BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket Nos. UE-121697 and UG-121705
Puget Sound Energy, Inc. and NW Energy Coalition
Joint Petition for Approval of a Decoupling Mechanism

Docket Nos. UE-130137 and Docket No. UG-130138
Puget Sound Energy, Inc. Expedited Rate Filing

ICNU DATA REQUEST NO. 02.23

ICNU DATA REQUEST NO. 02.23:

Please provide any comments submitted by Ralph Cavanagh as a peer reviewer to the Brattle Group's March 20, 2014 study: *The Impact of Revenue Decoupling on the Cost of Capital for Electric Utilities: An Empirical Investigation.*

First Revised Response:

Attached as Attachment A to Puget Sound Energy, Inc.'s ("PSE") First Revised Response to ICNU Data Request No. 02.23 are suggestions provided by The Energy Foundation to a draft of *The Impact of Revenue Decoupling on the Cost of Capital for Electric Utilities: An Empirical Investigation*. These revisions include suggested comments and revisions provided by Sheryl Carter and Ralph Cavanagh. Ms. Carter and Mr. Cavanagh each serves as a Co-Director of Energy Program at Natural Resources Defense Council, Inc.

ATTACHMENT A to
PSE's First Revised Response to
ICNU Data Request No. 02.23

FINAL DRAFT

The Impact of Revenue Decoupling on the Cost of Capital for ~~in the~~ Electric Utilities ~~Industry~~: An Empirical Investigation

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February 11, 2014

THE Brattle GROUP

This report was prepared for The Energy Foundation. All results and any errors are the responsibility of the authors and do not represent the opinion of The Brattle Group, Inc. or its clients.

Acknowledgement: We acknowledge the valuable contributions of many individuals to this report and to the underlying analysis, including members of a peer review group that included ~~put together by Ralph Cavanaugh of NRDC, including Devra Wang,~~ Sheryl Carter, Ralph Cavanagh, ~~and~~ Marty Kushler and Devra Wang.

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I. OVERVIEW AND SUMMARY

Research into the costs and benefits of Energy Efficiency (EE) technologies has shown that the expected value of long-run savings frequently exceeds the costs, and EE programs have the additional benefit of producing no harmful emissions. From 2007 to the present, several more states have adopted long-term goals for EE and have designated utilities, and in a few cases third party entities, as the program administrators. Despite the programs being beneficial and cost-effective to society and to ~~the~~ utility systems, traditional regulation creates a substantial disincentive for utilities to pursue EE programs.

Comment [SC1]: Most programs also pass the utility cost test and therefore are the cheapest resource to the utility system.

Traditional cost-of-service ratemaking collects a utility's total costs, fixed and variable, largely through volumetric rates. A large portion of an electric, gas, or water utility's costs is fixed in the short run and does not vary with the quantity of the service provided (kWh, Therms, or Cubic feet), but a successful EE program will reduce the volume of sales, which will simultaneously reduce the recovery of fixed costs. If sales are lower than expected when rates are set, a utility will not fully recover its authorized fixed ~~-~~cost revenue requirements~~;~~ and if sales are higher than expected, a utility will over-collect that revenue requirement.~~more than the allowed fixed~~ costs. ~~A utility's cost of capital is one type of fixed cost, so lower sales means lower profit to investor owned utilities~~. As a result, utilities have what is often called a "throughput incentive" that conflicts with the objectives of EE programs.

Comment [SC2]: The flip side is an important component and is referred to in short hand later on (p 4 for example) so it makes sense to briefly explain here. And of course, as you point out later, lower sales don't automatically mean "lower profit," depending on how well the utility controls its costs; better to simply make the general point about the linkage between sales and fixed cost recovery.

