EXHIBIT NO. ___(AS-1HCT)
DOCKET NO. UE-11____/UG-11____
2011 PSE GENERAL RATE CASE
WITNESS: ALIZA SEELIG

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-11____** **Docket No. UG-11____**

PREFILED DIRECT TESTIMONY (HIGHLY CONFIDENTIAL) OF ALIZA SEELIG ON BEHALF OF PUGET SOUND ENERGY, INC.

REDACTED VERSION

JUNE 13, 2011

PUGET SOUND ENERGY, INC.

PREFILED DIRECT TESTIMONY (HIGHLY CONFIDENTIAL) OF ALIZA SEELIG

CONTENTS

PUGET SOUND ENERGY, INC.

PREFILED DIRECT TESTIMONY (HIGHLY CONFIDENTIAL) OF ALIZA SEELIG

I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy, Inc.

A. My name is Aliza Seelig. My business address is 10885 N.E. Fourth Street Bellevue, WA 98004. I am a Consulting Energy Resource Planning and Acquisition Analyst.

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes, I have. It is Exhibit No. ___(AS-2).

Q. What are your duties as Consulting Energy Resource Planning and Acquisition Analyst?

A. My present responsibilities include review of and participation in analysis of individual power resources and portfolios of power resources for PSE's resource acquisition processes. I was the project manager responsible for managing the quantitative and qualitative evaluations of the 2010 Request for Proposals

(the "2010 RFP"). In addition, I took the lead in negotiating the Klamath Peaker 5-Year PPA discussed below.

Q. What is the nature of your prefiled direct testimony in this proceeding?

A. This prefiled direct testimony describes the 2010 RFP process and the quantitative and qualitative evaluation of the following resources for which PSE requests a prudence determination in this proceeding:

- Phase 1 of the Lower Snake River Wind Project ("LSR Phase 1"), a 343-megawatt ("MW") wind project located near the town of Pomeroy in Garfield County, Washington; and
- a four-year and two-month power purchase agreement with Iberdrola Renewables, Inc. ("Iberdrola Renewables") for 100 MW of winter capacity associated with the Klamath peakers (the "Klamath Peaker 5-Year PPA").

This prefiled direct testimony demonstrates that LSR Phase 1 is the lowest reasonable cost and lowest reasonable risk resource that meets the renewable of PSE and its customers. Further, the testimony demonstrates that the Klamath Peaker 5-Year PPA is the lowest reasonable cost and lowest reasonable risk resource that meets the capacity needs of PSE and its customers.

II. PSE'S EVALUATION OF RESOURCE ALTERNATIVES

A. Overview

Q. What did PSE do to evaluate potential resources to meet its need?

A. Please see the Prefiled Direct Testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), which describes PSE's need for resources leading up to PSE's issuance of the 2010 RFP. Prior to the evaluation of 2010 RFP proposals, PSE examined how changes in the market not included in the 2009 Integrated Resource Plan (the "2009 IRP") affected the cost-effective level of renewable resources to meet PSE's renewable resource need. PSE evaluated the proposals submitted in response to the 2010 RFP in two phases based on criteria designed to take into account qualitative and quantitative factors.

Q. How did PSE organize and document its efforts during the 2010 RFP processes?

A. From March to August 2010, PSE staff responsible for the 2010 RFP evaluation met regularly to review, discuss, and document findings and recommendations until the completion of the 2010 RFP. In addition to its own staff, PSE used two outside consulting firms to assist with the evaluation.

During the course of the evaluation process, PSE staff regularly presented updates to PSE's management on the status of the evaluation and any preliminary conclusions. PSE's management, in turn, regularly apprised PSE's Board of

Directors of the status of the evaluation process. Furthermore, PSE staff made periodic updates between December 2009 and May 2011 to the Staff of the Washington Utilities and Transportation Commission ("Commission Staff") on the 2010 RFP evaluation process and results.

PSE's evaluation process and conclusions, reached at various stages of its analysis, are further explained below, and were documented in reports and presentations prepared during the course of the evaluation. Please see Exhibit No. ___(AS-3HC) for a copy of PSE's 2010 RFP Process Document.

B. PSE Saw an Increase in Responses to Its 2010 RFP Over Previous RFPs

Q. How many responses did PSE receive to its 2010 RFP?

A. PSE saw an increase in responses to its 2010 RFP over previous RFPs. PSE received 64 proposals submitted by 55 respondents, for a combined total of more than 9.9 GW of proposed resources (excluding Market PPAs, discussed below). Some proposals contained multiple transaction options, such as offering a PPA, an asset ownership, different term lengths, and/or deal structuring. *See* Exhibit No. ___(AS-3HC) at 17-22 and 94-101.

Table 1 below summarizes the overall resource mix and number of MWs proposed.

Table 1. Summary of Response to 2010 RFP

	Proposals	Offers	MW
Biomass	9	10	590
Demand Response	1	2	80
Hydro / System PPA	2	3	105
Market PPA	10	10	TBD
Natural Gas – CCCT	12	15	4498
Natural Gas – SCCT	6	9	844
RECs	2	6	N/A
Solar	1	1	10
Wind	21	31	3776
Total	**64**	**87**	**9903**

See Exhibit No. ___(AS-3HC) at 17.

Q. How were the 2010 RFP responses segmented for the evaluation process?

A. PSE has two distinct needs to fulfill—a renewable resource need and a capacity need. The Energy Independence Act (RCW 19.825) drives PSE's renewable resource need. Expiring contracts largely drive PSE's capacity need, and PSE's capacity needs are greatest during winter months.

