**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

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|---|---|
| WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, | |
| Complainant, | DOCKET NOS. UE-121697 and UG-121705 (*consolidated*) |
| v. | |
| PUGET SOUND ENERGY, INC., | |
| Respondent. | |
| WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, | |
| Complainant, | DOCKET NOS. UE-130137 and UG-130138 (*consolidated*) |
| v. | |
| PUGET SOUND ENERGY, INC., | |
| Respondent. | |

**PREFILED REBUTTAL TESTIMONY (NONCONFIDENTIAL) OF
DR. MICHAEL J. VILBERT
ON BEHALF OF PUGET SOUND ENERGY, INC.**

**DECEMBER 19, 2014**

**REVISED
FEBRUARY 5, 2015**

1 **PUGET SOUND ENERGY, INC.**

2 **PREFILED REBUTTAL TESTIMONY (NONCONFIDENTIAL) OF**
3 **DR. MICHAEL J. VILBERT**

4 **I.     INTRODUCTION**

5 **Q.     Are you the same Dr. Michael J. Vilbert who provided prefiled direct**

6 **testimony and supporting exhibits on behalf of Puget Sound Energy, Inc.**

7 **("PSE") in these proceedings?**

8 A.     Yes.  I filed prefiled direct testimony, Exhibit No. ___(MJV-1T), and supporting

9 exhibits, Exhibit No. ___(MJV-2) through Exhibit No. ___(MJV-17), on

10 November 5, 2014.

11 **Q.     Please summarize the purpose of your prefiled rebuttal testimony.**

12 A.     This prefiled rebuttal testimony addresses the following:

13       (i)     the Prefiled Direct Testimony of Dr. Christopher A.
14              Adolph, Exhibit No. ___(CAA-1T), on behalf of the Public
15              Counsel Unit of the Washington Attorney General's Office
16              ("Public Counsel") and the Industrial Customers of
17              Northwest Utilities ("ICNU");

18       (ii)    the Prefiled Direct Testimony of Mr. Stephen G. Hill,
19              Exhibit No. ___(SGH-2T), on behalf of Public Counsel; and

20       (iii)   the Prefiled Response Testimony of Mr. Michael P.
21              Gorman, Exhibit No. ___(MPG-23T) , on behalf of ICNU.

22 In particular, I respond to their comments and conclusions regarding the

23 implications of the decoupling studies performed by The Brattle Group.  In

24 addition, I critique Mr. Hill's calculations with regard to the effect of decoupling

25 on the cost of capital for PSE.

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**Q. Please summarize the conclusions of your rebuttal testimony.**

A.      The Prefiled Direct Testimony of Dr. Christopher A. Adolph, Exhibit

No. ___(CAA-1T), boils down to a conclusion that the evidence from the

decoupling studies is "good enough" to support a conclusion that decoupling

reduces the cost of capital.  In response to his testimony, I address the important

policy underlying the implementation of decoupling, which Dr. Adolph, by his

own admission,[1] is not in a position to address or evaluate.  Additionally, the

Prefiled Rebuttal Testimony of Dr. Jeffrey A. Dubin, Exhibit No. ___(JAD-1T),

responds to Dr. Adolph's testimony from a statistical perspective and rejects the

conclusion that the evidence is "good enough" to support a conclusion that

decoupling reduces the cost of capital.

Section III of this prefiled rebuttal testimony responds to a number of Mr. Hill's

misinterpretations or misstatements of my prefiled direct testimony.  The changes

made to the updated versions of the decoupling studies were made for valid

reasons to improve the validity and reliability of the studies and not for some

sinister reason as Mr. Hill seems to suggest.[2]  I then demonstrate that Mr. Hill's

methodology to estimate the effect of decoupling on the cost of capital is

theoretically and empirically flawed.  If Mr. Hill had been true to his own theory,

his methodology would result in an estimated reduction in the allowed return on

equity of 5.29 percent resulting in a net allowed return on equity of about

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[1]   Adolph, Exh. No. ___(CAA-1T) at page 3, lines 4-6.

