EXHIBIT NO. ___(EDH-5CT)
DOCKET NO. UE-111048/UG-111049
2011 PSE GENERAL RATE CASE
WITNESS: EZRA D. HAUSMAN

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-111048** **Docket No. UG-111049** ***(Consolidated)***

[REDACTED VERSION]
CONFIDENTIAL
CROSS-ANSWERING TESTIMONY OF
EZRA D. HAUSMAN, PH.D.
ON BEHALF OF THE SIERRA CLUB

JANUARY 17, 2012

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EXHIBITS

1. INTRODUCTION

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

A. My name is Ezra D. Hausman, Ph.D., and I am Vice President of Synapse Energy Economics ("Synapse"), located at 485 Massachusetts Avenue, Cambridge, Massachusetts, 02139.

Q. Are you the same Dr. Ezra D. Hausman who previously filed direct testimony in this case on behalf of the Sierra Club?

A. Yes.

Q. What is the purpose of your cross-answering testimony?

A. The purpose of this testimony is to rebut certain statements and conclusions made by Mr. Scott Norwood in his direct testimony on behalf of Public Counsel and the Industrial Customers of Northwest Utilities. Contrary to the position of Mr. Norwood, I find that the Lower Snake River project Phase I (LSR 1) is a reasonable investment that will provide benefits to PSE's ratepayers over the life of the project.

Q, What does Mr. Norwood conclude regarding PSE's investment in LSR 1?

A. Mr. Norwood concludes that the investment was "imprudent and unnecessary and that the plant will not be used and useful when placed in service early next year."[1]

Q. On what does Mr. Norwood base this conclusion?

A. Mr. Norwood identifies a number of areas in which he feels that the company should have used different assumptions or applied a different methodology in its analysis. He also presents his own analysis of available renewable resources for PSE relative to the company's requirements under the Washington Renewable Portfolio Standard (RPS) and argues that the company already has a significant surplus of RECs. Finally, Mr. Norwood presents his own matrix of NPV scenarios

[1] Exhibit No.___(SN-1CT) p. 7 at 14.

to argue that in most of the cases he analyzed, the project does not look like it provides economic benefits for ratepayers on an NPV basis.

Q. Do you find Mr. Norwood's arguments compelling?

A. No. As I will describe below, I find that Mr. Norwood has misrepresented his findings by suggesting, directly or indirectly, that his results discredit the company's analysis and contradict its results, which they do not. As I will discuss, I disagree with many of Mr. Norwood's individual points; but whether one agrees with these or not, his conclusions are simply not supported by a careful reading of his analysis.

2. MR. NORWOOD'S SUGGESTED CORRECTIONS TO PSE'S ANALYSIS

Q. Do you agree with Mr. Norwood that the company "failed to use the proper market energy price forecast for all of the Business as Usual (BAU) scenarios"? [2]

A. I have no reason to question Mr. Norwood's statement in this regard, and I understand that the company acknowledged this error. However, it is not correct to say that this error "overstated the benefit of adding renewable energy before it was necessary by approximately $177 million."[3] This error *only* applied to the BAU scenarios, which was only part of the company's analysis.

Q. Do you agree with Mr. Norwood that the company "failed to consider the REC banking provisions of Washington's RPS statute and thus overstated the level of renewable energy needed to meet RPS requirements"?[4]

A. Again, I agree that the company did not explicitly consider REC banking, but I do not agree with Mr. Norwood's conclusion regarding the impact of this decision. In fact, the banking provision under RCW 19.285.040(2)(e) explicitly does not alter the amount of renewable energy required to meet the RPS requirements, except that it allows the company some flexibility in smoothing out year-to-year

[2] Exhibit No.___(SN-1CT) p. 29 at 7.
[3] Exhibit No.___(SN-1CT) p. 29 at 10.
[4] Exhibit No.___(SN-1CT) p. 29 at 11.

variations in resource output. It is possible that subparagraph (e) could be interpreted to allow use of RECs **produced** in the year prior to the RPS requirement taking effect to meet the requirement in 2012 [RCW 19.285.040(2)(a)(i)], and Mr. Norwood's workpapers demonstrate that he assumes this to be the case. In my opinion, this would be an unusual interpretation of this provision and would clearly circumvent the Legislature's intent.

Even were this to be permitted, however, it would have a minor impact on the company's overall costs. Over time, the company would still be required to produce or procure enough RECs to meet the law's requirements on average each year.

