

**EXHIBIT NO. \_\_\_(MJV-18T)**  
**DOCKET NO. UE-121697/UG-121705**  
**DOCKET NO. UE-130137/UG-130138**  
**WITNESS: DR. MICHAEL J. VILBERT**

**BEFORE THE  
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION,

Complainant,

v.

PUGET SOUND ENERGY, INC.,

Respondent.

DOCKET NOS. UE-121697  
and UG-121705 (*consolidated*)

WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION,

Complainant,

v.

PUGET SOUND ENERGY, INC.,

Respondent.

DOCKET NOS. UE-130137  
and UG-130138 (*consolidated*)

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

**DECEMBER 19, 2014**

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

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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-2), 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.

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

2 A. The Prefiled Direct Testimony of Dr. Christopher A. Adolph, Exhibit  
3 No. \_\_\_(CAA-1T), boils down to a conclusion that the evidence from the  
4 decoupling studies is “good enough” to support a conclusion that decoupling  
5 reduces the cost of capital. In response to his testimony, I address the important  
6 policy underlying the implementation of decoupling, which Dr. Adolph, by his  
7 own admission,<sup>1</sup> is not in a position to address or evaluate. Additionally, the  
8 Prefiled Rebuttal Testimony of Dr. Jeffrey A. Dubin, Exhibit No. \_\_\_(JAD-1T),  
9 responds to Dr. Adolph’s testimony from a statistical perspective and rejects the  
10 conclusion that the evidence is “good enough” to support a conclusion that  
11 decoupling reduces the cost of capital.

12 Section III of this prefiled rebuttal testimony responds to a number of Mr. Hill’s  
13 misinterpretations or misstatements of my prefiled direct testimony. The changes  
14 made to the updated versions of the decoupling studies were made for valid  
15 reasons to improve the validity and reliability of the studies and not for some  
16 sinister reason as Mr. Hill seems to suggest.<sup>2</sup> I then demonstrate that Mr. Hill’s  
17 methodology to estimate the effect of decoupling on the cost of capital is  
18 theoretically and empirically flawed. If Mr. Hill had been true to his own theory,  
19 his methodology would result in an estimated reduction in the allowed return on  
20 equity of 5.29 percent resulting in a net allowed return on equity of about

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<sup>1</sup> Adolph, Exh. No. \_\_\_(CAA-1T) at page 3, lines 4-6.

<sup>2</sup> 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-1T), at page 98, line 5, through page 99, line 21. This is not true.

1 4.51 percent which is less than the cost of debt. This, of course, cannot be the  
2 true effect, but it demonstrates that Mr. Hill's method is fatally flawed and should  
3 be disregarded completely.

4 **II. INTERPRETING THE RESULTS OF THE**  
5 **DECOUPLING STUDIES**

6 **Q. What topics does this section of your rebuttal address?**

7 A. In this section of my rebuttal, I address Dr. Adolph's testimony with a focus on  
8 why I believe that the results of The Brattle Group decoupling studies do not  
9 support his recommendation that the studies provide "good enough" evidence that  
10 the cost of capital for PSE should be reduced. On the contrary, the studies show  
11 that there is no statistically significant evidence that decoupling reduces the cost  
12 of capital.

13 In order to fully respond to the testimony of Dr. Adolph, it is important to review  
14 the policy of decoupling and to understand the reasons why it has been adopted by  
15 state utility commissions around the country. Dr. Adolph, by his own admission,  
16 is not an expert in the policy of decoupling, the cost of capital, financial  
17 accounting or utility accounting, and it is important to recognize his lack of  
18 substantive context on these issues when considering his views.

19 **Q. Please discuss the policy of decoupling and why it was adopted.**

20 A. In this proceeding, it is critical to keep in mind the reason that decoupling was  
21 proposed and adopted in the first place because the original purpose of decoupling  
22 seems to get lost in the discussion of the effect of decoupling on the cost of  
23 capital. Regulated electric and gas local distribution companies ("LDCs") recover

1 a large portion of their fixed costs through a variable charge on the amount of  
2 consumption. In other words, the variable charge to customers is much larger  
3 than the actual variable cost of producing and transmitting another kilowatt-hour  
4 (“kWh”) of energy or million cubic feet (“MMCF”) of gas. As sales vary from  
5 the forecast used to set rates, a regulated company will over recover or under  
6 recover its expected fixed costs.

7 For a variety of reasons, regulators, environmentalists and others wished to  
8 increase the emphasis on energy efficiency, distributed generation, demand-side  
9 management, and other such policies designed to reduce greenhouse gas  
10 emissions, conserve energy and hopefully costs.

11 Regulators, of course, realized that regulated companies would not be able to fully  
12 recover their fixed costs if sales decline more than the sales forecast used to set  
13 rates, and that, if sales were greater than forecast, the utility would over recover  
14 its fixed costs. Absent decoupling, utilities would have an incentive to increase  
15 sales contrary to the policy goal of reduced consumption. In addition, in an  
16 environment with flat or falling consumption per customer, sales forecasts used to  
17 set rates become critically important and controversial. Errors in forecasts would  
18 potentially lead to the increased frequency of rate cases as sales differ  
19 substantially from forecast. Every month of sales less than forecast results in an  
20 increased loss to the regulated company.

21 The purpose of decoupling is to reduce the throughput incentive for a regulated  
22 company that recovers a large portion of its fixed costs through a variable charge.

1 Selling more energy increases the company's profits. Decoupling was a policy  
2 response to these and other regulatory issues.

3 **Q. Does decoupling provide benefits to both customers and the regulated**  
4 **company?**

5 A. Yes. Contrary to unsupported claims that customers are bearing all of the risk,<sup>3</sup>  
6 decoupling with true-up provides symmetrical benefits. It ensures that customers  
7 are charged no more—but also no less—than the approved revenue requirement  
8 regardless of actual sales. Under fair regulation, rates are set such that the  
9 regulated company would expect to recover its costs on average. If sales are  
10 greater than the forecast used to set rates, the regulated company may over-  
11 recover its costs. If sales are less than forecast, the regulated company may  
12 under-recover. Decoupling with true-up ensures that the regulated company  
13 recovers its forecast revenues although there may be a lag or lead in recovery.

14 As noted above, decoupling also has the additional benefit of reducing the  
15 controversy surrounding the estimates of expected sales used to set rates because  
16 errors in the forecast are trued-up by the policy. Because the benefits of the  
17 policy are symmetrical and it has not been demonstrated that there is a statistically  
18 significant effect on the cost of capital, there is no need to reward customers as  
19 Mr. Gorman suggests.<sup>4</sup>

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<sup>3</sup> See, e.g., Hill, Exh. No. \_\_\_(SGH-2T) at page 84, lines 6-11; Gorman, Exh. No. \_\_\_(MPG-23T) at page 60, lines 8-12.

<sup>4</sup> Gorman, Exh. No. \_\_\_(MPG-23T) at page 60, lines 8-12

1 **Q. Why is it important to review the reasons that decoupling was originally**  
2 **adopted?**

3 A. There seems to be a (sometimes unstated) belief that if decoupling is not shown to  
4 reduce the cost of capital, it should be eliminated as a failed policy. The primary  
5 purpose of decoupling is not to reduce the cost of capital, and decoupling should  
6 not be considered a failure if it does not reduce the cost of capital.

7 **Q. Why did The Brattle Group perform the decoupling studies reviewed by**  
8 **Dr. Adolph?**

9 A. Members of The Brattle Group were involved in several regulatory proceedings in  
10 which the effect of decoupling on the cost of capital was an issue. In those  
11 proceedings, some interveners asserted that decoupling must reduce the cost of  
12 capital because it reduced the volatility of revenues, but, in my experience, no  
13 intervener or company witness offered any empirical evidence to support or reject  
14 the assertion. The Brattle Group's first study of the effect of decoupling in the  
15 gas LDC industry was done to investigate the hypothesis empirically. The  
16 statistical results from the original gas LDC study did not support the hypothesis  
17 that decoupling reduced the cost of capital.

18 **Q. How many studies on the effect of decoupling has The Brattle Group**  
19 **performed?**

20 A. The Brattle Group has performed studies on two industries: the gas LDC industry  
21 and the regulated electric utility industry. We have updated the gas LDC study  
22 several times and the electric utility industry study once.