[2]   At several places in his testimony, Mr. Hill states or implies that the changes made in the updated studies were done with the express purpose of reaching a particular outcome.  *See, e.g.,* Hill, Exh. No. ___(SGH-~~1~~2T), at page 98, line 5, through page 99, line 21.  This is not true.

| 1 | Q. | **Which of The Brattle Group studies should be the focus of debate in this** |
| 2 | | **proceeding?** |
| 3 | A. | The two updated versions of the studies are the more appropriate versions on |
| 4 | | which to concentrate because they represent the current "state of the art" for our |
| 5 | | investigations.  The assets of the companies in both samples are heavily |
| 6 | | concentrated in regulated assets, and contrary to Mr. Hill's claim[6] the percentage |
| 7 | | of regulated assets in the gas LDC sample averages about 79 percent as shown in |
| 8 | | Exhibit No. ___(MJV-21).  Mr. Hill seems to prefer the original version of the |
| 9 | | electric study.[7]  In my view, however, the updated electric study is preferable to |
| 10 | | the original electric study because it has a longer period of data, and we have |
| 11 | | updated some of the underlying information, such as recognizing that one sample |
| 12 | | company had straight fixed-variable ("SFV") rates.  Contrary to Mr. Hill's |
| 13 | | assertion that the March 2014 study on electric decoupling decided "to exclude |
| 14 | | SFV rate design as dissimilar to full decoupling,"[8] The Brattle Group has never |
| 15 | | said that straight fixed-variable rates are dissimilar.  In fact, the original gas LDC |
| 16 | | decoupling study says exactly the opposite (i.e., straight fixed-variable rates is a |
| 17 | | form of decoupling) and The Brattle Group includes the effect of straight fixed- |
| 18 | | variable rates in the paper.  The main reason that the original electric utility study |
| 19 | | did not consider straight fixed-variable rates is because straight fixed-variable |
| 20 | | rates are relatively uncommon for electric utilities through 2012.  The updated |

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[6]  Hill, Exh. No. ___(SGH-~~1~~2T) at page ~~100~~103, line~~s~~ ~~156~~-208.

[7]  *See, e.g.,* Hill, Exh. No. ___(SGH-~~1~~2T) at page 97, line 8, through page 103, line 11.

[8]  Hill, Exh. No. ___(SGH-~~1~~2T) at page 101, line 1.

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1       subsequently higher rates.  In comparison, the gas LDC industry seems staid.

2       Although The Brattle Group studies attempted to address these issues, it is

3       possible that variables we omitted could be affecting the results, particularly for

4       the electric utility study whose industry is much less settled than the gas LDC

5       industry.

6 **Q.**       **Please review the updated results for the gas LDC industry in comparison to**

7            **the electric utility industry.**

8 A.       The coefficient on the decoupling index as shown in Table 1 above is about

9       minus 9 basis points with a *p*-value of about 0.37 for the gas ~~LDF~~LDC industry study,

10       as compared to about minus 26 basis points with a *p*-value of about 0.17 for the

11       electric utility study.  For the more reliable gas LDC sample, the coefficient is

12       very close to zero, indicating no effect on the cost of capital from decoupling.

13 **Q.**       **Why did you not replicate the test on the possibility of leading effect from**

14            **capital markets anticipating decoupling, as was done with the original**

15            **version of the electric sample?**

16 A.       Although the theory underlying the leading indicator test is sound, we did not

17       replicate the leading indicator tests in the update because we did not believe that

18       the test provided much in the way of valid information because practical

19       implication is so imprecise.

20 **Q.**       **What is the theory underlying the leading indicator test?**

21 A.       The theory is that information on the proposal to implement decoupling is known

22       by investors prior to the date the regulator's final decision to adopt decoupling (or

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1    **A.**    **None of the Criticisms of The Brattle Group Decoupling Studies or**
2             **My Direct Testimony are Valid**

3    **Q.**    **Is Mr. Hill correct about the types of decoupling that were included in the**

4        **various studies?**

5    A.    No. At various points in his testimony, Mr. Hill asserts that The Brattle Group

6        changed the types of decoupling considered in the two studies and their updates.[14]

7        Many of these assertions are incorrect. To avoid confusion about what changed in

8        the updates to the two studies, I prepared Exhibit No. ___(MJV-19), which lists the

9        changes in the two studies including the two changes we made in the types of

10       decoupling considered.