PSE bifurcated the evaluation of the proposals based on each need. As discussed in Mr. Garratt's testimony, Exhibit No. ___(RG-1HCT), the then-applicable requirements of the Section 1603 Treasury Grant required renewable resources to have expended at least five percent of the total cost of the resource by the end of 2010 to qualify for the Section 1603 Treasury Grant. LSR Phase 1 and a significant number of the renewable resource proposals submitted in response to the 2010 RFP assumed economics based on the ability to capture the Section 1603 Treasury Grant. Therefore, PSE evaluated all renewable resources first, with the

intent to identify the lowest reasonable cost and lowest reasonable risk renewable resources and provide sufficient time to be able to qualify for the Section 1603 Treasury Grant. Once bifurcated, both the renewable evaluation and capacity evaluations then each followed a separate two-phase analysis process.

At the onset of the 2010 RFP, PSE received 33 proposals from renewable resources. PSE received 21 proposals for capacity resources (not including the biomass proposals). PSE also received 10 responses of interest for PPAs for generation sourced from unspecified resources delivered to the Mid-C market hub ("Market PPA").

Market PPA responses were eventually never considered because it was determined that they would not meet the requirement of PSE's capacity or renewable resource need. Please see the Exhibit No. ___(AS-3HC) at 90 and 189-192 for a discussion of PSE's evaluation of Market PPA proposals as part of the 2010 RFP.

C. PSE Also Considered Self-Build and Other Resource Acquisition Opportunities

Q. Is the RFP the only method by which PSE may acquire new resources?

A. No. PSE may acquire new resources to meet the needs of customers in several ways. Washington Administrative Code ("WAC") 480-107-001 states that a utility may acquire additional generation resources:

1) through a competitive bidding process, which PSE refers to as its request for proposal process;

2) by constructing additional electric resources ("self-build"); or

3) by purchasing power through negotiated contracts.

Q. Did PSE consider self-build resource options and resources not submitted in response to the 2010 RFP?

A. Yes. The timing of the 2010 RFP cycle made it possible to compare PSE's self-build renewable resource (i.e., LSR Phase 1) to more than 30 other renewable resource proposals. In fact, PSE specifically postponed the Board of Directors decision on whether or not to proceed with LSR Phase 1 to allow sufficient time for PSE to evaluate LSR Phase 1 with the renewable resource proposals submitted in response to the 2010 RFP. In addition to LSR Phase 1, PSE evaluated two other self-build projects during the 2010 RFP–a combined-cycle gas turbine ("CCGT") project and a simple-cycle gas turbine ("SCGT") peaker project with two different technology options.

PSE also evaluated a number of proposals submitted after the commencement of the 2010 RFP ("Unsolicited Proposals"). Please see Exhibit No. ___(AS-3HC) at 101 for a list of PSE's self-build projects and Unsolicited Proposals.

D. Evaluation Process Used for the 2010 RFP

Q. Please describe the 2010 RFP evaluation process.

A. PSE divided the 2010 RFP renewable and capacity evaluation processes into two phases. In Phase I, PSE conducts the initial screening and fatal flaw analysis and produces a list of the most promising resources (the "Candidate Short List"). In Phase II, PSE subjected the resources on the Candidate Short Lists to additional due diligence, including additional analytical modeling.

Q. Please describe the role of the 2010 RFP evaluation team.

A. PSE's Resource Acquisition department guides a cross-functional evaluation team (the "2010 RFP evaluation team") in screening and eliminating proposals with high costs, unacceptable risks, or feasibility constraints. The 2010 RFP evaluation team consists of staff from specific functional/technical areas within PSE (also referred to as "working groups") that led the evaluation from each working group's area of expertise (e.g., transmission, environmental, real estate, and quantitative analysis).

The working groups screen each proposal according to the evaluation criteria set forth in 2010 RFP Document. PSE reviewed both the qualitative and quantitative attributes of a proposal, including price, development and construction status, commercial terms, environmental impacts, permitting issues, real estate, technical considerations, operating characteristics, transmission and interconnection,

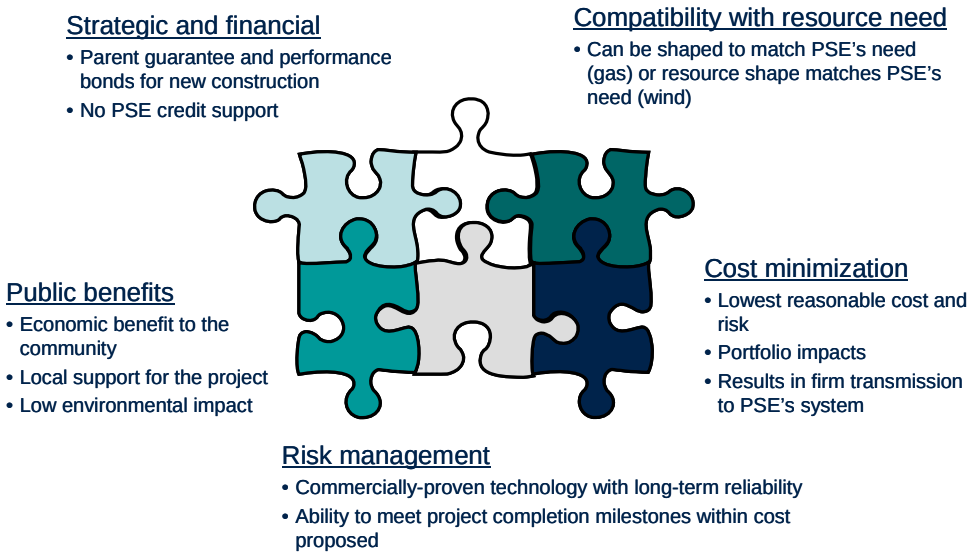
community impacts and project-specific economic analysis. *See generally* Exhibit No. ___(AS-3HC).

