy group exhibits both higher ROEs and M/Bs relative to those of my proxy group.

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-14 presents

the earned ROEs and M/Bs for the S&P 500 group over the past seventeen years (i.e., 2002-2018). 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 249 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-15, 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 riskier 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 percent to 10 percent (9.5 percent mid-point). Recent ROEs of 9.4 percent to 10.9 percent have resulted in M/Bs of 148 percent and over. Prospective ROEs of 9.3 percent to 10.2 percent have been accompanied by M/Bs over 180 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 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 the actual and prospective ROEs for my proxy group. I have made no adjustments to these return levels to reflect the high M/Bs.

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	8.35%	7.8-8.9%
CAPM	5.55%	5.5-5.6%
CE	9.5%	9.0-10.0%

These results indicate an overall broad range of 5.5 percent to 10.0 percent, which focuses on the respective individual model results. Using mid-point values, the range is 5.55 percent to 9.5 percent. I recommend a ROE range of 8.9 percent to 9.5 percent for PSE (mid-point of 9.2 percent). This range includes the upper end of my DCF results and the mid-point of my CE results. My specific ROE recommendation is 9.2 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 eight-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. Investors have now experienced nearly a ten-year period of low and declining interest rates, such that these are the "new norm." Consequently, even though the CAPM results have not been given weight in developing my recommended ROE range, they should be considered as one factor in determining where, within the recommended range, the cost of equity for PSE should fall. Therefore, I recommend that PSE's ROE be set at no higher than the mid-point of the ROE range for the proxy companies.

XII. TOTAL COST OF CAPITAL

Q. What is the total COC for PSE?

A. Exh. DCP-3 reflects the total COC for PSE using the Company's proposed capital structure and embedded costs of debt, as well as my ROE recommendations. The resulting COC is a range of 7.19 percent to 7.48 percent. With my 9.2 percent ROE, my COC recommendation is 7.33 percent.

Q. PSE is requesting a two-year rate plan as part of its filings. Do your ROE and COC recommendations apply to all years of this rate plan?

A. Yes, they do. I note, in this regard, that the proposed capital structure matches PSE's recent capital structures, and so my COC recommendations reflect an "on-going" capital structure. The costs of debt reflect 2021 figures and I am not aware of any significant proposed new issues that would impact the 2021 cost of debt. Finally, my ROE recommendation is based on financial models which are forward-looking and thus reflect an on-going perspective.

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:[24]

Study	ROE
DCF-Combination Utilities Value Line Growth	9.7%
DCF-Combination Utilities Analysts Growth	8.3%
Traditional CAPM	8.9%
Empirical CAPM	9.6%
Historical Risk Premium Electric	10.3%
Allowed Risk Premium	10.4%
Average (excluding 8.3% value)	**9.8%**

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.

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 combination gas and electric utilities, using data as of April 2019.[25] In these analyses, he uses "spot" dividend yields for each company.[26] 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 type of growth indicator– projections of EPS growth. As I indicated in my DCF analysis, it is customary and proper to use alternative measures of growth.

[24] Morin, Exh. RAM-1T at 56:2.
[25] *Id*. at 19:3-4.
[26] *Id*. at 19:7-11.

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 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.[27]

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

A. Dr. Morin performs CAPM analyses for his proxy group of electric utilities (0.62 average beta).[28] He combines this 0.62 beta with a 4.2 percent "forecast" cost of long-term (30-year) U.S. Treasury Bonds and a 7.5 percent risk premium to get the following CAPM results:[29]

$$K = RF + \beta(RP) = 4.2\% + 0.62\ (7.5\%) = 8.9\%$$

[27] Morin, Exh. RAM-1T at 22:12-18.
[28] Morin, Exh. RAM-1T at 37:21, *but see*, *Id*. at 31:18 (On this page, the average beta is stated as .60, but this is likely a typographical error.)
[29] *Id*. at 45:10-12.

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. By definition, projected interest rates are not risk-free because they are not currently available as an alternative investment. It is improper to use projected interest rates, because they are not measurable and not achievable. For example, if the current yield on 20-year U.S. Treasury Bonds is about 2.0 percent, this reflects the rate that investors can actually receive on their investment. Investors cannot receive a projected yield on their investments since such a yield is speculative, not actual. Instead, 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. Projected interest rates, in contrast, are not measurable and not achievable.

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 projected stock prices as the basis for the dividend yield in a DCF analysis, as use of projected 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. Did Dr. Morin use projected interest rates in his ROE analyses in PSE's last rate proceeding?