Decoupling is a form of regulated ratemaking that disconnects fixed cost recovery from changes in the utility's sales volume.[1] It originated as a policy response in the 1980s when utilities were first encouraged to develop EE programs that significantly reduced the consumption of regulated commodities, such as electricity, gas, or water.[2] Decoupling solves the through-put disincentive. The Brattle Group's (Brattle) recent survey of new, alternative ratemaking policies listed 22 states

1 Decoupling used in this report is used to mean decoupling through symmetric revenue true-up mechanisms. An overall base revenue target is established for a future period. A periodic adjustment of volumetric rates is instituted to true up actual revenues to target revenues, whether actual revenues are above or below the target. Two other alternative ratemaking policies have some similarities but are not included in this study. One is the lost revenue adjustment mechanism (LRAM) for recovering base revenues lost from only validated EE volumetric savings. A second policy is the straight fixed-variable rate design that collects all or most fixed costs in non-volumetric charges.

2 This report focuses on the electric utility industry. There are many similarities and common lessons for decoupling policy development in the electric, natural gas, and private water service industries. Prior research by The Brattle Group addressed the natural gas delivery industry, see footnote 5 below.

that allowed gas industry decoupling and 12 states that had~~ve~~ electric industry decoupling.[3] This report builds on several public surveys of alternative ratemaking policies that include decoupling.[4] In the last half dozen years, decoupling has grown rapidly in the electric industry coincident with the upsurge in expenditures for conservation programs, efficiency standards, and the general flattening of electricity sales.

Because of the potential effect on the cost on equity (COE), the adoption of EE programs accompanied by a decoupling policy is sometimes resisted by both regulated companies and interveners for opposite reasons. Some interveners and commission staffs have argued that the allowed ROE should be reduced because decoupling, by design, reduces the variability of revenues, which they believe translates directly into reduced business risk. If the allowed ROE is not reduced, those interveners may not support decoupling. Utilities fear that adoption of decoupling will result in a reduction in the allowed return on equity (ROE) even if there is no proof that decoupling actually reduces the cost of capital. Determining the actual, empirical effect of decoupling on the utility's cost of capital is critical to answering the question of whether the regulated company's allowed cost of capital should be reduced at the time of adoption.

Comment [SC3]: It isn't spelled out until p 13.

The Brattle authors have considerable experience with the issues of decoupling rate policy and the frequently asked question as to whether it has a measurable impact on the cost of capital (COC) of regulated companies, as assessed in financial markets. In 2010 and again in 2013, the authors empirically tested the hypothesis in the natural gas delivery industry and found that there was no statistically measurable effect on the COC with decoupling.[5] In this report, we test

3 Joe Wharton, Bente Villadsen, and Heidi Bishop, *Alternative Regulation and Ratemaking Approaches for Water Companies - Supporting Capital Investment Needs of the 21st Century*, The Brattle Group, Prepared for the National Association of Water Companies, September 30, 2013. The number of companies/states with decoupling changes relatively frequently. For example, Washington State returned to decoupling in mid-2013, a change that was not in the Brattle survey, *Op. Cit.*

4 Sources of information on decoupling and other alternative regulatory policies beyond the Brattle survey *Op. Cit.* include Pamela Morgan, *A Decade of Decoupling for U.S. Energy Industries: Rate Impacts, Designs, and Observations*, Dec. 2012; Edison Electric Institute (EEI), *Alternative Regulation for Evolving Utility Challenges: An Updated Survey*, Pacific Economics Group Research LLC, Jan. 2013; Institute of Electric Efficiency (IEE), *State Electric Efficiency Regulatory Frameworks*, July 2013; and American Gas Association (AGA), *Natural Gas Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms Current List*, Cynthia J. Marple, power point presentation, Sept. 2012. For this study, Brattle reviewed many of the sources and updated the periods that decoupling policies have been in place for different states.

5 In the previous research, the authors analyzed a sample of 12 natural gas delivery holding companies (HCs) and their 31 regulated gas subsidiaries over the period 2005 to 2012. The number of gas subsidiary companies operating under decoupling grew from 8 to 22 over the period. This analysis made accurate measurements of the cost of capital and developed consistent measurements of the

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the same hypothesis for a different set of utilities which are predominantly in the electric utility business.