Q. What evaluation criteria did PSE use during the evaluation process?

A. In general, PSE prefers offers that benefit customers by complementing PSE's resource and timing needs, minimizing cost, minimizing risk, providing strategic and financial benefits, and providing additional public benefits. Each of these evaluation criteria contains a set of sub-criteria or guidelines that specify PSE's preferences for a successful proposal.

Figure 1 below provides a summary of the primary evaluation criteria employed by PSE in the evaluation process.

Figure 1. Summary of Primary Evaluation Criteria



Please see Exhibit No. ___(AS-3HC) at 27-31 and 102-113 for a discussion of the primary evaluation criteria.

Q. How did PSE apply the qualitative criteria?

A. For each proposal, individual working groups sought particular information related to their areas of expertise to identify any fatal flaws or areas of concern, as well as any associated benefits. These working groups documented their findings with the teams. For example, members of the commercial and development working group met weekly to discuss the proposals with certain key elements in mind, such as the viability of the project, counterparty risk, commercial terms and whether the development timeline was realistic. Other working groups asked different questions, such as:

- Does the project have permits, fuel supply agreements and transmission and interconnection agreements in place? If

not, can they reasonably be obtained in time to meet the commercial online date?

- Does the project proponent have site control?
- What are the operational or technology risks?
- Are there risks associated with public opposition or sensitive environmental habitat?
- What are the costs associated with the proposal, and how do the benefits and costs compare with other proposals?

See also Exhibit No. ___(AS-3HC) at 28.

Q. What other resources did PSE use in the evaluation process?

A. PSE retained DNV Global Energy Concepts Inc. to perform a review of the wind proposals that initially appeared most promising from a quantitative perspective. This third-party review of the proposed wind resources is an important part of the due diligence phase because the quality of wind resource reports provided with the wind proposals vary significantly. DNV Global Energy Concepts Inc.'s review of the proposals allowed PSE to evaluate wind resources based on a common set of assumptions.

PSE also retained Shaw Group to perform a review of the biomass proposals that appeared most promising considering all quantitative and qualitative factors. This third party review brought current knowledge of the biomass energy project development, biomass firing and power generation equipment, and pollution

control and air permitting requirements and pending legislation to PSE's review process.

Q. How did PSE apply the quantitative criteria?

A. PSE used the Portfolio Screening Model ("PSM" or "Screening Model"), a deterministic quantitative analysis model, to identify proposals with prohibitively high costs. PSE based the Screening Model on the 2009 IRP modeling methodology that identified a 20-year projected portfolio of generating resources PSE could acquire to meet future load, capacity and renewable energy credit ("REC") requirements.

Q. What does the Screening Model forecast?

A. The Screening Model forecasts an updated portfolio cost, based on the recommended generic resource acquisitions. The portfolio cost is derived from a series of cost projections, including but not limited to capital cost of resources, gas prices, market price for power purchase and sales, market price for REC sales, transmission cost, operation and maintenance costs and available tax incentives. These cost projections represent PSE's forecast of what it would cost to acquire typical (or "generic") resources to meet PSE's resource need. The Screening Model simulates the impact on portfolio economics of replacing a "generic" resource with a specific proposal from the 2010 RFP.

Q. What metrics does the Screening Model calculate to assess the economic viability of individual proposals?

A. The Screening Model calculates three metrics used by PSE to assess the economic viability of individual proposals:

(i) **Levelized Cost** is calculated by taking the specific resource's net present value revenue requirement over the 20-year analytic period with end effects, divided by the net present value generation. The levelized cost is measured on a dollar per megawatt-hour ("MWh") basis and represents the cost of each MWh over the life of the project.

(ii) **Portfolio Benefit** is the difference between the net present value portfolio revenue requirement with a proposed project, and the net present value portfolio revenue requirement of the generic portfolio strategy. A positive portfolio benefit means that the proposed project yields lower cost to the portfolio than a comparable "generic" resource. A negative portfolio benefit indicates the proposed resource is more expensive than a generic resource.

(iii) **Portfolio Benefit Ratio** represents the portfolio benefit divided by the present value of the proposed project revenue requirement. The portfolio benefit ratio allows projects of different capacities to be evaluated by removing bias for size. In other words, a proposed resource with a large capacity will typically have a large impact on the portfolio benefit metric. Similarly, a proposed resource with a small capacity will typically have a small impact on portfolio benefit. By dividing the portfolio benefit by the proposed project's net present value revenue requirement, the size impact of a particular project is mitigated.

Each metric offers a slightly different perspective on the economic benefits associated with each proposal. PSE considers all three metrics when comparing resources. *See, e.g.,* Exhibit No. ____(AS-3HC) at 28-29 and 157-160.