Q. Do you agree with Mr. Norwood's assertion that PSE's assumption regarding the availability of the federal Production Tax Credit (PTC) after 2012 was unreasonable, given the fact that "PTCs have been available for the last 20 years"?[5]

A. I do not. The future of the PTC is unknown despite the extraordinary role this tax credit has played in supporting renewable energy resource development and providing numerous economic, employment, and clean energy benefits. At this point in time, it is at least a reasonable and a fairly common position in the industry that the PTC's future is too uncertain to be banked upon.

Q. Do you agree with Mr. Norwood that the company's carbon price forecast was "outdated and overstated"?[6]

A. I do not. At the time the company performed its analysis, its carbon price forecast was within the range of numerous credible forecasts of likely carbon emissions prices. This issue is described in detail in Synapse' carbon price forecast report, which was included as Exhibit No. ___(EDH-4) with my direct testimony. Synapse produced a predecessor report in 2008 which I have included here as Exhibit No. ___(EDH-6), which would have been current as of PSE's 2009 IRP.

[5] Exhibit No.___(SN-1CT) p. 29 at 3.
[6] Exhibit No.___(SN-1CT) p. 29 at 18.

Converted into constant 2007 dollars, the 2009 Trends forecast is slightly higher than the Synapse "high" case that we recommend for use for utility resource planning purposes. As illustrated in Figure 4 on Page 17 of Exhibit No. ___(EDH-6), Synapse' "high" case by no means represented the highest forecast of possible future carbon emissions prices in the United States.

It is also incorrect to say that this forecast is "outdated", as it is exactly the same as the "high case" used in the company's 2011 IRP.

PSE's "2009 Trends" case, which is also their 2011 IRP "high" case, is consistent with the high-case price trajectories that Synapse recommends for resource planning purposes.

Q. Do you agree with Mr. Norwood's statement that "It was inconsistent and unreasonable for PSE to assume existing laws providing for PTCs would expire after 2013 in all scenarios, while at the same time assuming carbon taxes would be in effect in all scenarios"?[7]

A. No. I think PSE made a very reasonable assumption, because these two federal policy approaches would be in some ways overlapping—both would be intended to assist renewable resources in competing economically with fossil resources. If Congress were to enact a carbon tax at the level postulated by the company, or another policy with the same effect, then the PTC would likely no longer be needed.

One way to look at the company's approach is that they have used the carbon emissions price as a proxy for whatever unknown approach Congress may take in the future to pursue the policy goal of promoting clean energy and clean energy jobs. Using more than one such proxy, such as a carbon price and a PTC, would unnecessarily complicate the analysis and possibly overstate the likely impact of federal regulations.

[7] Exhibit No.___(SN-1CT) p. 38 at 2.

Q. Do you agree with Mr. Norwood's statement that PSE's use of "end effects" associated with new wind energy resources was "improperly calculated"[8] and with his implication that this cost component should be removed from the analysis?[9]

A. I do not agree that the end effects were "improperly calculated" although I do think there is a lot of room for disagreement on how these should be handled. PSE restricted its analysis to a 20-year time horizon, which necessarily means that wind built later will have a larger undepreciated value at the end of the study period than wind built earlier. Mr. Norwood raises the question of what the company would have to do *after* the life of the resource under consideration, which is a valid issue.

The further you gaze into the future, of course, the hazier the picture becomes in terms of regulatory requirements, technology, and costs. You have to cut off the analysis somewhere, and in my opinion the approach taken by the company is reasonable and is in keeping with standard utility resource planning practice.

Mr. Norwood argues otherwise, and as noted there is room for alternative approaches to calculating these end effects. But I do not agree that an appropriate remedy is to neglect them entirely, as Mr. Norwood has done in his reanalysis. Given that Mr. Norwood has proposed no alternative calculation, and that the company's approach is reasonable, I believe the Commission should accept the company's results in this area.

[8] Exhibit No.___(SN-1CT) p. 29 at 21.
[9] Exhibit No.___(SN-1CT) p. 42 at 20.

3. MEETING WASHINGTON'S RPS REQUIREMENTS

Q. Turning now to the Company's need for Renewable Energy Credits (RECs), Mr. Norwood describes in Section V(B) of his testimony his assessment of the need for LSR 1.[10] Have you reviewed Mr. Norwood's calculations and assumptions underlying this section of his testimony?