Theoretical arguments for reducing the cost of capital are frequently offered by interveners in decoupling regulatory proceedings for electric and natural gas companies and have been accepted in a small number of commission decisions.[6] In some proceedings, different interveners have suggested that the effect of decoupling on ROE is anywhere from 25 basis points (bps) to 300 bps.[7] In the past, the Brattle authors have testified that in these regulated, high fixed cost industries, the determinants of the cost of capital are complicated,[8] and there should be no presumption that decoupling automatically lowers the cost of capital. Adoption of decoupling policies could be coincident with other influences that may be increasing non-diversifiable risk.[9] Any reduction in the allowed return on equity should be based upon evidence that decoupling reduces the cost of capital.

The results of our empirical analysis of decoupling in the electric industry do not support the hypothesis that utilities with decoupling have a lower cost of capital than utilities without decoupling. Our results show that the coefficient on the decoupling index is not statistically different from zero, which indicates that decoupling is not associated with a statistically significant decrease in the estimated cost of capital. This result is consistent with our previous findings for the natural gas local distribution industry.

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degree of decoupling of each HC for a decoupling "metric". The findings were that decoupling shows no statistically significant impact on the COC either up or down. See J. Wharton, M. Vilbert, C. Gibbons, and S. Lagos, *An Empirical Study of Impact of Decoupling on Cost of Capital*, Power Point presentation to the Western Conference of the Rutgers University Center for Research in Regulated Industries (CRRI), June 21, 2013.

6 Pamela Morgan found that the return on equity (ROE) was not reduced in 78% of the Commission decisions adopting decoupling. The remaining decisions reduced the allowed ROE by 10 and 50 basis points. In settlements, 85% had no ROE reductions and the remaining 15% were between 10 and 25 basis points. See "A Decade of Decoupling for U.S. Energy Industries: Rate Impacts, Designs, and Observations", Dec. 2012, p. 14.

7 For example, see pp. 19-20 of "Phase 1B Testimony of Terry L. Murray on behalf of the Division of Ratepayer Advocates on Return on Equity Adjustments" before the California Public Utilities Commission, filed October 19, 2007 in Docket No. I. 07-01-022. See a recent discussion on p. 44 of Washington Utilities and Transportation Commission, *Puget Sound Energy, Final Order Granting Petition*, Docket UE-121697, Section D.2.b "Decoupling – Cost of Capital," June 25, 2013.

8 See Chapters 7-9, Brealey, Myers and Allen, *Principles of Corporate Finance*, 11th edition, McGraw Hill Irwin, 2014 for a discussion of the cost of capital.

9 Diversifiable risks, such as weather, do not affect the cost of capital because diversifiable risks can be eliminated by investing in a portfolio of unrelated assets.

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II. DEVELOPMENTS IN THE POLICY OF REVENUE DECOUPLING

Adoption of a revenue decoupling ~~rate~~ policy[10] severs the link between recoveries of base or fixed revenues[11], from volumetric sales of kWh, which would normally be the case under traditional cost-of-service regulation. Cost recovery is not based upon actual kWh sales, but instead a revenue target is established, and revenues are adjusted to achieve the target. For example, the percent growth in revenues relative to the base period could be set at actual net percentage growth in the numbers of customers over the base period. Over a pre-established period, such as a year, there is an adjustment of rates that will true-up the actual revenues to the target, whether actual sales are higher or lower than expected.

Comment [R4]: It's of course more a "revenue" policy than a "rate" policy, particularly since it requires no change in rate design.

Current decoupling policies frequently evolve from the same policy basis as the earliest version ~~decoupling~~, which was instituted in California in the early 1980's for electric utilities (and even earlier for natural gas utilities). California policy makers determined that decoupling would be "in the public interest" because it provided relief for differences in actual revenues compared to forecast revenues when utilities carried out the policy directives to pursue aggressive energy efficiency goals. Customers are protected if sales are greater than forecast, and utilities recover their fixed costs if EE programs are more effective than expected.