Q. How did the working groups work together to discuss the risks and merits of each individual proposal?

A. Each week, the RFP evaluation team met to discuss the risks and merits of the proposals. To ensure a thorough discussion of each proposal, team members were encouraged to ask questions and to discuss the findings of other groups. Based on the combined findings of the working groups, the RFP evaluation team made recommendations to either continue to evaluate proposals in greater detail or cease due diligence on a proposal due to fatal flaws, high risks or unfavorable economics. Examples of such flaws included:

- Project is not viable as proposed;
- Unacceptable risk associated with counterparty, commercial terms, development schedule, technology, permitting, etc.;
- No transmission or interconnection proposed and no clear solution available to ensure commercial operation date by date needed; and
- Project costs are high relative to other alternatives.

Following the weekly meeting, working groups submitted data requests to bidders seeking answers to outstanding questions or concerns related to proposals not eliminated during the initial screening. Once a working group completed its evaluation of a particular proposal, they prepared a memo or submitted comments to the RFP evaluation team summarizing their findings, with particular attention paid to the merits and risks of the proposal and any outstanding questions or areas of concern.

Q. Did the RFP evaluation team identify a list of the most promising resources for further quantitative analysis and targeted qualitative evaluation?

A. Yes. Upon completing the initial screening, the RFP evaluation team identified the most promising resources for further quantitative analysis and more targeted qualitative evaluation in Phase II (i.e., the Candidate Short List). The selected proposals were generally those identified as having a lower cost and less risk than other alternatives. *See, e.g.,* Exhibit No. ____(AS-3HC) at 39 (Candidate Short List for renewable resource proposals) and 58 (Candidate Short List for capacity resource proposals).

Q. What further qualitative analysis did PSE employ for those proposals selected for the candidate short list?

A. PSE subjected the proposals selected for the respective Candidate Short Lists to more rigorous examination during Phase II. This second phase is typified by greater interaction with the respondents and additional quantitative analysis, designed to support a deeper understanding of the proposals and their potential performance within PSE's portfolio. The working groups had an opportunity to contact respondents regarding outstanding or unclear data request responses, potential commercial terms and any other open issues.

Q. What further quantitative analysis did PSE employ for those proposals selected for the candidate short list?

A. The quantitative working group employed its portfolio optimization model ("PSM III" described as the "Optimization Model"), a mixed integer linear optimization model based on the revenue requirement model used in the initial screening, to perform more in-depth quantitative due diligence. The Optimization Model finds the minimum portfolio revenue requirement based on generic and specific resources that meets PSE's annual capacity need and annual REC need under the Washington renewable portfolio standard (the "RPS"). *See, e.g.,* Exhibit No. ____(AS-3HC) at 161-162.

Q. Please explain the differences between the Screening Model and the Optimization Model.

A. There are several key differences between the Screening Model and the Optimization Model. The Screening Model calculates project economics for individual RFP proposals compared to the cost of a "generic" resource, whereas the Optimization Model automatically creates new portfolios of resources proposed in the 2010 RFP by minimizing revenue requirement while meeting PSE's renewable and capacity need. The Screening Model has a simple-hourly dispatch function to simulate resource generation, whereas the Optimization Model uses the AURORA model to simulate dispatch of resources, using the

expected cost, revenues, and generation of the dispatch from AURORA. *See, e.g.*, Exhibit No. ____(AS-3HC) at 157-162.

Q. Does PSE conduct scenario analysis with the Optimization Model?

A. Yes. PSE used a variety of cost and risk variables associated with multiple potential futures, resource combinations and the timing of resource additions. PSE uses the Optimization Model to reflect the impacts that these different scenarios have on resource selections and revenue requirements. For Phase II, PSE used the following four scenarios from the 2009 IRP to simulate these uncertainties: Trends 2010, Business as Usual ("BAU"), Green World ("GW") and Low Growth ("LG"). PSE also added a new scenario, Low Growth with Trends 2010 capital costs ("LG + Trends 2010 Capital Cost"). Table 2 below summarizes the assumptions associated with each 2009 IRP scenario.

Table 2. Optimization Model Scenario Assumptions

Scenario	Load Growth	Natural Gas Prices	CO2 Prices	Resource Capital Costs
Trend 2010	Base	Base	Base	Base
Business as Usual (BAU)	Base	Base	Low	Base
Green World (GW)	Low	High	High	High
Low Growth (LG)	Low	Low	Low	Low
LG + Trends 2010 Capital Cost	Low	Low	Low	Base

See, e.g., Exhibit No. ____(AS-3HC) at 163.

PSE added the last scenario (LG + Trends 2010 Capital) for the Phase II analysis of renewable resources the Renewable Evaluation Phase II analysis because the

capital cost assumptions for a generic wind project used in the LG scenario are about 15% lower than the LSR Phase 1 capital costs. PSE wanted to test an additional scenario that used low economic growth but started with current capital costs for resources and sustained these levels on a real dollar basis. PSE added this scenario for the following three reasons:

1) LSR Phase 1 already captures low wind turbine and balance of plant construction costs;

2) commodity prices are beginning to rise again as the global economy recovers from the world-wide economic recession of 2008 and 2009 and it was hard to believe that the total cost to build a wind farm could fall an additional 15% from current prices; and

3) federal tax incentives available through 2012 and state RPS requirements will keep wind development demand at a higher level than they would be without those incentives.

See, e.g., Exhibit No. ___(RG-13HC) at 202-203.