1 **Q. Mr. Hill has raised questions about the updates made to the natural gas and**  
2 **electric studies.<sup>5</sup> Did you change the methodology used to estimate the effect**  
3 **of decoupling when you updated these studies?**

4 A. Yes. Although we have used linear regression for both industries, we changed  
5 (i) the software package used to estimate the model; (ii) the adjustment to the  
6 error terms from the first gas LDC study; and (iii) the types of decoupling policies  
7 included in the studies. Please see Exhibit No. \_\_\_\_ (MJV-19), which lists (for  
8 both studies and the updates) the study period, data used to estimate the cost of  
9 capital, the sources of data regarding which subsidiaries had decoupling, and the  
10 types of decoupling analyzed. Please also see Exhibit No. \_\_\_\_ (MJV-20), which  
11 provides information on the discounted cash flow model used, the variables  
12 included in the regressions, the scenarios considered, the method used to estimate  
13 the standard errors, and the software package used.

14 **Q. Why did The Brattle Group change the data and the methodology?**

15 A. Research represents learning. As the analyses progressed, The Brattle Group  
16 refined dates for release of decisions, updated and corrected some data points,  
17 included additional information from new information sources, used a different  
18 and more flexible software program, improved the treatment of residuals, and  
19 extended the length of the study period. For this proceeding, we also sought to  
20 make the studies for the two industries compatible in terms of methodology and  
21 data to the extent possible.

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<sup>5</sup> See, e.g., Hill, Exhibit No. \_\_\_\_ (SGH-2T) at page 97, line 8, through page 99, line 21.

- 1 **Q. Have the results changed as you have updated the two studies?**
- 2 A. Although the basic conclusion that there is no statistically significant evidence
- 3 that decoupling reduces the cost of capital has not changed, the absolute
- 4 magnitude of the negative coefficient on the decoupling index are stable in gas
- 5 and decrease in absolute size for the electric industry. The *p*-values are also
- 6 larger. These statistical results are presented in Table 1 below. The apparent
- 7 relationship between decoupling and the cost of capital seems to be weakening
- 8 with additional study.

**Table 1. Tabulation of Statistical Results across Studies**

	Coefficient of Decoupling Index Variable (in basis points)	1-tail p-value (should be <= .05)	R-Squared
<b>Gas Delivery Industry Study</b>	<i>[A]</i>	<i>[B]</i>	<i>[C]</i>
<b>Published Brattle Report - Amended June 2012, Original March 2011</b>	-8.6	0.212	0.89
<b>Updated for the Puget filing in WUTC Docket No. UE-121697 and UG-130138 - October 2014</b>	-8.7	0.373	0.81
 <b>Electric Industry Study</b>			
<b>Published Brattle Report - March 2014</b>	-40.8	0.140	0.68
<b>Updated for the Puget filing in WUTC Docket No. UE-121697 and UG-130138 - October 2014</b>	-25.7	0.173	0.78

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<sup>6</sup> 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.<sup>7</sup> 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,”<sup>8</sup> 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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<sup>6</sup> Hill, Exh. No. \_\_\_(SGH-1T) at page 100, line 15-20.  
<sup>7</sup> See, e.g., Hill, Exh. No. \_\_\_(SGH-1T) at page 97, line 8, through page 103, line 11.  
<sup>8</sup> Hill, Exh. No. \_\_\_(SGH-1T) at page 101, line 1.

1 study also recognized that some companies evolved over time through mergers  
2 and acquisitions. Between the studies of the two industries, the gas LDC study is  
3 likely to be the more reliable study.

4 **Q. Why do you believe that the gas LDC study is likely to be the more reliable**  
5 **study?**

6 A. That belief is based upon the nature of the gas LDC industry compared to the  
7 electric utility industry.

8 First, it is important to keep in mind that the true-up decoupling policy works  
9 similarly for the gas and electric industry as does the straight fixed-variable  
10 ratemaking policy. Therefore, whatever effect adoption of decoupling may have  
11 on the cost of capital, it will affect both the gas LDC industry and the electric  
12 utility industry similarly.

13 Second, it does not seem to be a controversial statement to suggest that the  
14 electric utility industry has been undergoing far more disruption than the gas LDC  
15 industry. There have been more mergers and acquisitions in the electric utility  
16 industry than in the gas LDC industry. Moreover, the electric industry is  
17 struggling to adapt to (i) the introduction of distributed generation, (ii) connect  
18 and integrate the proliferation of renewable energy resources, and (iii) adjust to  
19 the effects of demand-side management and energy efficiency. Most of these  
20 have been ongoing for a number of years, but the rapidly falling cost of  
21 distributed generation has accelerated the need for major changes in the industry.  
22 There are even articles warning of a “death spiral” for electric utilities stemming  
23 from increased rates and declining sales inducing more distributed generation and

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 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

1 not) is announced or published. If there is an effect on the cost of capital from  
2 adoption of decoupling, the effect is likely to show up on the market well before a  
3 formal announcement.

4 **Q. What are the practical difficulties with the leading indicator test?**

5 A. The test requires an assumption on when the market effect of a decision not yet  
6 announced occurs. Logically, the market is aware of the proposal for decoupling  
7 and considers at least three factors.

- 8 1. What is the probability that the proposal will be adopted?
- 9 2. What is the likely effect on the company and its cost of  
10 capital?
- 11 3. If adopted, is the decision likely to survive legal challenge,  
12 if any?

13 The data for the original version of the electric utility study is quarterly. We  
14 characterized a company as decoupled if the published decision of the adoption of  
15 decoupling occurred anytime within the quarter. So, the actual decision date  
16 could be at the beginning or end of the period. In addition, in some cases, the date  
17 of the decision was preceded by an announcement on the status of decoupling that  
18 could precede the decision by several quarters. It is also likely that the  
19 announcement effect varies considerably from jurisdiction to jurisdiction because  
20 the level of uncertainty as to whether and when decoupling may be adopted is  
21 much higher in some states.

1 **Q. Do the leading indicator tests represent independent tests of the effect of**  
2 **decoupling on the cost of capital?**

3 A. No. Both Dr. Adolph and Mr. Hill refer to results from the multiple tests of the  
4 “lead” effect of decoupling as if these results represent multiple independent tests  
5 on the cost of capital.<sup>9</sup> The leading indicator tests rely upon exactly the same  
6 sample data set but modified by an adjustment as to when decoupling affected the  
7 market determined cost of capital.

8 **Q. Do you recognize the limitations of The Brattle Group reports?**

9 A. Yes. The Brattle Group has used all available data for both the electric sample  
10 and the gas LDC sample, and we did not “cherry pick” the data.<sup>10</sup> We were  
11 careful to explain our data sources and our various filters to arrive at our final  
12 samples. We used every observation we had that was not deleted for the reasons  
13 specified in the reports. However, the samples are small as Dr. Adolph notes.

14 After deleting missing data, the November 2014 electric model  
15 includes only 14 firms, but only 12 firms were observed to  
16 experience a change in the degree of decoupling within the set of  
17 observations modeled by the linear regression. Because these  
18 models include controls for each firm, only the 12 firms with fully  
19 observed changes in decoupling tell us anything about the effects  
20 of decoupling in the electric utility industry. Twelve studied units  
21 is a fairly small number for a panel study. Likewise, the 2014 gas  
22 model includes only 12 firms, but of these, only the 10 firms that  
23 we observed within the modeled data to experience a change in the  
24 degree of decoupling tell us anything about the effects of

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<sup>9</sup> Adolph, Exh. No. \_\_\_(CAA-1T), at page 29, line 11, through page 30, line 19; Hill, Exh. No. \_\_\_(SGH-2T), at page 96, lines 1-12.

<sup>10</sup> Dr. Adolph alludes to data “intentional or unintentionally ‘cherry picked’”. Adolph, Exh. No. \_\_\_(CAA-1T), at page 10, line 9. Although he does not say that The Brattle Group “cherry picked” the data, it would certainly be easy to check because we have reported our sources and data screens.

1 decoupling in the gas utility industry. Compared to other datasets  
2 studying a series of units through time, these are relatively small  
3 datasets, though not outside the range of published panel data  
4 studies. The relatively small sample creates the possibility of  
5 obtaining imprecise results even if decoupling has a real-world  
6 effect on the cost of capital. Nevertheless, despite its relatively  
7 small size, the current sample is sufficient to produce usable  
8 evidence about the effect of decoupling on the cost of capital, and  
9 does not alter my recommendations below.<sup>11</sup>

10 Despite the limited sample size and imprecision of the results, Dr. Adolph is  
11 prepared to make definitive conclusions about the results.

12 **Q. Does The Brattle Group make definitive conclusions in the decoupling**  
13 **reports?**

14 A. No. The Brattle Group was careful to be precise about the results in the reports.  
15 The Brattle Group was and is fully aware of the limitations of the studies as noted  
16 by Dr. Adolph. We were definitive that the results are not statistically significant  
17 at the standard confidence levels, but we noted the negative coefficient on the  
18 decoupling index variable. Although we used all available data and were careful  
19 in our analyses, we remain convinced that the results are not strong enough to  
20 justify a reduction in the cost of capital for a regulated entity. My conclusion is  
21 that more study and stronger statistical results would be required before  
22 concluding that the evidence was sufficient to reduce the allowed return on  
23 equity. As it stands, the null hypothesis that decoupling does not reduce the cost  
24 of capital cannot be rejected using standard confidence levels.