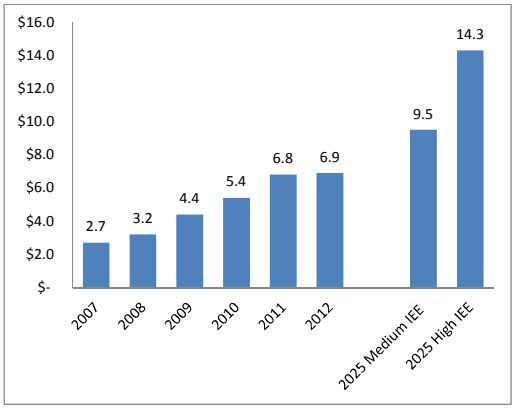
Figure 1 shows the substantial increase in EE expenditures by electric utilities since 2007 as well as two projections of expenditures in 2025.[12] The growth of EE programs, the consequent installation of efficiency measures (equipment and structures), and the concurrent decline in kWh sales growth, especially for small customers on volumetric rates, highlights the importance of addressing the throughput incentive of regulated utilities.

10 The treatment of decoupling in this study is straight forward: at a given time, a decoupling policy is in place or it is not. We recognize but do not attempt to differentiate the several different kinds of decoupling mechanisms. Decoupling policies can vary in several dimensions: the coverage and independence of rate classes; the inclusiveness of causes of demand fluctuation (weather fluctuations may be excluded); the adjustment over time using revenue target adjustment mechanism (numbers of customers and certain cost categories can be used to adjust targets over time).

11 Lost revenues for the recovery of variable costs, such as fuel and purchased power, are not included in decoupling true-ups because variable costs are avoided with the reduction in kWh consumption. Fixed costs only change in the long-term when depreciation and conservation leads to less system investment.

12 Institute of Electric Efficiency (IEE); *State Electric Efficiency Regulatory Frameworks*, July 2013, p. 2. The values are spending and budgets for customer-funded electric efficiency programs.

Figure 1: U.S. Energy Efficiency Expenditures (Customer funded, in $ Billions)



Source: Institute for Electric Efficiency, 2013

Figure 2 shows a map of the states that at present or in the recent past have had a policy of decoupling.[13] This is the starting point of the analysis. Utilities in CA, WA and RI (shown in green) were not used in our sample. National Grid in RI was removed in the financial data screening, which is discussed in Section IV below. The major CA utilities had the policy of decoupling or its equivalent across the entire study period 2005 – 2012, and saw no change in policy, so there was nothing to compare it with. WA regulators approved decoupling for Puget Sound Energy in June 2013, after the study period ended.[14]

Comment [R5]: I can't find an explanation of why RI was removed. Please footnote it here.

Comment [SC6]: Since this isn't explained until later on, it might help to do it here.

13 In principle and practice, decoupling can be ended. Our sample includes utilities in MI where decoupling for electric utilities was instituted by the commission for several electric companies and later determined to be illegal under state law.

14 See Washington Utilities and Transportation Commission, Puget Sound Energy, *Op. Cit.*, footnote 7. Puget Sound Power & Light, predecessor to Puget Sound Energy, had a decoupling mechanism in place from 1991 to 1995, at which time it was discontinued. This is before the Study Period.