Q. Did the 2010 RFP evaluation team develop a recommended short list?

A. Yes. The RFP evaluation team held a final working group meeting to review their findings and to recommend a final short list. Those proposals selected for the recommended short list were those with the lowest reasonable cost and risk that best complement PSE's resource and timing needs. *See* Exhibit No. ____(AS-3HC) at 114-150 for an executive summary of findings that outlines the qualitative risks and advantages, quantitative metrics, as well as each proposal's selection status and the rationale for that selection status.

III. 2010 RFP EVALUATION FOR RENEWABLE RESOURCES

A. Determination of the Cost-Effective Level of Renewables to Meet PSE's Renewable Resource Need

1. The 2009 IRP Projected that PSE Could Cost-Effectively Develop or Acquire 300 MW of Wind Resources

Q. Was PSE's renewable resource needs identified in the 2009 IRP?

A. Yes. The 2009 IRP identified an incremental renewable resource need of approximately 81 average megawatts ("aMW") by 2016 and 261 aMW by 2020. *See* Exhibit No. ___(RG-3) at 81. To meet this need, the 2009 IRP identified total renewable resource additions of 1,020 MW by 2020 (1,000 MW of additional wind resources and 20 MW of biomass resources). *See* Exhibit No. ___(RG-3) at 10. Of this 1,020 MW total, the 2009 IRP identified 600 MW of cost effective additional wind resources by 2016 (300 MW added by 2012 and a cumulative total of 600 MW added by 2016.) *See* Exhibit No. ___(RG-3) at 10.

Q. Did the 2009 IRP Addendum affect the renewable resource needs identified in the 2009 IRP?

A. No. The 2009 IRP Addendum updated the capacity need identified in the 2009 IRP but did not affect the renewable resource need identified in the 2009 IRP. *See generally* Exhibit No. ___(RG-4).

2. Market Place Changes After the 2009 IRP Encourage New Modeling to Determine the Cost-Effective Level of Renewables to Meet PSE's Renewable Resource Need

Q. Did PSE reassess the cost-effective level of renewables identified in the 2009 IRP to meet its renewable resource need?

A. Yes. PSE did reassess the cost effective level of renewables after identifying the following three material changes that could have an effect on the results generated in the 2009 IRP:

(i) the American Recovery and Reinvestment Act of 2009 included a cash grant from the U.S. Treasury ("Section 1603 Treasury Grant");

(ii) extension of the Washington renewable generation sales and use tax exemption; and

(iii) declines in wind turbine generator pricing due to the effects of the global financial crisis.

Please see the Prefiled Direct Testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), for a discussion of the three material changes identified above.

3. Analyses Subsequent to the 2009 IRP Projected that PSE Could Cost-Effectively Develop or Acquire 600 MW of Wind Resources

Q. How did PSE reevaluate the cost-effective level of renewable resources that it could add to meet its need?

A. After the completion of the 2009 IRP, PSE conducted additional analyses to assess the impact of federal and state incentives available to renewable resources and changes in the market for such resources. PSE used the following three quantitative models to identify the cost-effective level of renewable resources that it could add:

i) a simple discounted cash flow analysis;

ii) re-run of the 2009 IRP in the PSM II Model used during the 2009 IRP; and

iii) comparative analysis of renewable resources as part of its 2010 RFP processes using the Optimization Model.

a. Discounted Cash Flow Analysis

Q. What was the first quantitative model used by PSE to identify the wind capacity that can be developed economically?

A. The first alternative quantitative model used by PSE to identify the wind capacity that can be developed economically was a discounted cash flow ("DCF") model. This model only considered capital cost, the Section 1603 Treasury Grant, and REC sales. The purpose of this analysis was to identify the amount of wind PSE could build economically by December 31, 2012, to take advantage of available

tax incentives, while minimizing the revenue requirement associated with building 1,000 MW of wind necessary for PSE to meet Washington's RPS in 2020. See Exhibit No. ___(RG-13HC) at 177-179 for a description of the DCF model.

Table 3 presents the different wind build schedules used for the DCF model.

Table 3. Wind Build Schedule for DCF Model

Annual MW Development										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
LSR 7-28-09 Development Plan	0	250	250	0	0	250	0	0	0	250
Accelerated 500 Development, then IRP	0	500	0	0	0	100	0	200	0	200
IRP Development Plan	0	300	0	100	0	200	0	200	0	200
Phase 400 MW Development – then IRP	0	200	200	0	0	200	0	200	0	200
Phase 500 in 2 yrs – then IRP	0	250	250	0	0	100	0	200	0	200
Phase 600 MW Development – then IRP	0	300	300	0	0	0	0	200	0	200
Phase 800 MW Development – then IRP	0	400	400	0	0	0	0	0	0	200
Phase 1000 MW Development – then IRP	0	500	500	0	0	0	0	0	0	0
Phase 1200 MW Development – then IRP	0	600	600	0	0	0	0	0	0	0

See Exhibit No. ___(RG-13HC) at 178. Many of the build schedules accelerate the wind additions to take advantage of the tax incentives and lower turbine pricing in the near term, and then echo the wind acquisition plan of the 2009 IRP in years 2018 and 2020.

Q. How did PSE compare the alternative wind build schedules?

A. PSE modeled the cash flows for the nine wind build schedules shown in Table 3 and compared the net present value revenue requirement from each. Table 4 presents the analytic results from the DCF model.