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<sup>11</sup> Adolph, Exh. No. \_\_\_(CAA-1T), at page 4, lines 6-22.



1 **Q. Do you agree with Dr. Adolph that academic journals do not generally**  
2 **publish studies with  $p$ -values greater than 0.10?**

3 A. Yes. In my experience, academic journals in economics and finance will only  
4 publish results which reach the standard levels of statistical significance.  
5 Although I cannot say with certainty that it never happens, I can say that it must  
6 be exceptionally rare because I do not recall seeing such an article in an academic  
7 journal of economics or finance.

8 **Q. Why do academic journals not publish such results?**

9 A. There may be many reasons, but among them is surely the belief that more study  
10 is required. Although there is some competition among academic journals to be  
11 the first to publish a new and interesting finding, there is also a concern for  
12 academic integrity and accuracy. As Dr. Adolph notes,<sup>12</sup> the journals may believe  
13 that further research will provide statistically significant results at conventional  
14 levels, but they may also fear that the results cannot and will not be supported by  
15 further research. In other words, they wish to avoid publishing something that  
16 turns out to be incorrect.

17 **Q. Do you think it valid to reverse the null hypothesis, as Dr. Adolph proposes?**

18 A. The natural null hypothesis is that decoupling does not reduce the cost of capital  
19 because many are claiming that it does. Regulators should want strong evidence  
20 to reduce the allowed return on equity for the regulated company. Reversing the

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<sup>12</sup> See Adolph, Exh. No. \_\_\_(CAA-1T), at page 20, lines 8-19.

1 null hypothesis as Dr. Adolph does<sup>13</sup> simply shows that the data is not precise  
2 enough to reject either version of the null hypothesis.

3 **Q. Why have you not commented on Dr. Adolph's statements on the**  
4 **implications of the *p*-values in the two Brattle reports?**

5 A. The Prefiled Rebuttal Testimony of Dr. Jeffrey A. Dubin, Exhibit No. \_\_\_(JAD-  
6 1T), addresses this and other issues regarding Dr. Adolph's statistical conclusions.  
7 The fact that I have not commented on all of Dr. Adolph's points in his testimony  
8 should not be construed as my agreement with them.

9 **III. RESPONSE TO THE PREFILED DIRECT TESTIMONY OF**  
10 **STEPHEN G. HILL AND THE PREFILED DIRECT TESTIMONY**  
11 **OF MICHAEL P. GORMAN**

12 **Q. What topics do you address in this section of your rebuttal testimony?**

13 A. In this section, I first address Mr. Hill's comments on my direct testimony with  
14 regard to The Brattle Group's decoupling studies. In particular, I focus on  
15 Mr. Hill's apparent confusion about what I actually say in my testimony and data  
16 requests. I also respond to issues raised by Mr. Gorman with respect to my direct  
17 testimony and the effect of decoupling on cost of capital. I then turn to a critique  
18 of Mr. Hill's estimate of the effect of decoupling on PSE's return on equity.

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<sup>13</sup> See Adolph, Exh. No. \_\_\_(CAA-1T), at page 22, line 13, through page 24, line 2.

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.<sup>14</sup>  
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  
9 the 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,<sup>15</sup> 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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<sup>14</sup> See, e.g., Hill, Exh. No. \_\_\_\_ (SGH-1T) at page 97, line 8, through page 103, line 11.

<sup>15</sup> See Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 91, lines 15-17.

1 variable rates; the updated gas LDC study did not consider lost revenue  
2 adjustment mechanism. The original electric utility study only considered true-up  
3 decoupling, but the update for this proceeding added straight-fixed variable rates  
4 for a single company, Commonwealth Edison, a subsidiary of Exelon Corp, which  
5 was already in the sample. We decided to include straight-fixed variable rates in  
6 the update to the electric study to make the gas LDC study and the electric study  
7 as similar as possible. Gas LDCs frequently use straight-fixed variable rates to  
8 “decouple” revenues from commodity sales, but electric utilities have straight-  
9 fixed variable rates only infrequently. Exhibit No. \_\_\_(MJV-8) shows that of the  
10 thirty states with any decoupling policy, nine states have straight-fixed variable  
11 rates. We also use multistage discounted cash flow estimates in the updated  
12 electric study.

13 **Q. Why did you transition to multistage discounted cash flow estimates in the**  
14 **electric study?**

15 A. We use multistage discounted cash flow estimates because we wanted to make the  
16 two studies as similar as possible. The gas LDC study was always based upon the  
17 multistage discounted cash flow estimates. We always intended to use multistage  
18 discounted cash flow estimates for the electric study, but our initial deadline  
19 precluded their use. Calculation of a constant growth discounted cash flow  
20 estimate is less complex than the multistage discounted cash flow.

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”<sup>16</sup> 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.<sup>17</sup> 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.<sup>18</sup>

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<sup>16</sup> Hill, Exh. No. \_\_\_(SGH-2T) at page 98, lines 16-18.

<sup>17</sup> Hill, Exh. No. \_\_\_(SGH-2T) at page 97, lines 19-20.

<sup>18</sup> Adolph, Exh. No. \_\_\_(CAA-1T), at page 26, lines 14-16.

1 **Q. Why did you not calculate a “decoupling index” for each of Dr. Morin’s**  
2 **sample companies as you did for the decoupling papers?**

3 A. Mr. Hill claims that my analysis of Dr. Morin’s sample “discards the more  
4 detailed ‘decoupling index’ analysis he used in his Brattle Group studies of  
5 decoupling.”<sup>19</sup> Substantial effort is required to calculate the decoupling index of  
6 a holding company. In the reports, we explained how we calculated the  
7 decoupling index, and we provided the detailed work papers for the decoupling  
8 indexes of electric and gas holding companies in those studies.

9 Although the decoupling index was necessary for The Brattle Group study, the  
10 purpose of the Exhibit No. \_\_\_(MJV-15) and Exhibit No. \_\_\_(MJV-16) was to  
11 simply provide information on the variety and types of alternative rate making  
12 policies in effect for subsidiaries of Dr. Morin’s proxy group that could  
13 potentially affect the cost of capital estimates. At a minimum, they represent  
14 differences in the regulatory treatment of companies in the sample.

15 **Q. How do you respond to Mr. Hill’s claim that Exhibit No. \_\_\_(MJV-15) is**  
16 **misleading because only a portion of the revenues for the companies shown**  
17 **on the exhibit are decoupled?**

18 A. Mr. Hill ignores the plain language in Exhibit No. \_\_\_(MJV-15) and in my  
19 prefiled direct testimony. Contrary to Mr. Hill’s assertion that a “company would  
20 appear in Dr. Vilbert’ list in Exhibit No. MJV-15 as fully decoupled,”<sup>20</sup> the Notes

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<sup>19</sup> Hill, Exh. No. \_\_\_(SGH-2T) at page 83, lines 8-9.

<sup>20</sup> Hill, Exh. No. \_\_\_(SGH-2T) at page 82, lines 11-12.

1 to Exhibit No. \_\_\_(MJV-15) explain that the exhibit shows the “[t]otal and  
2 percent of HCs (holding companies) where at least one state-regulated subsidiary  
3 has the policy.”<sup>21</sup> Nowhere in my testimony or in the exhibits did I state or imply  
4 that the list constituted “fully decoupled” companies.

5 **Q. Does the fact that the source of the cost of capital estimates used in the gas**  
6 **LDC study were from proceedings in which you or other witnesses from**  
7 **The Brattle Group submitted cost of capital testimony bias the study’s**  
8 **results, as Mr. Hill claims?**<sup>22</sup>

9 A. No. The fact that the source of the cost of capital estimates used in the gas LDC  
10 study were from proceedings in which I or other witnesses from The Brattle  
11 Group submitted cost of capital testimony does not bias the study’s results,  
12 although Mr. Hill certainly seems to have concerns to the contrary.<sup>23</sup>

13 Mr. Hill’s concern is misplaced. First, the vast majority of the estimates were  
14 done well before a paper on decoupling was considered. Second, the cost-of-  
15 capital estimates were submitted as part of cost of capital testimonies and were  
16 subjected to the normal regulatory scrutiny. The methodology applied to each  
17 sample company was identical. Third, even if Mr. Hill and I were to disagree  
18 about the appropriate magnitude of the return on equity for a regulated gas LDC,  
19 it is not the magnitude of the estimated return on equity that is important. It is the

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<sup>21</sup> Vilbert, Exh. No. \_\_\_(MJV-15) at page 1.