A. Yes. Dr. Morin's CAPM and risk premium analyses in Docket UE-170033/UG-170034 used a projected yield of 4.4 percent for 30-year U.S. Treasury Bonds.[30]

Q. Have long-term utility bond yields risen in recent months as predicted by Dr. Morin?

A. No, they have not. The table below depicts the trends in 30-year U.S. Treasury bond yields over the 2017-2019 period (i.e., the time frame since the filing of Dr. Morin's prior testimony).

	30-Year U.S. Treasury Bonds		
Year	High	Low	Average
2017	3.08%	2.77%	2.89%
2018	3.36%	3.01%	3.11%
2019	3.04%	2.12%	2.74%

Source: Council of Economic Advisors, "Economic Indicators."

This indicates that 30-year U.S. Treasury bonds have been well-below the 4.4 percent level used by Dr. Morin in his 2017 testimony. In addition, rates have declined by more than 90 basis points since the end of 2018. This invalidates Dr. Morin's use of projected interest rates.

[30] *Wash. Utils. & Transp. Comm'n v. Puget Sound Energy*, Dockets UE-170033 & UG-170034, Morin, Exh. RAM-1T at 33:4-5 (January 13, 2017).

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

A. Dr. Morin's 7.5 percent risk premium is partially derived from the 1926-2018 Duff & Phelps (formerly Morningstar/Ibbotson) study (cited previously) showing a 6.9 percent differential between common stocks and the "income component" of U.S. Treasury Bonds.[31]

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. [32] As such, he has ignored the capital gains component of the Treasury bonds return. As I indicated earlier in my testimony, the differential between total returns of common stocks and Treasury bonds is 6.0 percent (a figure Dr. Morin acknowledges on page 38).[33] 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).[34] I discussed this issue earlier in my testimony.

Q. Please describe Dr. Morin's "empirical" CAPM analysis. Why is it improper to use an ECAPM for public utilities?

A. Dr. Morin also employs what he describes as an "empirical" CAPM analysis. The ECAPM is improper to use for PSE because it "adjusts" each proxy company's

[31] Morin, Exh. RAM-1T at 38:4-17.
[32] *Id*. at 31:16-17; 44:7-20.
[33] *Id*. at 38:15.
[34] Morin, Exh. RAM-1T at 41:5-9; 42:3-14.

actual beta by assigning only 75 percent weight to the actual beta and "assumes" a beta of 1.0 with the remaining 25 percent weight. As a result, the ECAPM does not use the actual betas of the proxy companies, but rather calculates hypothetical betas that are upward biased due to the fact that electric utility betas are below 1.0. In contrast, the traditional CAPM directly recognizes and quantifies the risk of individual companies through the use of the beta coefficient. As such, each proxy company's risk and beta are identified and used in the calculation of its CAPM ROE.

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 early 2019) 4.2 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/loss plus interest) and the S&P Electric Utilities Index (capital gains/losses plus dividend yield) over the period 1930-2018.[35] 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 4.2 percent

[35] Note that Dr. Morin's direct testimony cites a 1930-2015 time frame (Morin, Exh. RAM-1T at 50:4-7); however, in response to discovery requests he has noted that the 2015 date is a typographical error.

forecast long-term government bond yield to the 6.1 percent historic risk premium to get a 10.3 percent result.[36]

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 1930. He has made no demonstration that economic and financial conditions in 2019 are similar to those over the past eighty plus years. The use of such a methodology implicitly assumes that the events of each of these years can have the same influence on investor decisions at the current time. It is unlikely that investors give the financial and economic conditions of the distant past the same weight as the financial and economic conditions of the recent past.

In addition, the risk premium 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.

[36] Morin, Exh. RAM-1T at 50:15-21.

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 1986-2018 period. The average spread over this period was 5.58 percent[37], 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 6.2 percent risk premium is appropriate in conjunction with a 4.2 percent Treasury bond yield.[38] 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.[39]

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 allowed risk premium analysis, (Regulatory Focus, published by Regulatory Research Associates, as cited earlier in my testimony), the annual average return on equity awards[40] have been:

Year	Electric	Natural Gas
2006	10.34%	10.40%
2007	10.32%	10.22%
2008	10.37%	10.39%
2009	10.52%	10.22%
2010	10.29%	10.15%
2011	10.19%	9.91%
2012	10.02%	9.93%
2013	9.82%	9.68%
2014	9.76%	9.78%

[37] Morin, Exh. RAM-1T at 52:13-14.
[38] *Id*. at 53:5-8.
[39] *Id*. at 50:7-10.
[40] S&P, RRA, "Regulatory Focus," January 31, 2019, General Rate Cases.

2015	9.60%		9.60%
2016	9.60%		9.53%
2017	9.68%		9.73%
2018		9.55%	9.60%

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. Does this conclude your testimony?

A. Yes, it does.