A. Yes. I have reviewed Mr. Norwood's workpapers provided on behalf of Public Counsel and ICNU in this docket.

Q. In Mr. Norwood's testimony, Figures 3, 4, and 5, he projects the company's RECs inventory relative to the RPS requirement for each year, under three different scenarios: in Figure 3, under the IRP case;[11] in Figure 4, under the "existing renewable energy without LSR 1",[12] and in Figure 5, including LSR 1.[13] Have you reviewed the calculations underlying these Tables?

A. Yes.

Q. Has Mr. Norwood correctly and accurately represented the company's likely RECs position in these tables?

A. In my opinion, these tables are quite misleading. Mr. Norwood "accurately" projects for each individual year the number of RECs that the company would have available in that year alone, including both RECs banked from the previous year, which would be eligible to meet that year's RPS requirement, and current-year RECs. However, any implication that this represents surplus RECs production each year would be incorrect. Because of the banking provision, the company could effectively bank each year's RECs for use the following year, and never use any current year RECs—and Mr. Norwood's calculations would count each of the RECs twice, once for the year in which they are produced (but not used), and once for the following year, when they are used.

[10] Exhibit No.___(SN-1CT) p. 29 *et seq.*
[11] Exhibit No.___(SN-1CT) p. 23.
[12] Exhibit No.___(SN-1CT) p. 24.
[13] Exhibit No.___(SN-1CT) p. 25.

It is true that the company intends to produce more renewable energy than required by the state RPS in the early years—this is the very nature of the "early wind" scenario. But Mr. Norwood's Figures vastly exaggerate this surplus by effectively double-counting so many of the RECs.

4. COSTS AND BENEFITS OF THE LOWER SNAKE RIVER PROJECT

Q. How does Mr. Norwood reach the conclusion that the Lower Snake River project is too costly?

A. Mr. Norwood claims that the Company's analysis of Lower Snake River commits several "major errors and extreme assumptions that overstate the estimated benefits of early wind additions."[14] He then assigns a value to many of these, which serve as his estimates for how much each "error or assumption" skewed the Company's analysis in favor of the early wind scenario.

Q. Do you agree with his characterizations of the Company's "major errors and extreme assumptions"?

A. As discussed above individually, I do not.

Q. Leaving aside for the moment your disagreement with the particulars of Mr. Norwood's criticisms, should they be treated as cumulative in terms of their impact on the company's analysis?

A. No. Despite the impression one might get from Mr. Norwood's testimony, these "corrections" should not be viewed as cumulative, even if one were to accept them as valid, which I do not. This was confirmed in Public Counsel and ICNU's response to Sierra Club Data Request No. 1-1, which describes these dollar figures as "not necessarily completely additive."[15]

[14] Exhibit No.___(SN-1CT) p. 5 at 1.
[15] Exhibit No.___(EDH-7).

Q. In Mr. Norwood's Confidential Figure 1 he presents the Net Present Value (NPV) of building "early wind" (i.e. LSR 1) versus "no early wind" (i.e. waiting until new resources are required to reach the RPS goals.) He concludes that "early wind additions are significantly more costly than postponing wind additions until needed to meet RPS requirements in all 14 scenarios evaluated over the next 10 years and in 7 of 14 scenarios over the next 20 years."[16] Have you reviewed this table, and the workpapers supporting it?

A. Yes.

Q. Does Mr. Norwood discuss the value of the investment using the proper time horizon?

A. Only in part. In Figure 1 and throughout Mr. Norwood's testimony, he discusses the net present value of the investment (i.e. discounted benefits minus costs) by focusing on five or ten year time horizons, along with a 20-year horizon. Of these, only the 20-year time horizon is an appropriate analysis period for such an investment, consistent with the approach used by PSE.

Q. Why does the time horizon matter, particularly for wind investments?

A. Since wind investments involve large capital costs up front, but minimal costs and substantial benefits in future years, discussing the net present value of a wind investment over a five or ten year period will unfairly weight the costs and neglect the longer-term benefits of the investment. The matrix of values in Figure 1 gives the impression that the overwhelming majority of "scenarios" favors "no early wind"; however, in my opinion, the first two columns of this matrix are irrelevant.

[16] Exhibit No.___(SN-1CT) p. 4 at 4.

Q. What result from PSE's analysis does Mr. Norwood present for the 20-year horizon?

A. In Figure 1, Mr. Norwood presents the 20-year net present value of building "early wind" as an average loss of [CONFIDENTIAL] [redacted] [END CONFIDENTIAL] for all scenarios[17]—essentially indistinguishable from zero.