<sup>22</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 101, line 16, through page 102, line 2.

<sup>23</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 101, line 16, through page 102, line 2.

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."<sup>24</sup> 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"<sup>25</sup> 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.<sup>26</sup>

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<sup>24</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 103, line 23, through page 1.

<sup>25</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 104, line 5.

<sup>26</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 104, lines 7-11.



1 This is not an accurate representation of my testimony. I do not say that  
2 decoupling *could only* reduce diversifiable risk. I said that if the primary effect of  
3 decoupling was to reduce the portion of total risk that could otherwise be  
4 diversified, then there would be no effect on the cost of capital from the adoption  
5 of decoupling.<sup>27</sup> That is a conditional statement, not a categorical statement. This  
6 discussion was part of my attempt to explain why it is possible for the volatility of  
7 revenues to be decreased but not to observe a decrease in the cost of capital as  
8 was the case in the tests of decoupling performed by The Brattle Group.

9 Contrary to Mr. Hill's assertion, there is a substantial body of literature dealing  
10 with the reduction of total risk through formation of portfolio without affecting  
11 the expected return (i.e., the cost of capital). No one is suggesting that decoupling  
12 reduces the volatility of companies' stock returns to zero. I am simply suggesting  
13 that one explanation for the failure of The Brattle Group's tests to detect a  
14 statistically significant change in the cost of capital from decoupling could be that  
15 decoupling is reducing diversifiable risk.<sup>28</sup> The alternative explanation is that  
16 decoupling is simply offsetting an increase in risk imposed on the company by  
17 other policies.<sup>29</sup>

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<sup>27</sup> Vilbert, Exh. No. \_\_\_\_ (MJV-1T), at page 9, line 12, through page 12, line 4.

<sup>28</sup> Vilbert, Exh. No. \_\_\_\_ (MJV-1T), at page 9, line 12, through page 12, line 4.

<sup>29</sup> Vilbert, Exh. No. \_\_\_\_ (MJV-1T), at page 12, lines 5-20.

1 **Q. Do you believe that decoupling policies cannot affect a regulated company's**  
2 **stock price?**

3 A. No. In my direct testimony, I noted that the cost of capital is determined in  
4 capital markets and is not directly based upon accounting variables such as  
5 revenues.<sup>30</sup> Mr. Gorman suggests that I mean to say that decoupling could not  
6 affect stock prices,<sup>31</sup> but that is incorrect. I am saying that whatever effect  
7 decoupling has on the cost of capital, the effect must be measured in the capital  
8 markets by the effect on the returns of the company's stock. Moreover, as noted  
9 above, if there is an effect from decoupling on the cost of capital, it is most likely  
10 to affect the company's stock price. It is not measured by accounting variables.

11 **Q. What is Mr. Gorman's argument about the U.S. Supreme Court's decisions**  
12 **in *Hope* and *Bluefield*?**

13 A. Mr. Gorman says:

14 [T]he *Hope* and *Bluefield* decisions did not allow for a reduced  
15 return on equity if company-specific risk can be diversified away if  
16 that stock is held in a diversified portfolio. As such, from a  
17 practical point of view, a fair and reasonable return on equity must  
18 consider the stability and predictability of a utility's earnings,  
19 dividends and cash flows in assessing the investment risk of the  
20 enterprise.<sup>32</sup>

21 In my understanding of these decisions, the Supreme Court is saying that the  
22 regulated company should be offered a fair opportunity to earn its cost of capital,

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<sup>30</sup> Vilbert, Exh. No. \_\_\_(MJV-1T), at page 9, lines 14-22.

<sup>31</sup> Gorman, Exh. No. \_\_\_(MPG-23T), at page 61, lines 18-21.

<sup>32</sup> Gorman, Exh. No. \_\_\_(MPG-23T), at page 63, lines 4-9.

1 which is measured relative to other companies of comparable risk. By definition,  
2 the cost of capital excludes risks that are diversifiable. Customers should not  
3 have to pay a higher return because a portion of a stock's return is diversifiable,  
4 nor should customers expect to pay less than the cost of capital. When estimating  
5 the cost of capital, the "stability and predictability of a utility's earnings,  
6 dividends and cash flows"<sup>33</sup> are certainly part of the market's evaluation that  
7 results in the estimated cost of capital. It would be inappropriate to reduce the  
8 estimated cost of capital further because the market has already considered all  
9 factors including the stability of cash flows.

10 **Q. Does Mr. Hill object to your second possible explanation for the observed**  
11 **results of The Brattle Group tests (i.e., that decoupling is simply offsetting an**  
12 **increase in risk imposed on the company by other policies)?**

13 A. Yes. Mr. Hill takes exception with my explanation that there is no statistically  
14 significant effect on cost of capital as a result of the implementation of decoupling  
15 because decoupling is instituted as a policy response to support other important  
16 regulatory goals that may increase risk to utilities under traditional cost of service  
17 regulation. Mr. Hill states as follows:

18 In response to discovery, he states that neither he nor the Brattle  
19 Group have performed any analysis of the degree to which energy  
20 efficiency programs increase utility investment risk. He also  
21 states, in response to ICNU Data Request No. 02.19 that he is "not

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<sup>33</sup> Gorman, Exh. No. \_\_\_(MPG-23T), at page 63, lines 7-8.

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asserting that state energy efficiency policies increase risk for utilities.<sup>34</sup>

In his testimony, Mr. Hill misrepresents my response to a discovery request. The full response to ICNU Data Request No. 02.19 reads as follows:

In the cited section of Dr. Vilbert’s testimony, he is providing a possible explanation for the failure to reject the null hypothesis that there is no statistically significant effect on the cost of capital from the adoption of decoupling. Dr. Vilbert is not “asserting that state energy efficiency policies increase risk for utilities” although he believes that the statement is likely to be true. Instead he is offering one explanation for the empirical result in the test of the effect of decoupling on the cost of capital. In Dr. Vilbert’s view, the assertion that decoupling must reduce risk and therefore the cost of capital neglects to consider the reasons that decoupling was adopted in the first place. As noted on p. 32, lines 15-17 of Dr. Vilbert’s testimony, “decoupling is instituted as a policy response to support other important regulatory goals that may increase risk to utilities under traditional cost of service regulation.”<sup>35</sup>

I understand the word “assert” to mean to claim the truth of a statement without any proof. Consequently, I denied that I had “asserted” that policies such as energy efficiency programs, distributed generation, DSM, and connecting renewable energy sources to the grid increased the risk to the regulated electric company. I believe it to be true, but I have not done an empirical study of the issue that would let me say so definitively. One possible reason that these programs may increase the risk of the regulated electric utility is that these programs all share the goal of reducing the consumption of energy and consequently the utility’s sales. As a result, the utility is likely to have increasing

<sup>34</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 105, lines 8-12.

<sup>35</sup> PSE’s Response to ICNU Data Request No. 02.19, a copy of which is provided as Exhibit No. \_\_\_(MJV-21).

1 rates due to increased investment as well as due to declining sales. This  
2 circumstance is likely to increase the risk to the utility, absent a policy like  
3 decoupling.

4 **Q. What is your conclusion in this portion of your prefiled rebuttal?**

5 A. None of the criticisms of The Brattle Group decoupling studies or my direct  
6 testimony are valid, as I have explained above.

7 **B. Mr. Hill Asserts but Does Not Demonstrate in Any Way that the**  
8 **Reduction in Volatility in Revenues Due to Decoupling is Related to**  
9 **the Cost of Capital.**

10 **Q. Does Mr. Hill propose and implement a method to estimate quantitatively the**  
11 **effect of decoupling on the cost of capital?**

12 A. Yes. Mr. Hill purports to provide empirical analyses for the effect of decoupling  
13 on the cost of capital.<sup>36</sup> I will show that this analysis is deeply flawed both  
14 theoretically and empirically. I first review the underlying theory of Mr. Hill's  
15 analysis and demonstrate that his analysis mixes some valid financial theory with  
16 misleading assumptions and analogies. I then review the steps in Mr. Hill's  
17 quantitative analysis and explain why his calculations are completely inadequate  
18 as a quantitative, factual measure of the effect of decoupling on the cost of capital.

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<sup>36</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 106, line 21, through page 123, line 17.

1 These analyses are flawed because Mr. Hill relies entirely on net revenues.<sup>37</sup>  
2 There is a disconnect with the basic theory of finance because he uses net revenue  
3 instead of using returns on financial assets. He could even have used net income  
4 which was in the data set that he used. This would have been more consistent  
5 with finance theory than net revenues, but he chose to ignore this data. There is  
6 obviously a considerable difference between net revenues and net income, starting  
7 with the fact that all operating costs must be subtracted from net revenues before  
8 you have operating earnings, then taxes and interest expenses are subtracted to get  
9 net income.