11    **Q.**    **Did you submit the original study on the electric utility industry in this**

12        **proceeding?**

13    A.    Yes. Contrary to Mr. Hill's statement,[15] I did submit a copy of the study, "The

14        Impact of Revenue Decoupling on the Cost of Capital for Electric Utilities: An

15        Empirical Investigation," March 2014 as part of the supporting workpapers in this

16        proceeding.

17    **Q.**    **What were the changes in types of decoupling considered in the updated**

18        **studies?**

19    A.    We made minor changes. The original gas LDC study considered lost revenue

20        adjustment mechanisms in addition to true-up decoupling and straight-fixed

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[14] *See, e.g.,* Hill, Exh. No. ___(SGH-~~1~~2T) at page 97, line 8, through page 103, line 11.
[15] *See* Hill, Exh. No. ___(SGH-2T), at page 91, lines 15-17.

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1　Q.　**Do you agree with Mr. Hill's concern that use of the multistage discounted**

2　　　**cash flow model could "damp down or lessen any apparent change"[16] in the**

3　　　**cost of capital?**

4　A.　No.  The effect of decoupling is to reduce the volatility of revenues.  The theory

5　　　underlying the belief that the cost of capital is reduced is based upon the idea that

6　　　the expected cash flows are the same but that decoupling reduces their volatility.

7　　　Decoupling is not expected to affect the growth rate of earnings going forward.

8　　　This means that if there is an effect on the cost of capital, it would likely show up

9　　　in the company's stock price not its expected growth rate of earnings.  Use of the

10　　　multistage discounted cash flow model removes some of the large swings in

11　　　estimated growth rates that could introduce noise into the regressions but has no

12　　　effect on the expected dividend yield in the model.

13　Q.　**Have you published the updated studies for the gas LDC and electric utility**

14　　　**industries?**

15　A.　Mr. Hill is correct that these updated studies have not yet been published.[17] The

16　　　updates were done initially for this proceeding, but we intend to publish them.  In

17　　　any case, in response to a series of data requests, The Brattle Group has provided

18　　　all of the data and software programs we used to estimate the results.  Dr. Adolph

19　　　has confirmed that he has replicated our results for the updated studies.[18]

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[16]　Hill, Exh. No. ___(SGH-2T) at page 98, lines 16-~~18~~23.

[17]　Hill, Exh. No. ___(SGH-2T) at page 97, lines 19-20.

[18]　Adolph, Exh. No. ___(CAA-1T), at page 26, lines 14-16.

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1    difference in return on equity between companies with and without decoupling.

2    Mr. Hill's concern here is not relevant.

3  **Q.    Do your decoupling studies attempt to account for changes in interest rates**

4      **over time?**

5  A.    Yes.  Mr. Hill says "[i]t is also not clear that those studies are designed to account

6      for changes in interest rates over time as was the March 2014 report."[24]  In the

7      studies for both industries, however, we use an indicator variable for each

8      separate period of the cost of capital estimates.  The purpose of the period

9      variable is to reflect differences in such things as economic activity and interest

10      rates which may affect the overall level of the cost of capital estimates.  As shown

11      in Exhibit No. ___(MJV-20), the period variables were used in all versions of

12      both reports.

13  **Q.    In your reports on the effect of decoupling on the cost of capital, did you**

14      **claim that decoupling could only reduce diversifiable risk?**

15  A.    No.  Mr. Hill's says that I claim that "decoupling impacts only diversifiable

16      risk."[25]  He then goes on to say

17      there is no basis in the financial literature of which I am aware
18      (and none is cited by Dr. Vilbert) that supports the notion that
19      reducing the total risk of an asset (e.g., lowering the revenue and
20      net income volatility of a regulated utility) works to lower only
21      risk that is diversifiable.[26]

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24   Hill, Exh. No. ___(SGH-2T), at page ~~103~~102, line 23, through page 1~~03, line 1~~.
25   Hill, Exh. No. ___(SGH-2T), at page 104, line 5.
26   Hill, Exh. No. ___(SGH-2T), at page 104, lines 7-11.