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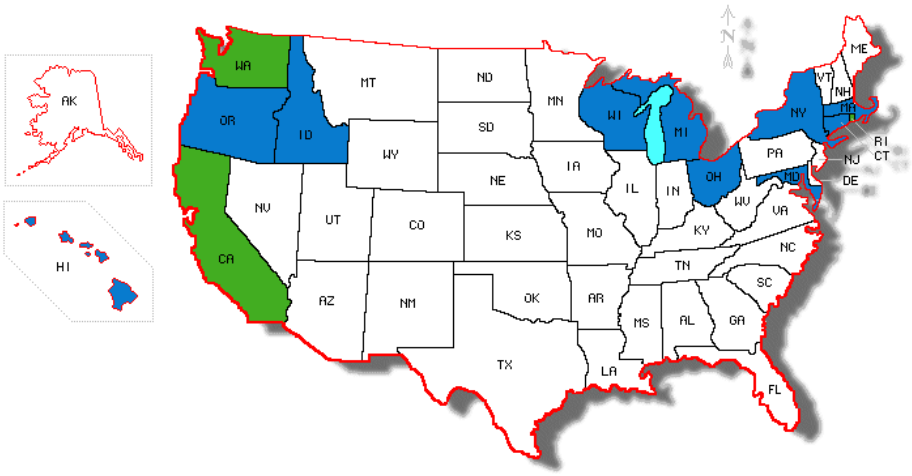
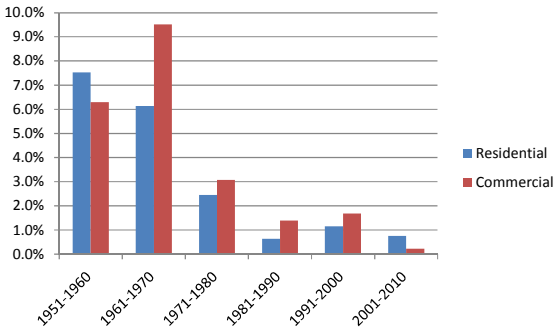
Figure 2: States with a Policy of Decoupling for Electric Utilities at Some Time from 2005 to the Present



Source: The Brattle Group, especially report *Alternative Regulation and Ratemaking Approaches for Water Companies*, Sep. 30, 2013. All states were in the study sample, except WA, CA and RI, shown in green.

Decoupling policies often focus on the residential and commercial classes, where volumetric charges collect a considerable portion of the base revenue requirement that recovers capital investment and fixed O&M costs of distribution. Figure 3 shows the downward trend in residential and commercial electric consumption growth in recent decades ~~over past 60 years~~, indicating that it ~~growth of electric consumption~~ is likely to be lower than population or GDP growth in the future. Decoupling can be used to address the situation where fixed and unavoidable costs continue to increase, but where sales volume growth is slow or decreasing for any reasons, including ~~outside of~~ the utility's EE programs, ~~such as~~ building codes, appliance efficiency standards, and the installation of distributed generation systems on customers' premises. ~~adoption of conservation practices~~.

Figure 3: Trends in Electric Consumption Growth by Decade: 1951 - 2010



~~Recently, the rapid growth of distributed generation, particularly solar photovoltaic systems by residential and non-residential customers at the distribution level, has added a new source of reduced revenues from volumetric charges. Decoupling ratemaking policies are of growing interest to address these changes as well.~~

Comment [R7]: Incorporated in previous paragraph.

III. COST OF CAPITAL THEORY AND THE IMPACTS OF DECOUPLING

A regulated utility's operating earnings (i.e., earnings before income taxes) are the difference between base revenues (non-fuel) and the sum of all prudent costs (operations and maintenance (O&M), administrative and general (A&G), depreciation, and interest). There are several sources of variability in the base revenue stream that can be eliminated by the decoupling mechanism analyzed here. EE programs normally decrease revenues because they decrease sales. Other increases and/or decreases in base revenues are driven by changes in weather, business activity over the business cycle, the number of net new customers, local, state and federal building and appliance codes and standards, and the number of delinquent bills. By design, decoupling ratemaking eliminates or significantly weakens the linkage between revenues and the volume sold, independently from the sources of variability.

Decoupling should stabilize revenues, but net income can still vary. Although depreciation and interest expense are relatively stable, other costs can change materially between rate cases. At times of rapid capital investment, for example, when utilities face significant environmental retrofits and replacements, depreciation and interest may also increase rapidly and put pressure on earnings without more frequent rate cases.