10 In 2009, Mr. Hill testified on the same issues in the Bay State Gas Company's  
11 application to the Massachusetts Department of Public Utilities.<sup>38</sup> In his rebuttal  
12 testimony he explains as follows:

13 Q. You note that your analysis is based on the historical volatility  
14 of Bay State's net revenues. How do you respond to  
15 Mr. Hevert's concerns that you should have analyzed the  
16 Company's net income volatility?

17 A. While, theoretically, the analysis of the impact of decoupling  
18 can be performed using historical net income volatility if the  
19 factors that impact net income (operating costs, depreciation,  
20 taxes, interest expense, write offs) are relatively constant over  
21 time, it is not often the case that those operating factors are

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<sup>37</sup> Net revenue as used in Mr. Hill's testimony is defined as total revenue *minus* fuel and purchased power costs, which are recovered through balancing accounts. This distinction is found in the data set that Mr. Hill obtained from PSE in this proceeding in PSE's Response to Public Counsel Data Request No. 006, cited in Exhibit No. \_\_\_(SGH-19), at page 1.

<sup>38</sup> *In re Petition of Bay State Gas Co.*, Docket DPU 09-30, Order (Oct. 30, 2009). Testimony of Stephen G. Hill, on behalf of the Attorney General for the Commonwealth of Massachusetts, before the Department of Public Utilities, Bay State Gas Company, Docket No. 09-30, June 30, 2009. Rebuttal Testimony of Stephen G. Hill, on behalf of the Office of the Attorney General, for the Commonwealth of Massachusetts, before the Department of Public Utilities, Bay State Gas Company, Docket, No. 09-30, July 27, 2009.

1 stable over time. For example, in Bay State's case, over the  
2 past ten years, the Miscellaneous Income Deductions that  
3 appear on its income statement, range from +\$1.9 Million  
4 (2001) to -\$63.4 Million (2008-related to the divestiture of  
5 Northern Utilities). Also, decoupling will not eliminate those  
6 additional variables that impact a utility's net income.  
7 Therefore, discerning the reduction in the volatility of net  
8 income due to the application of decoupling is a less accurate  
9 process that using net revenues. For that reason, I have  
10 analyzed the historical net revenues of Bay State Gas  
11 Company, not its net income.<sup>39</sup>

12 This is a revealing statement of Mr. Hill's thinking on the issues of this case. Net  
13 income, while still an accounting variable, is more relevant to investors and their  
14 perception of the risk of a company than net revenues for the reasons that Mr. Hill  
15 states. The costs incurred must be taken out and they are expressly said to be  
16 variable, but Mr. Hill comes to the astounding conclusion that the costs should  
17 therefore be ignored. His volatility measurement, which he will apply directly to  
18 the cost of equity capital, must be measured by the simpler net revenue volatility.

19 **Q. Is there another difference between net income and systematic, non-**  
20 **diversifiable market returns on financial assets to shareholders?**

21 A. Yes. The cost of capital is determined in capital markets, and returns in capital  
22 markets are what financial theory clearly shows determine the cost of equity  
23 capital. This gap between net revenue volatility and the systematic volatility of  
24 market returns is discussed in depth below and demonstrates Mr. Hill's proposed  
25 measure of reduction in cost of equity capital from decoupling has no basis.

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<sup>39</sup> Rebuttal Testimony of Stephen G. Hill, on behalf of the Office of the Attorney General, for the Commonwealth of Massachusetts, before the Department of Public Utilities, Bay State Gas Company, Docket, No. 09-30, July 27, 2009, at page 14, lines 10-23.

1 **Q. Do you have other concerns with Mr. Hill's analysis of the effect of**  
2 **decoupling on PSE's cost of capital?**

3 A. Yes. Mr. Hill greatly overstates that net revenues affected by PSE's decoupling  
4 mechanisms. PSE's approved decoupling policy only trues up the distribution  
5 and transmission costs and excludes the large fixed power costs, which Mr. Hill  
6 fails to consider, as well as the fuel and purchased power costs that he does  
7 consider. Mr. Hill uses net revenue values for 2013 of \$2.23 billion (from Exhibit  
8 No. \_\_\_(SGH-19)). PSE's public decoupling filings for electric and gas for rate  
9 year May 1, 2013 through April 30, 2014 total \$787 million.<sup>40</sup> Thus, Mr. Hill is  
10 using the wrong revenue data, and his measurement of the revenue volatility—  
11 which I otherwise take issue with—will also be incorrect due to his failure to use  
12 the correct revenue values.

13 **Q. Has Mr. Hill submitted similar testimony in other proceedings?**

14 A. Yes. I know of at least two proceedings. The most recent was in Hawaii on  
15 behalf of the Consumer Advocate. In that proceeding, his testimony was nearly  
16 identical to that in this proceeding, with the exception that he assumed decoupling  
17 reduced revenue volatility by 40 percent instead of the 35 percent he uses here.  
18 As discussed above, Mr. Hill also submitted testimony before the Massachusetts  
19 Department of Public Utilities in Docket DPU 9-30 on behalf of the  
20 Massachusetts Attorney General.

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<sup>40</sup> Puget Sound Energy, Decoupling Filing, Development of Delivery Cost Energy Rate and Schedule 139 Rate – Electric, Rate Year - May 1, 2013 through April 30, 2014. Tab: JAP-18, page 1. Puget Sound Energy, Decoupling Filing, Development of Delivery Cost Energy Rate and Rate Change - Natural Gas, Rate Year - May 1, 2013 through April 30, 2014, Tab: JAP-19, page 1.



1 **Q. Did the Massachusetts Department of Public Utilities comment on Mr. Hill's**  
2 **methodology?**

3 A. Yes. In that case, the Attorney General for the State of Massachusetts  
4 recommended a 50 basis point reduction in Bay State Gas Company's return on  
5 equity to account for the reduction in operating risk afforded by a decoupling  
6 mechanism, supported by the testimony of Mr. Hill, cited above. To estimate the  
7 risk reduction, Mr. Hill conducted an analysis very similar to his submission in  
8 this docket. He estimated the degree of fluctuations in Bay State Gas Company's  
9 net revenues, due to changes in weather (heating degree days) and the economy,  
10 measured by the Massachusetts Gross State Product, using data from 1999 to  
11 2008. However, the Order issued by the Massachusetts Department of Public  
12 Utilities observed the following:

13 Because of the many methodological deficiencies in the Attorney  
14 General's method for establishing the historical relationship  
15 between the variations in net revenues due to changes in weather  
16 and the economy, such as the quality of data used and statistical  
17 problems relating to auto-correlations, we cannot place any  
18 significant weight on the results of her analysis and  
19 recommendation.<sup>41</sup>

20 Moreover, the Order stated as follows:

21 As stated above, we deny the Attorney General's 50-basis-point  
22 reduction because we are not persuaded that this is an accurate  
23 *quantification of the change in investors' risks perception*  
24 associated with Bay State's implementation of revenue  
25 decoupling.<sup>42</sup>

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<sup>41</sup> *In re Petition of Bay State Gas Co.*, Docket DPU 09-30, Order at page 369.

<sup>42</sup> *In re Petition of Bay State Gas Co.*, Docket DPU 09-30, Order at page 372.

1 As noted above, this unpersuasive attempt to quantify the effect of decoupling  
2 was undertaken by Mr. Hill on behalf of the Massachusetts state Attorney  
3 General, and it is the same faulty analysis used by Mr. Hill in this case.

4 **Q. Before you analyze the steps in Mr. Hill’s model, please review the financial**  
5 **theory underlying his approach.**

6 A. In this part of his testimony, Mr. Hill mixes statements that are consistent with  
7 financial theory, statements that are consistent under certain restrictions, and  
8 statements which superficially sound good but are not consistent with financial  
9 theory. I will attempt to untangle the long development of Mr. Hill’s argument,  
10 which runs seventeen pages.<sup>43</sup> In my comments that follow, I focus on accepted  
11 financial theory.

12 Mr. Hill says that “[t]he risk of investing in any asset is directly related to the  
13 possibility that actual, realized returns will deviate from expected returns.”<sup>44</sup> This  
14 is true if the returns being referenced are those in capital markets. The cost of  
15 capital is measured in capital markets, not by accounting variables such as net  
16 revenue.<sup>45</sup> Mr. Hill’s analyses in the cost of capital portion of his testimony do  
17 not rely upon net revenues (an accounting value) as he does in this part of his  
18 testimony.

19 Mr. Hill then says the following:

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<sup>43</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 106, line 21, through page 123, line 17.

<sup>44</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 107, lines 6-7.

<sup>45</sup> Financial analysts review accounting statements, and their assessments utilize information extracted from accounting statements, but accounting values are not a substitute for the actual financial market values in calculating the cost of equity capital and debt capital.