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1 **Q.     Please turn to Mr. Hill's empirical analysis, what is Mr. Hill's first step?**

2 A.     Mr. Hill first provides a regression equation to explain how PSE's net revenues

3        change over the period 1999 to 2013.[54] He uses two causal, or explanatory,

4        variables: (i) the State of Washington's Gross State Product and (ii) Heating

5        Degree Days in the state. His equation has an R-squared of about 90 percent

6        which means that the two variables (economy and weather) explain about

7        90 percent of the change in PSE's revenues.[55]

8        This result and the equation that produced it have several problems. First, a time

9        series regression will bias the correlation upward if it does not treat the changes or

10       first differences between years,[56] not the absolute values in the years. This R-

11       squared[57] of 90 percent is inflated because revenues and Washington's Gross

12       State Product are both growing (i.e., trending together). In fact, had Mr. Hill used

13       net income instead of net revenue in his regression equation, the R-Squared would

14       be much smaller. Running the same regression with net-income yields an R-

15       Squared of about ~~28~~26 percent.[58]

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[54]    Mr. Hill uses revenues net of fuel cost adjustment and the costs of purchase power because these costs are passed through.

[55]    Hill, Exhibit No. ___(SGH-19), at page 1 (providing an R-Squared = 0.902910203).

[56]    First differences are calculated as this period's value minus last period's value. This is done for each period in the study.

[57]    R-Squared represents a "goodness of fit" of the model and is interpreted as the percentage of variation in the dependent variable explained by the model.

[58]    The calculations are not provided here because ultimately Mr. Hill does not use the first step regression in his analysis. He simply assumes a percentage of the reduction in revenue volatility due to decoupling.

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1    methodology.[75]  This is clearly not a credible result because subtracting

2    5.29 percent from PSE's allowed return on equity of 9.8 percent would be

3    4.51 percent, which is less than the cost of debt for PSE. For any company, its

4    cost of equity is always greater than its cost of debt because debt holders are paid

5    before equity investors.

6  **Q.    Please summarize this third criticism of Mr. Hill's methodology.**

7  A.    The point here is that the change in the shape of the distribution of net revenues as

8        measured by the third standard deviation is not a measure of the cost of capital.

9        Faithful application of Mr. Hill's theory produces a nonsensical result of a cost of

10       equity less than the cost of debt.  Moreover, the cost of capital is measured by the

11       relationship between the return on an investment and the returns on the capital

12       market.  A company's total risk can be reduced through a reduction in

13       diversifiable risk without affecting the systematic risk (i.e., the cost of capital) of

14       the investment in any way.

15 **Q.    Is it possible to reduced volatility of revenues or market returns without**

16      **reducing the cost of capital?**

17 A.    Yes.  The assertion that a reduction in volatility, whether of revenues or of market

18       returns, automatically leads to a reduction in the cost of capital is directly rejected

19       by portfolio theory for which Professor Harry Markowitz won the Nobel Prize in

20       Economics in 1990.  His work showed that the total risk of a portfolio could be

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[75]   The calculation is 10.3 percent times Average Annual Net Revenues of 1.529 billion = $157.0 million. Mr. Hill calculates that 1 percent ROE is equal to $29.67 million (See Hill Testimony, pp. 121-122) so dividing $157.0 by $29.67 = 5.29 percent.

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1     reduced without reducing the expected return (i.e., the cost of capital of the

2     portfolio). Portfolio theory recommends combining investments in a portfolio to

3     reduce risk. This topic is now standard in all textbooks on investing or corporate

4     finance.[76] Figure 2 below is reproduced from Principles of Corporate Finance,

5     10th edition, by Brealey, Myers and Allen.[77] It shows the effect of diversification

6     on total risk. As additional securities are added to a portfolio (horizontal axis),

7     total risk (vertical axis) is reduced by the elimination of diversifiable risk. In

8     Figure 2, $\sigma_P$ represents the standard deviation of a portfolio with an average beta

9     of 1.5, 1.0 or 0.5. The standard deviation of a portfolio with a beta of 1.0 is also

10     the standard deviation of the market portfolio. Note that in reducing the standard

11     deviation of returns (i.e., total risk), the beta of the portfolio (and hence its cost of

12     capital) did not change because the beta of the portfolio does not change.