Table 4. DCF Model Results

Plan No.	DCF Model Results	NPV Revenue Requirement	Incremental Cost from Lowest Cost Wind Build Scenario	Rank, Lowest Cost to Highest
1	LSR 7-28-09 Development Plan	$2,003,366	$42,944	5
2	Accelerated 500 Development – then IRP	$2,041,739	$81,318	7
3	IRP Development Plan	$2,064,358	$103,936	8
4	Phase 400 MW Development – then IRP	$2,000,299	$39,878	4
5	Phase 500 in 2 yrs. – then IRP	$1,980,360	$19,939	3
6	Phase 600 MW Development – then IRP	$1,960,422	$0	1
7	Phase 800 MW Development – then IRP	$1,964,173	$3,752	2
8	Phase 1000 MW Development – then IRP	$2,006,791	$46,369	6
9	Phase 1200 MW Development – then IRP	$2,083,704	$123,282	9

See Exhibit No. ___(RG-13HC) at 179.

Table 4 above presents each of the wind build schedules and the total net present value revenue requirement associated with each schedule, presented in thousands of dollars. The column to the right of the total net present value revenue requirement is the incremental revenue requirement from the wind build schedule that has the lowest net present value revenue requirement.

Q. What are the results of the DCF Model?

A. The results of the DCF model highlight two key points:

i) building wind resources early in advance of PSE's RPS need to capture the available economic benefits, outweighs the opportunity costs of letting those economic benefits lapse; and

ii) the most economic wind resources build schedule adds a total 600 MW of wind to PSE's resource portfolio by the end of the year 2011 and 2012.

See Exhibit No. ___(RG-13HC) at 179.

b. Re-run of the 2009 IRP

Q. What was the second alternative quantitative model used by PSE to identify the wind that can be developed economically?

A. To further refine the lowest cost development schedule of the Lower Snake River Wind Project, PSE re-ran the IRP models with updated wind turbine generator capital cost assumptions and using Section 1603 Treasury Grant instead of the PTCs assumed in the 2009 IRP. For this second modeling approach, PSE used the PSM II Model to re-run the 2009 IRP results. See Exhibit No. ___(RG-3HC) at 179-183 for a description of the PSM II Model. For this analysis, two IRP scenarios were used – 2009 Trends and Business As Usual ("BAU"). The 2009 Trends was the IRP base case scenario used to identify the recommended 20-year resource strategy for PSE. *See* Exhibit No. ___(RG-13HC) at 179-183.

PSE evaluated eight wind build schedules totaling 1,000 MW by 2020 through 2009 Trends and BAU in the PSM II Model to find the maximum amount of wind capacity that PSE could build economically while minimizing the total resource portfolio cost for the next 20 years.

Table 5 below is the wind capacity builds for the eight schedules.

Table 5. PSM II Model Wind Build Schedule

Plan no.	Wind Build Schedule	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	LSR 7-28-09 Development Plan	0	0	250	250	0	0	250	0	0	0	250	0	0
2	Accelerated 500 MW – then IRP	0	0	500	0	0	0	100	0	200	0	200	0	0
3	2009 IRP Resource Plan	0	100	200	0	100	0	200	0	200	0	200	0	0
4	Phase 400 MW – then IRP	0	0	200	200	0	0	200	0	200	0	200	0	0
5	Phase 500 MW – then IRP	0	0	250	250	0	0	100	0	200	0	200	0	0
6	Phase 600 MW – then IRP	0	0	300	300	0	0	0	0	200	0	200	0	0
7	2009 Trends	0	100	200	0	0	0	100	0	0	0	600	0	0
8	No Early Wind	0	0	0	0	0	0	400	0	0	0	600	0	0

See Exhibit No. ___(RG-13HC) at 180.

Q. What were the results of the re-run of the 2009 IRP?

A. Table 6 below presents the results for both the 2009 Trends and the BAU IRP scenarios.

Table 6. PSM II Model Build Schedule Ranking

		2009 Trends			Business as Usual		
Plan no.	Wind Build Schedule	NPV Portfolio Cost	Incremental NPV Portfolio Cost from Lowest Cost Scenario	Rank	NPV Portfolio Cost	Incremental NPV Portfolio Cost from Lowest Cost Scenario	Rank
1	LSR 7-28-09 Development Plan	$19,454,371	$42,214	4	$13,053,444	$46,077	4
2	Accelerated 500 MW – then IRP	$19,453,221	$41,063	3	$13,050,692	$43,324	3
3	2009 IRP Resource Plan	$19,533,805	$121,648	7	$13,143,441	$136,074	7
4	Phase 400 MW – then IRP	$19,478,149	$65,991	5	$13,090,288	$82,921	5
5	Phase 500 MW – then IRP	$19,445,152	$32,995	2	$13,048,828	$41,461	2
6	Phase 600 MW – then IRP	$19,412,157	$0	1	$13,007,367	$0	1
7	2009 Trends	$19,479,380	$67,222	6	$13,119,821	$112,453	6
8	No Early Wind	$19,565,828	$153,670	8	$13,237,954	$230,587	8

See Exhibit No. ___(RG-13HC) at 181.