1 The greater the potential for actual returns to deviate from  
2 expected returns, the higher the risk. Conversely, the more certain  
3 an investor can be that the returns expected will be realized, the  
4 lower the risk.<sup>46</sup>

5 Both statements are true for *total risk*, but the cost of capital for an investment  
6 will only be reduced if the risk reduced in the second statement is systematic risk.  
7 Systematic risk, not diversifiable risk is the risk that affects the cost of capital.<sup>47</sup>

8 **Q. What is the difference between systematic risk, sometimes called market risk,  
9 and non-systematic risk, sometimes called diversifiable risk?**

10 A. The total risk of an investment can be divided into systematic risk and non-  
11 systematic. Total risk of an asset is its total variance (i.e., the volatility) of its  
12 return as measured in capital markets. The risk of the asset that cannot be  
13 diversified away when the asset is held in a well-diversified portfolio is the asset's  
14 systematic risk or market risk. Because it cannot be avoided by an investor, this  
15 is the risk that affects the cost of capital. Investors do not expect to be  
16 compensated for an asset's diversifiable risk (i.e., non-systematic risk) because it  
17 can be avoided through diversification. Mr. Hill acknowledges this distinction.<sup>48</sup>

18 Mr. Hill says that “[o]ne measure of the risk of a financial asset, then, is the  
19 volatility or variability of the income stream it generates.”<sup>49</sup> This may be one  
20 measure, but it is not the standard measure of risk in cost of capital theory.

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<sup>46</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 107, lines 7-10.

<sup>47</sup> Systematic risk applies to all types of investments including debt, but Mr. Hill analysis is focused on the cost of equity.

<sup>48</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 112, line 19, through page 113, line 2.

<sup>49</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 107, lines 11-12.

1 Certainly, income is important to an investor, but the variability of that income  
2 with regard to the cost of capital depends upon whether and how the variability  
3 results in fluctuation in the asset's returns that is diversifiable or not.

4 Mr. Hill then says that

5 [t]he fact that the volatility of a financial asset is directly related to  
6 its investment risk is neither controversial nor difficult to  
7 comprehend, and that concept is fundamental to this method of  
8 assessing the risk impact of decoupling.<sup>50</sup>

9 Of course, this is true if he is referring to the volatility of the capital market  
10 returns on the asset, but he has shifted from a focus on net revenues for a  
11 regulated company to the returns in capital markets, without any consideration of  
12 the critical steps from revenues to market returns. Volatility of net revenue is not  
13 the same as volatility of capital market returns.

14 **Q. What are the steps from revenues to market returns?**

15 A. In simple terms, net income (i.e. profit)<sup>51</sup> is revenues *minus* costs, and clearly net  
16 income is more important to investors than revenues. For example, if revenues  
17 increase but by less than costs, net income is lower and vice versa. Some  
18 volatility in income is the result of diversifiable risk such as weather so would not  
19 affect the cost of capital. Net income affects market price of equity, but it is one  
20 of many things that affect market prices such as expectations regarding future  
21 prospects of the company, the state of the economy, etc. It is not “intuitively

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<sup>50</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 109, lines 4-7.

<sup>51</sup> Net income is calculated by taking revenues and adjusting for the cost of doing business, depreciation, interest, taxes and other expenses. In contrast operating income is revenues minus cost of goods sold. In other words, it is before interest, taxes and other expenses.

1 obvious”<sup>52</sup> what the effect on market returns will be from a reduction in volatility  
2 of revenues. To be clear, I am not saying that decoupling will have no effect on  
3 the volatility of net income, rather the size and nature of the effect cannot be  
4 assumed to be one to one. The reduction of volatility of net income is likely to be  
5 smaller than for reduction in volatility of revenues, and it is net income volatility  
6 that is the more important factor.

7 **Q. How does Mr. Hill use this series of statements to try to make his case?**

8 A. Mr. Hill says that “it is intuitively obvious that the more the utility’s revenue  
9 volatility is eliminated by decoupling, the greater the risk reduction caused by  
10 decoupling and the lower the allowed equity return should be.”<sup>53</sup> In general, this  
11 is false. It is only true if the facts of the situation show it to be true. It cannot  
12 simply be assumed to be true, as Mr. Hill does. To repeat: the change in the cost  
13 of capital depends upon changes in the volatility of returns in capital markets, not  
14 the volatility of net revenues alone. This is fatal for Mr. Hill’s analysis because  
15 he only attempts to measure the volatility of net revenues. The reader is asked to  
16 assume that a reduction in volatility in net revenues automatically translates into a  
17 one to one reduction in the cost of capital.

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<sup>52</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 110, line 5.

<sup>53</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 110, lines 5-8.

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.<sup>54</sup> 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.<sup>55</sup>

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,<sup>56</sup> not the absolute values in the years. This R-  
11 squared<sup>57</sup> 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 percent.<sup>58</sup>

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<sup>54</sup> Mr. Hill uses revenues net of fuel cost adjustment and the costs of purchase power because these costs are passed through.

<sup>55</sup> Hill, Exhibit No. \_\_\_\_ (SGH-19), at page 1 (providing an R-Squared = 0.902910203).

<sup>56</sup> First differences are calculated as this period's value minus last period's value. This is done for each period in the study.

<sup>57</sup> 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.

<sup>58</sup> 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.

1 Second, Mr. Hill offers no evidence of its accuracy in measuring the amount of  
2 variability of revenues that PSE's decoupling policy is expected to reduce. For  
3 example, decoupling is generally known to reduce weather-induced revenue  
4 volatility, but in Mr. Hill's equation, the Heating Degree Days explanatory  
5 variable has an insignificant coefficient,<sup>59</sup> so it adds little explanatory power.

6 In his second step, Mr. Hill uses judgment to lower the 90 percent reduction in  
7 revenue variability to about 50 percent and proceeds with that value in his  
8 analysis.<sup>60</sup> Mr. Hill says this adjustment makes his further analysis conservative,  
9 but he admits it is judgment, so the first step regression is not really needed.

10 **Q. Why do you say that Mr. Hill's equation explaining the change in PSE's net**  
11 **revenues tells us nothing about the net revenue variability reduction from**  
12 **decoupling?**

13 A. The effect of decoupling on net revenues depends upon the decoupling policy  
14 which does not address directly either the Washington Gross State Product or the  
15 heating degree-days of the year. Decoupling with true-up compares the target  
16 revenues collected over the period of a year to the revenues collected over that  
17 period. If revenues are lower than forecast, a surcharge is added to rates  
18 (i.e., revenues) for the next period to adjust for the under recovery of target  
19 revenues in the previous period. If sales collect revenues that are higher than  
20 forecast, a credit is added to rates (i.e., revenues) for the next period to adjust for

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<sup>59</sup> See Hill, Exh. No. \_\_\_(SGH-19), at page 1. This is shown in the coefficient and std. error of variable X2, HDD.

<sup>60</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 113, lines 9-13.

1 the over recovery of fixed costs in the previous period. Net revenues will still  
2 vary but it is expected to be by a reduced amount based upon how accurate the  
3 forecast of sales used to set rates may be and how rapidly any over or under  
4 recovery is transferred to customers.

5 **Q. What is Mr. Hill's second step?**

6 A. Mr. Hill assumes that decoupling will reduce the volatility of revenues by  
7 50 percent.<sup>61</sup> He explains this assumption as “reasonable to be cautious” about  
8 using the 90 percent for several reasons.<sup>62</sup> First, he questions his use of linear  
9 regression.<sup>63</sup> Second, he justifies the assumption that decoupling reduces the  
10 volatility of revenues by 50 percent by reference to the fact that some risks are  
11 diversifiable.<sup>64</sup> However, whether some risks are diversifiable or not at this point  
12 has nothing to do with how the decoupling mechanism affects net revenue. By its  
13 design, decoupling is intended to reduce the volatility of a regulated utility's  
14 revenues. Whether the amount that the volatility is reduced is higher or lower  
15 than 50 percent, the true reduction does not really depend upon his first step  
16 regression. From this point forward, Mr. Hill is thus working with an assumed  
17 amount of revenue volatility reduction that has no analytical basis.

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<sup>61</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 113, lines 9-13.

<sup>62</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 112, lines 10-13.

<sup>63</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 112, lines 14-18.

<sup>64</sup> Hill, Exh. No. \_\_\_\_ (SGH-2T), at page 112, line 19, through page 113, line 13.