If decoupling stabilizes the revenue side of the earnings equation, does it stabilize operating earnings as well? This leads directly to the question: does decoupling reduce non-diversifiable risk since this is the risk that determines the cost of capital in financial markets? We shall see that the answer is not a simple "yes."

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Not all risks or sources of variance in earnings affect the cost of capital equally, because investors can avoid certain risks. Diversification through portfolio formation can remove diversifiable risks; therefore, diversifiable risks do not affect the cost of capital. For example, extremes of weather will cause variance in a single utility's revenues and are a risk factor for that utility's earnings. However, investors can assemble a portfolio of utility stocks from across the climate zones in the U.S. and thus mitigate the effects of weather on individual stocks. For a portfolio of utility stocks, the effect of weather variations should largely cancel out, removing weather as a source of investment risk, and negating its effect on the cost of capital. The possibility of diversification removing weather-induced revenue risk is true regardless of whether the weather risk is removed or left in with a decoupling policy.

Non-diversifiable risks (also known as "business risks") are the risks that remain after diversification. Because investors must bear them, these risks drive a company's cost of capital. The distinction between diversifiable risk and non-diversifiable business risk is important to recognize when evaluating the effect of decoupling, or other regulatory policies, on a company's cost of capital. Simply reducing total risk, i.e., the sum of diversifiable and non-diversifiable risk, does not imply that the cost of capital has been reduced. The risk reduced must be part of a company's business risk, i.e., its non-diversifiable risk, to affect its cost of capital.

Decoupling is often praised by credit rating agencies because it clearly reduces total risk, which is the risk important to bond holds. Adoption of decoupling could reduce the overall cost of capital for a company through a reduction in the cost of debt, but that would not justify a reduction in the allowed ROE. Only reductions in business risk justify a reduction in a regulated company's allowed ROE.

The effect of decoupling on the cost of capital in the current electric environment of low growth and high investment cannot be determined solely on theoretical reasoning. Empirical analysis is needed, looking at the record compiled by utilities across the nation, both before and after adoption of decoupling mechanisms. ~~The empirical question of the effect on the cost of capital should be addressed by analyzing the companies that have different levels of decoupling over time.~~

~~Finally, the theory of finance holds that whether the regulator does or does not reduce the regulated subsidiary's allowed ROE when it approves decoupling will not affect the holding company's cost of capital. This is because the cost of capital is determined in the capital markets and market prices can adjust so that a new investor will expect to earn the cost of capital.~~

IV. CREATING A DECOUPLING SAMPLE OF REGULATED ELECTRIC UTILITIES

We start with a large sample of regulated electric company subsidiaries and their holding companies and then compile data on which companies have decoupling and when the policy was officially adopted. We immediately note an important dichotomy. Holding companies, not their

Comment [R8]: This is an interesting argument (not previously encountered), but I'm not clear why you are so sure that a portfolio of utility stocks should "cancel out" weather risks; presumably extreme heat or cold could be widespread across the country, and a trend toward more extreme weather could raise revenue risks across an entire utility stock portfolio unless decoupling removed those risks. Is there citable evidence supporting the "cancel out" proposition? I'm nervous about the proposition that weather risk is essentially irrelevant to decoupling policy. Isn't it sufficient here to observe that the sample under analysis included decoupling mechanisms with different treatments of weather risk, that there is no overall indication of impact on cost of capital, and that there are other ways for utility investors in utility stocks to mitigate weather risks? That avoids giving anti-decoupling advocates an opening to resist any reduction in weather risk for utilities and their customers in the context of individual mechanisms.

Comment [SC9]: Little more explanatory detail may be helpful here, and (added by Cavanagh) it's not clear what you're referring to here, since (e.g.) you just indicated that whether or not decoupling adjusts for weather is likely not relevant to cost of capital observed in the market.

Comment [R10]: This paragraph adds a somewhat confusing nuance with no obvious value to the overall analysis; I encourage you to remove it, or at minimum to clarify why you're making this point. The next section addresses the distinction between holding companies and subsidiaries; why isn't that sufficient?