Table 6 identifies the net present value portfolio cost in thousands of dollars for each wind build schedule in each scenario and ranks each schedule from lowest to highest cost in each scenario. Similar to the DCF modeling approach, both 2009 Trends and BAU IRP scenarios conclude that building 600 MW of wind by December 31, 2012 minimizes portfolio cost.

c. Comparative Analysis of Renewable Resources as Part of its 2010 RFP Processes, Renewable Evaluation

Q. What was PSE's third quantitative model it used to identify the wind that can be developed economically?

A. Although not part of the initial analysis to define the best development or acquisition plan for renewable resources, PSE conducted a comparative analysis of renewable resources as part of its 2010 RFP processes. PSE's Optimization Model, used to conduct its 2010 RFP Phase II analysis, indicates that it is cost effective to acquire even more renewable generation earlier than needed to meet RPS requirements. This modeling approach differs from those above because the projects tested are real proposals from the 2010 RFP and are in various stages of development. The optimization results from the five future scenarios discussed in the 2010 RFP comparative analysis show a range of 346,000 RECs to 2,954,000 RECs in 2016, which is equivalent to 132 MW to 987 MW of wind capacity assuming a standardized 30% capacity factor. For one MWh of wind generation one REC is produced. Please note that the wind capacities presented in this

Section III.A. of this testimony do not take into account the apprentice labor 1.2 REC multiplier.

Q. What were the results of the 2010 RFP renewable evaluation process?

A. Table 7 below details the range of RECs and MW equivalents of this analysis.

Table 7. Renewable Portfolio Optimization

	Scenario Optimizations				
Proposed Project	**Trends 2010**	**BAU**	**GW**	**LG**	**LG With Base Capital Costs**
LSR Phase 1	**X**	**X**	**X**		**X**
[redacted] (Unsolicited)	**X**	**X**	**X**	**X**	**X**
[redacted] (#10075-a)	**X**	**X**	**X**		**X**
[redacted] (#10117-a)			**X**		
[redacted] (#10117-b)	**X**		**X**		
RECs from Wind Acquisition	2,283,884	1,954,858	2,593,988	346,265	1,954,858
Equivalent MW Wind 30% CF	869	744	987	132	744

See Exhibit No. ___(RG-13HC) at 182. The columns in Table 7 above are the five future scenarios discussed in the 2010 RFP comparative analysis, and the rows are the proposed projects. The "X" marks a scenario in which the Optimization Model selected the proposed project.

d. Alternative Quantitative Modeling Supported the Development of up to 600 MW of Wind by December 31, 2012

Q. What do the modeling approaches suggest with respect to the lowest cost wind resource portfolio?

A. Based on the quantitative analysis prior to the RFP, the DCF analysis, and the re-run of the 2009 IRP, the alternative quantitative modeling suggested that PSE could achieve a cost effective wind resource portfolio by building up to 600 MW of wind by December 31, 2012 (500 MW if apprentice labor is used). PSE's 2010 RFP comparative analysis using specific wind resources bid, suggests 744 MW of wind resources (620 MW if apprentice labor is used).

B. 2010 RFP Phase I Renewable Resource Evaluation Results

Q. What was the goal of the renewable resource evaluation conducted in Phase I from March to Mid-April 2010?

A. As described above, PSE evaluated RPS eligible renewable resources first with the intent to identify the lowest reasonable cost and risk renewable resources by mid-April 2010. This timing would allow renewable resources in development the opportunity to qualify for the Section 1603 Treasury Grant.

Q. What types of resources did PSE evaluate during the renewable evaluation?

A. PSE reviewed biomass, wind, solar, and unbundled REC proposals that provided qualifying renewable generation to meet the Washington RPS.

1. 2010 RFP Phase I Results for Biomass Proposals

Q. How did biomass resource proposals submitted in response to the 2010 RFP evaluate in Phase I of the evaluation process?

A. Biomass resource proposals tended to evaluate favorably in PSE's quantitative models because these projects meet PSE's renewable and capacity needs. Table 8 below presents the 2010 RFP Phase I quantitative results for biomass resource proposals.

Table 8. Quantitative 2010 RFP Phase I Results for Biomass Resource Proposals

Project	State	Type	Size (MW)	NCF Analyzed	Benefit Ratio	Portfolio Benefit ($000)	Levelized $/MWh
[redacted] (#10063)	WA	PPA	[redacted]	[redacted]	**0.22**	**4,195**	[redacted]
[redacted] (#10009)	WA	PPA	[redacted]	[redacted]	**0.13**	**19,248**	[redacted]
[redacted] (#10025)	OR	PPA	[redacted]	[redacted]	**0.11**	**19,732**	[redacted]
[redacted] (#10161)	OR	PPA	[redacted]	[redacted]	**0.09**	**16,010**	[redacted]
[redacted] (#10163)	WA	PPA	[redacted]	[redacted]	**0.05**	**20,237**	[redacted]
[redacted] (#10121-a)	OR	PPA	[redacted]	[redacted]	**0.01**	**3,239**	[redacted]
[redacted] (#10086)	MT	Own	[redacted]	[redacted]	**(0.15)**	**14,592**	[redacted]
[redacted] (#10109)	WA	PPA	[redacted]	[redacted]			
[redacted] (#10058)	TBD	TBD	[redacted]	[redacted]			

See also Exhibit No. ___(RG-13HC) at 194.

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The projects listed in Table 8 are in descending order by benefit ratio. Proposals with higher portfolio benefits, higher benefit ratios, and lower levelized costs are more attractive.

The biomass proposals received in response to the 2010 RFP, however, are in early stages of development. Some of the proposals are only at a conceptual stage, and some of the proposals contain significant development and fuel-source risk. *See* Exhibit No. ___(AS-3HC) at 185-186.

2. <u>2010 RFP Phase I Results for Wind Proposals</u>

Q. How did wind resource proposals submitted in the 2010 RFP evaluate in Phase I of the evaluation process?

A. The wind resource proposals received in response to the 2010 RFP represented the full spectrum of development, construction and commercially operating projects.