1 **Q. What is his third step?**

2 A. Mr. Hill reduces the now assumed amount that decoupling reduces PSE's revenue  
3 volatility to 35 percent by suggesting that the amount that PSE's revenue  
4 volatility could be reduced depends also on the market-weighted average of the  
5 companies in his cost of capital sample located in jurisdictions with decoupling.<sup>65</sup>  
6 The calculation is 50% times (100% minus 28.5%) = 35.75%, rounded to  
7 35 percent.<sup>66</sup> However, the use of this market-weighted average to reduce the  
8 volatility of revenues in the state of Washington makes no sense.

9 **Q. Why do you say that Mr. Hill's third step makes no sense?**

10 A. Mr. Hill does not discuss—and I cannot discern—any direct, quantitative link  
11 between the share of decoupling policies in the states of the companies in  
12 Mr. Hill's cost of capital sample, which in theory can affect their own revenue  
13 volatility, and the reduction of volatility of PSE's net revenues due to decoupling  
14 in the state of Washington. If Mr. Hill has a link in mind, he did not reveal it in  
15 his testimony.

16 **Q. Are you saying that the number of other companies in the cost of capital**  
17 **sample with decoupling is irrelevant to estimating the effect of decoupling on**  
18 **PSE?**

19 A. No. These companies are not connected to Mr. Hill's analysis of net revenue  
20 volatility for PSE, but they are related to the discussion of PSE's cost of capital. I

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<sup>65</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 113, line 14, through page 114, line 14.

<sup>66</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 114, lines 11-12.

1 believe it is critical to recognize that some of the companies in Dr. Morin's,  
2 Mr. Gorman's, and Mr. Hill's samples also have decoupling. This means that  
3 whatever effect decoupling may have on the cost of capital is already reflected in  
4 the return on equity estimates for those sample companies. It would be double-  
5 counting to reduce PSE's allowed return on equity based upon a sample that also  
6 consists of some companies with decoupling. But back to Mr. Hill's third step,  
7 decoupling in Mr. Hill's sample has nothing to do with the reduction in the  
8 volatility of PSE's revenues in Washington due to decoupling. Mr. Hill's sample  
9 and his estimate of the cost of equity play no further role in his discussion of the  
10 impact of decoupling.

11 **Q. What is Mr. Hill's fourth step in his analysis?**

12 A. Mr. Hill focuses on the change in the third standard deviation of revenues with  
13 and without decoupling. He estimates that decoupling reduces the probability of  
14 extreme negative net revenue events by 0.65 percent.<sup>67</sup> He then asserts that

15 investors would be indifferent between 'traditional' regulation and  
16 revenue decoupling if the equity return under decoupling produced  
17 a revenue requirement 0.65 percent less than that under  
18 "traditional" regulation.<sup>68</sup>

19 To quantify the effect on an investor in PSE, he assumes that PSE's net revenues  
20 should be reduced by 0.065 percent of the average net revenues over the past

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<sup>67</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 120, lines 9-12; *see also* Hill, Exh. No. \_\_\_(SGH-19), at page 4.

<sup>68</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 120, lines 12-15.

1 fifteen years \$1.529 billion per year, or about \$9.9 million.<sup>69</sup> This amount is then  
2 translated into 33.5 basis points of the 15-year average level of equity capital of  
3 PSE.<sup>70</sup>

4 **Q. With respect to Mr. Hill's assumed 35 percent reduction in revenue**  
5 **volatility, can you show this concept visually?**

6 A. Yes. Mr. Hill assumes that net revenues are normally distributed both before and  
7 after decoupling. Recall that a normal distribution has a shape like a bell and is  
8 sometimes called a bell curve. This curve is displayed in Mr. Hill's testimony in  
9 Chart VIII (Revenue Distribution Under Traditional Regulation).<sup>71</sup> He notes that  
10 if the expected revenues remain the same, but the volatility is decreased, the bell  
11 shape would be narrower and taller in the middle.<sup>72</sup>

12 **Q. Can you show the 35 percent reduction is arbitrary and Mr. Hill could just**  
13 **as well posed a completely different concept as plausible**

14 A. Yes, the actual reduction of bad (and good) outcomes is much larger than  
15 measured by the change in the third standard deviation (the "- 3 sigma change").  
16 It is the entire area under the traditional regulation curve in Mr. Hill's Chart IX  
17 ("Revenue Distribution Differential With Decoupling") to the right and left of the

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<sup>69</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 121, lines 3-15; *see also* Hill, Exh. No. \_\_\_(SGH-19), at page 4.

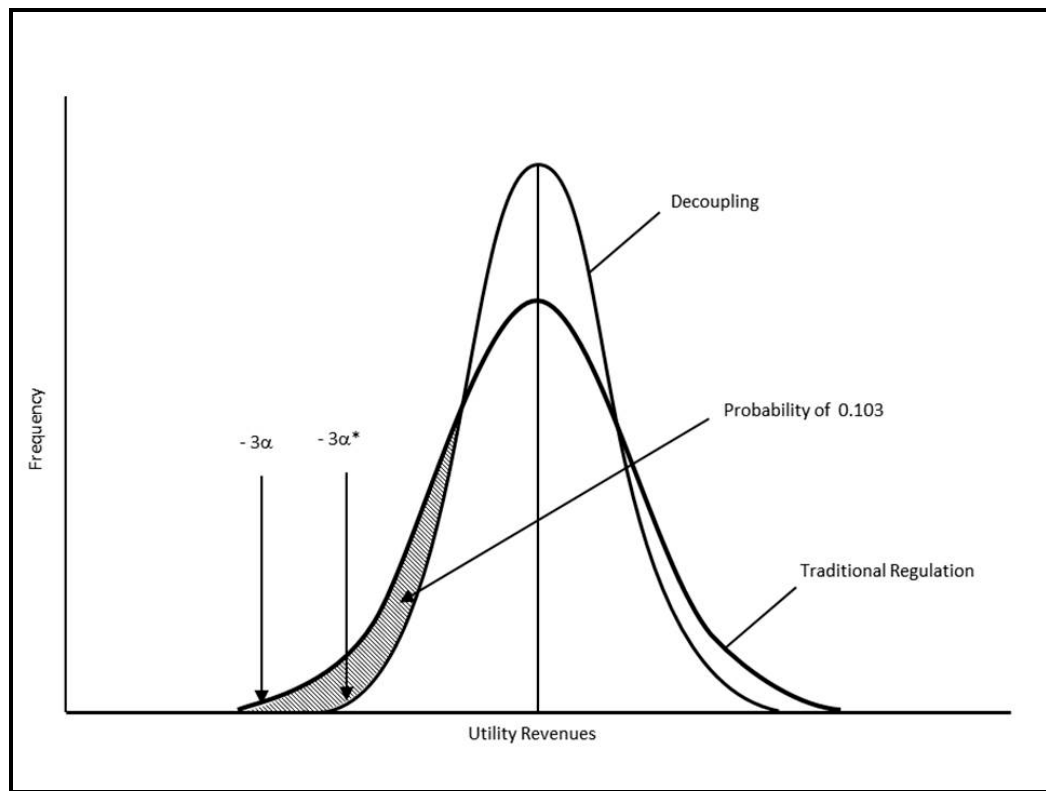
<sup>70</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 121, line 16, through page 122, line 7; *see also* Hill, Exh. No. \_\_\_(SGH-19), at page 4.

<sup>71</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 118, Chart VIII (Revenue Distribution Under Traditional Regulation).

<sup>72</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 119, Chart IX (Revenue Distribution Differential With Decoupling).

1 intersections of the distribution. The graph is reproduced below. If investors care  
2 about negative revenue events as Mr. Hill suggests, they would also care about  
3 negative events that do not reach the magnitude of minus three sigmas. As can  
4 easily be seen, the reduction of both good and bad outcomes is much larger than  
5 the portion measured by the third standard deviation. The shaded area shows the  
6 reduction in bad outcomes relative to the assumed original distribution. The  
7 corresponding area to the right of the center line represents the favorable  
8 outcomes that would be foregone by the investor under decoupling.

**Figure 1. Revenue Distribution Differential With Decoupling**



1 **Q. Please summarize your overall criticisms of Mr. Hill's empirical**  
2 **quantification of the impact of decoupling on a regulated company's cost of**  
3 **equity capital?**

4 A. First, Mr. Hill focuses on volatility of net revenues. This is an accounting value.  
5 The cost of capital is measured in capital markets using returns on investments,  
6 not on published accounting variables such as net revenue. This is why the cost-  
7 of-capital estimation methodologies rely upon market data not accounting data.  
8 Mr. Hill had access to information on the net income of PSE and could have more  
9 properly focused on net income in his decoupling analysis. Revenues are related  
10 to net income, but they are not the same, and net income is not the same as returns  
11 to an investment in stock or other asset. Mr. Hill's cost of capital studies rely  
12 upon capital market data; his decoupling analysis should also focus upon capital  
13 market data.<sup>73</sup> It is the volatility of investment returns that is related to the cost of  
14 capital, not the volatility of net revenues.