Q. What are the averages between the 2009 BAU and 2009 Trends scenarios in Figure 1?

A. Mr. Norwood does not present these figures, but the average for the 2009 BAU scenarios is about [CONFIDENTIAL] [redacted] [END CONFIDENTIAL] in net costs and for the 2009 Trends about [CONFIDENTIAL] [redacted] [END CONFIDENTIAL] in net benefits. Seven of the 14 scenarios (mainly "2009 BAU") showed net costs for early wind, and seven (mainly "2009 Trends") showed net benefits.

Q. Given these results, do you conclude that the expected NPV of the early wind vs. no early wind are indistinguishable?

A. No. In preparing Figure 1, Mr. Norwood removed the "end effects" used in PSE's NPV calculations. As discussed earlier, there may be reasonable alternative approaches to calculating end effects, but neglecting them entirely is clearly not correct.

Below I present a revised version of Figure 1, including only 20-year NPV calculations, with and without end effects. As may be seen in this Figure, when end effects are included the early wind scenario clearly dominates the no early wind scenario.

[17] Exhibit No.___(SN-1CT) p. 4.

[CONFIDENTIAL]

[END CONFIDENTIAL]

Q. Do the numbers in your Figure 1 include the correct prices for the BAU scenario, as discussed in Mr. Norwood's testimony?

A. Yes. PSE's response to Public Counsel Data Request No. 345 describes the underlying values for the BAU scenario as including "the lower cost of secondary market purchases reflecting the lower market prices, low gas prices, and lower carbon prices in the 2009 BAU market price scenario."[18]

[18] Exhibit No.___(EDH-8).

5. BENEFITS OF WIND POWER

Q. Does Mr. Norwood discuss the benefits of wind power investments?

A. Mr. Norwood states repeatedly throughout his testimony that there are no benefits from wind investments such as LSR 1. He refers to "large discretionary capital investments such as the LSR 1 project, which offer no near-term benefits".[19] Norwood goes on to state that there are "no benefits from early wind additions over the next 10 years under all scenarios, and no benefits over the next 20 years in half of the scenarios evaluated."[20] He finally claims that "*there are no forecasted benefits* of adding new wind generation early in any scenario over the next 10 years."[21]

Q. Do you agree with Mr. Norwood that there are "no benefits" from wind investments?

A. No. Mr. Norwood's statements in this regard are dramatically out of step with the intention of the Legislature in creating the Washington state RPS; with the U.S. Congress in setting up the treasury grant program to stimulate accelerated development of renewable resources; with the common wisdom and experience of energy economists who recognize the value of energy, capacity, and RECs from such projects; and with anyone who recognizes the environmental, global climate, and public health benefits of replacing fossil fuels with renewable energy sources.

Wind energy resources create power at a stable and predictable cost with no emissions of greenhouse gases or criteria pollutants. They produce power without depleting or compromising water resources, and without requiring the production and transportation of fossil fuels from out of state or across international borders. Investment in and operation of wind resources creates jobs and produces a stream of local tax revenues; production of surplus RECs can translate into an additional revenue stream for the utility. Utility ownership of wind resources reduces ratepayer exposure to volatile fuel prices, and to current or future costs for

[19] Exhibit No.___(SN-1CT) p. 18 at 19.
[20] Exhibit No.___(SN-1CT) p. 45 at 18.
[21] Exhibit No.___(SN-1CT) p. 46 at 1 (emphasis in the original).

emissions of carbon dioxide and other pollutants. Early investment in wind accelerates all of these benefits—indeed this is the very purpose of the Federal Treasury grant program; responding to this incentive served as part of the basis for PSE's decision to move forward with its LSR 1 acquisition, exactly as Congress intended.

It is simply incorrect to state that building early wind has no benefits. Of course, all of these benefits come at some cost; the purpose of PSE's analysis was to evaluate whether the cost of building wind early was justified by the benefits, and they correctly concluded that it was.

Q. Do you agree with Mr. Norwood's conclusions that the Company's "investment in LSR1 was imprudent and unnecessary and that the plant will not be used and useful when placed into service early next year"[22] or that "[t]he early addition of the unit was not cost justified"?[23]

A. No, for the many reasons discussed above.

Q. Does this conclude your testimony?

A. Yes.

[22] Exhibit No.___(SN-1CT) p. 50 at 18.
[23] Exhibit No.___(SN-1CT) p. 50 at 20.