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[76]   For example, see Chapter 7, "Introduction to Risk and Return", in Brealey, Myers and Allen, *Principles of Corporate Finance* (10th ed. 2011).

[77]   *Principles of Corporate Finance* at page 173176.

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**Figure 2. Effect of Diversification on Total Risk**
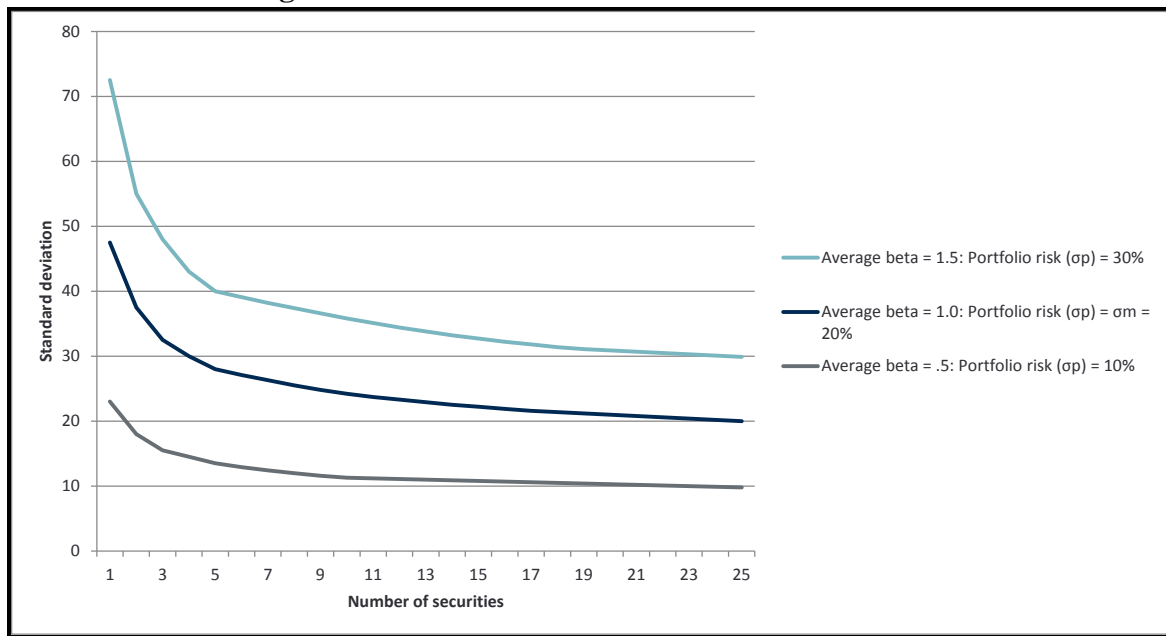


1    Portfolio theory directly contradicts Mr. Hill's assertion[78] that an investor would

2    be indifferent to a reduction in expected return on equity if in exchange the

3    volatility of revenues were reduced.  As Mr. Hill notes,[79] investors care about

4    systematic risk, so only if the reduction in volatility of revenues somehow

5    translated into a reduction in systematic risk, would an investor expected a lower

6    cost of capital.  Mr. Hill has *not* demonstrated any link between reduced volatility

7    of revenues and systematic risk.

8  **Q.   Is there a contradiction between the reduction in volatility of revenues from**

9       **decoupling and no reduction in the cost of capital as a result?**

10  A.    No.  There is no contradiction between the reduction in volatility of revenues

11       from decoupling and no reduction in the cost of capital as a result because any

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[78]  Hill, Exh. No. ___(SGH-2T), at page 120, lines 12-15.

[79]  Hill, Exh. No. ___(SGH-2T), at page 32, lines 8-13.

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