15 **Q. What is the second part of your criticism?**

16 A. Second, I agree that the volatility of revenues is likely to be reduced by  
17 decoupling. That is, of course, its purpose.<sup>74</sup> Mr. Hill's calculation assumes that  
18 the utility's revenue volatility is reduced by 35 percent, but Mr. Hill ignores the  
19 fact that the reduction in volatility removes portions of both of the tails of the  
20 distribution. In other words, if revenues are normally distributed with and without

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<sup>73</sup> The Brattle Group studies on the effect of decoupling relied upon capital market data.

<sup>74</sup> Whether the reduction is of the magnitude assumed in Mr. Hill's testimony (35 percent) is not relevant to the discussion

1 decoupling as Mr. Hill assumes, not only does decoupling remove some of the  
2 downside risk for revenues, it also removes the corresponding upside for  
3 revenues. In fact for a normal distribution, the downside loss avoided is exactly  
4 equal to the upside gain that is prevented because the distribution is symmetrical.  
5 In expected value, the investor would give up positive returns exactly equal to the  
6 losses prevented.

7 **Q. What is your third criticism?**

8 A. Third, Mr. Hill never explains why three standard deviations are relevant to the  
9 effect on the cost of capital as compared to two standard deviations or any other  
10 number. If his theory is that investors don't like negative outcomes, that dislike is  
11 not limited to highly unlikely events restricted to three standard deviations. For  
12 example, if he had calculated the effect assuming that investors dislike negative  
13 events of two standard deviations or more, his calculated effect on the cost of  
14 equity would have been much greater.

15 **Q. How large would Mr. Hill's adjustment to revenue have been if Mr. Hill had  
16 provided a quantification of the effect on return on equity consistent with his  
17 own theory?**

18 A. The shaded portion of Figure 1 above represents all of the probability of avoiding  
19 the lower returns from a probability distribution with a 35 percent reduction in its  
20 standard deviation. This area is consistent with the view that investors dislike all  
21 negative outcomes. The shaded probability area under the curve is 10.3 percent  
22 not the 0.65 percent calculated from the difference in three standard deviations.  
23 This represents a reduction in return on equity of 5.29 percent using Mr. Hill's

1 methodology.<sup>75</sup> 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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<sup>75</sup> 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.

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.<sup>76</sup> Figure 2 below is reproduced from *Principles of Corporate Finance*,  
5 10<sup>th</sup> edition, by Brealey, Myers and Allen.<sup>77</sup> 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.

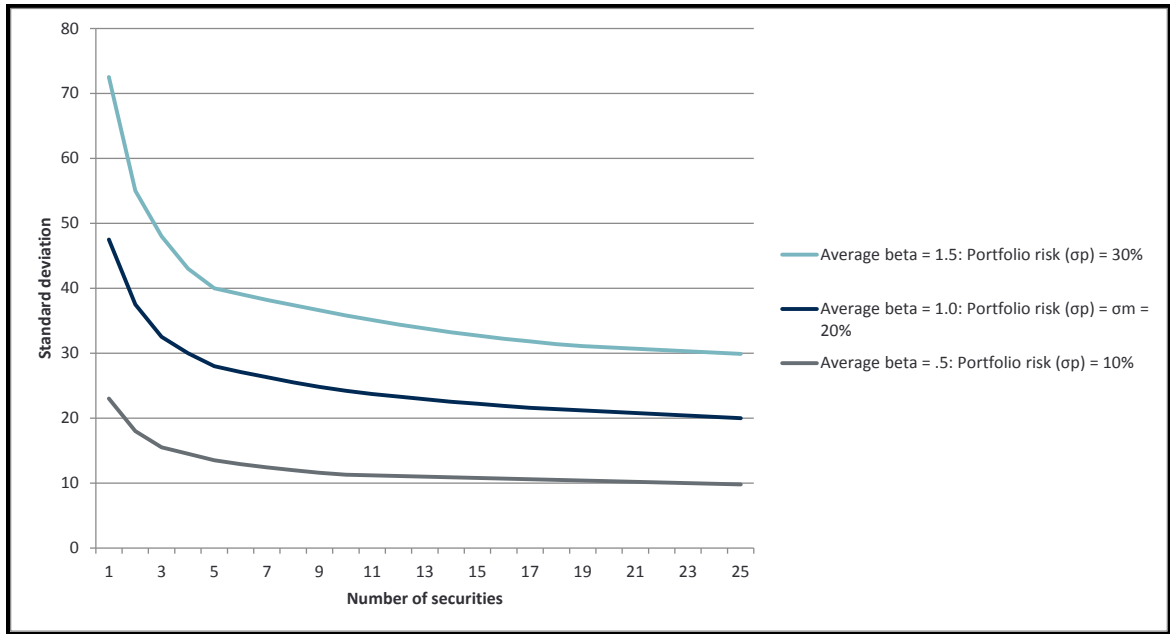
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<sup>76</sup> For example, see Chapter 7, “Introduction to Risk and Return”, in Brealey, Myers and Allen, *Principles of Corporate Finance* (10<sup>th</sup> ed. 2011).

<sup>77</sup> *Principles of Corporate Finance* at page 173.



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



1 Portfolio theory directly contradicts Mr. Hill's assertion<sup>78</sup> 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,<sup>79</sup> 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

<sup>78</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 120, lines 12-15.

<sup>79</sup> Hill, Exh. No. \_\_\_(SGH-2T), at page 32, lines 8-13.

1 reduction in the cost of capital depends critically on the type of risk that is  
2 reduced. Financial theory holds that reducing the cost of capital depends upon  
3 reducing systematic risk.<sup>80</sup> If some or most of the risk reduced by decoupling is  
4 diversifiable risk, there would be little or no reduction in the cost of capital even  
5 though total risk has been reduced. On the other hand, if decoupling simply  
6 offsets the increased systematic risk from policies encouraging energy  
7 conservation and renewable energy integration, there would be no measureable  
8 effect on the cost of capital, either. Although Order 07 in this proceeding<sup>81</sup> does  
9 not have a discussion of risk similar to mine, the Commission states the purposes  
10 of decoupling in a way consistent with my statements here:

11 *The decoupling mechanisms we approve mean that PSE's recovery*  
12 *of the fixed costs it incurs for infrastructure and operations*  
13 *necessary to deliver power and natural gas will no longer depend*  
14 *on the amounts of electricity and natural gas the company sells.*  
15 *This removes the so-called throughput incentive, thus promoting*  
16 *PSE's more aggressive pursuit of cost-effective conservation to*  
17 *which it commits as part of the decoupling mechanisms. With the*  
18 *throughput incentive eliminated, the company will be indifferent to*  
19 *the loss of sales as the result of the success of its conservation*  
20 *efforts.*<sup>82</sup>

21 **Q. Please summarize your review of Mr. Hill's decoupling study.**

22 A. Mr. Hill's decoupling study should be rejected entirely. He asserts but does not  
23 demonstrate in any way that the reduction in volatility in revenues is related to the

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<sup>80</sup> Mr. Hill notes that "investors are concerned with the non-diversifiable risk of an investment, not the total risk. Therefore, in theory, it is unlikely that investors will respond to the differences in total risk captured in this analysis because some portion of that risk could be diversified away." Hill, Exh. No. \_\_\_(SGH-2T), at page 112, line 22, through page 113, line 2.

<sup>81</sup> *WUTC v. Puget Sound Energy, Inc.*, Order 07 Final Order Granting Petition, Dockets UE-121697, *et al.* (consolidated) (June 25, 2013).

<sup>82</sup> Order 07 at page ii, Synopsis (italics in original).

1 cost of capital. This is the critical assumption in Mr. Hill's testimony; there is no  
2 proof of a reduction or even a direct link to the cost of capital. Using that  
3 assumption, he calculates an assumed effect on the return on equity. The size of  
4 Mr. Hill's return on equity adjustment depends entirely upon two unproven  
5 assumptions: first, he assumes decoupling reduces the volatility of PSE's  
6 revenues by 35 percent, and second, he assumes that somehow (completely  
7 unexplained) that the effect on the return on equity of a reduction in the volatility  
8 of revenues is appropriately measured only the change in the third standard  
9 deviation. Neither assumption is directly related to the cost of capital, which  
10 illustrates the highly arbitrary nature of the Mr. Hill's analysis. Furthermore, his  
11 estimate is not even consistent with his own theory. If he had been consistent, the  
12 resulting return on equity would be less than PSE's cost of debt, which contradicts  
13 basic finance theory that the cost of equity for any company exceeds its cost of  
14 debt.

#### 15 IV. CONCLUSION

16 **Q. Does that conclude your prefiled rebuttal testimony?**

17 **A. Yes, it does.**