Table 9 on the following page presents the 2010 RFP Phase I quantitative results for wind resource proposals.

Table 9. Quantitative 2010 RFP Phase I Results for Wind Resource Proposals

Project	State	Type	Size (MW)	NCF Analyzed	Benefit Ratio	Portfolio Benefit ($000)	Levelized $/MWh
[redacted] (#10014)	WA	Own	[redacted]	[redacted]	**0.14**	**28,314**	[redacted]
[redacted] (Unsolicited)	OR	PPA	[redacted]	[redacted]	**0.14**	**35,488**	[redacted]
LSR Phase 1 – PSE Self-Build	WA	Own	342.7	[redacted]	**0.09**	**68,773**	[redacted]
[redacted] (#10075-a)	WA	Own	[redacted]	[redacted]	**0.05**	**18,556**	[redacted]
[redacted] (#10117-a)	WA	PPA	[redacted]	[redacted]	**0.01**	**3,161**	[redacted]
[redacted] (#10075-b)	WA	Own	[redacted]	[redacted]	**0.01**	**4,394**	[redacted]
[redacted] (#10148)	WA	Own	[redacted]	[redacted]	**0.00**	**333**	[redacted]
[redacted] (#10117-b)	OR	PPA	[redacted]	[redacted]	**(0.03)**	**(8,698)**	[redacted]
[redacted] (#10100)	OR	Own	[redacted]	[redacted]	**(0.04)**	**(7,066)**	[redacted]
[redacted] (#10049)	WA	PPA	[redacted]	[redacted]	**(0.06)**	**(5,171)**	[redacted]
[redacted] (#10150)	MT	Dev	[redacted]	[redacted]	**(0.06)**	**(11,085)**	[redacted]
[redacted] (#10147)	OR	PPA	[redacted]	[redacted]	**(0.11)**	**(92,672)**	[redacted]
[redacted] (#10016)	WA	PPA	[redacted]	[redacted]	**(0.12)**	**(20,292)**	[redacted]
[redacted] (#10152-a)	MT	PPA	[redacted]	[redacted]	**(0.12)**	**(71,399)**	[redacted]
[redacted] (#10120-b)	WA	PPA	[redacted]	[redacted]	**(0.14)**	**(34,884)**	[redacted]
[redacted] (#10120-a)	WA	PPA	[redacted]	[redacted]	**(0.16)**	**(40,911)**	[redacted]
[redacted] (#10152-b)	MT	PPA	[redacted]	[redacted]	**(0.16)**	**(92,832)**	[redacted]
[redacted] (#10105-d)	MT	Own	[redacted]	[redacted]	**(0.19)**	**(14,238)**	[redacted]
[redacted] (#10162-a)	MT	Own	[redacted]	[redacted]	**(0.20)**	**(59,813)**	[redacted]
[redacted] (#10162-b)	MT	PPA	[redacted]	[redacted]	**(0.20)**	**(60,793)**	[redacted]
[redacted] (#10136)	MT	PPA	[redacted]	[redacted]	**(0.20)**	**(51,137)**	[redacted]
[redacted] (#10080)	MT	PPA	[redacted]	[redacted]	**(0.22)**	**(84,357)**	[redacted]
[redacted] (#10108-b)	WA	PPA	[redacted]	[redacted]	**(0.25)**	**(27,915)**	[redacted]
[redacted] (#10105-a)	MT	Own	[redacted]	[redacted]	**(0.30)**	**(20,470)**	[redacted]
[redacted] (#10108-a)	WA	PPA	[redacted]	[redacted]	**(0.31)**	**(7,156)**	[redacted]

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Table 9. Quantitative 2010 RFP Phase I Results for Wind Resource Proposals (contd.)

Project	State	Type	Size (MW)	NCF Analyzed	Benefit Ratio	Portfolio Benefit ($000)	Levelized $/MWh
[redacted] (#10108-c)	WA	PPA	[redacted]	[redacted]	**(0.32)**	**(44,809)**	[redacted]
[redacted] (#10096)	MT	Wind		[redacted]			
[redacted] (#10004)	BC	PPA	[redacted]				
[redacted] (#10015)	WA	Wind	[redacted]				

See also Exhibit No. ___(RG-13HC) at 199.

3. 2010 RFP Phase I Results for REC Proposals

Q. How did REC proposals submitted in the 2010 RFP evaluate in Phase I of the evaluation process?

A. PSE received two unbundled REC proposals with a total of five offers. Table 10 below presents the 2010 RFP Phase I quantitative results for REC proposals.

Table 10. Quantitative 2010 RFP Phase I Results for Wind Resource Proposals

Project	State	Type	P50 Annual RECs	NCF Analyzed	Benefit Ratio	Portfolio Benefit ($000)	Levelized $/MWh
[redacted] REC (#10059-b)	ID	PPA	[redacted]	N/A	**2.26**	**14,224**	[redacted]
[redacted] REC (#10059-a)	ID	PPA	[redacted]	N/A	**(0.46)**	**(1,789)**	[redacted]
[redacted] REC (#10053-b)	ID	PPA	[redacted]	N/A	**(1.73)**	**(2,687)**	[redacted]
[redacted] REC (#10053-c)	ID	PPA	[redacted]	N/A	**(1.78)**	**(5,154)**	[redacted]
[redacted] REC (#10053-a)	ID	PPA	[redacted]	N/A	**(4.03)**	**(12,408)**	[redacted]

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See also Exhibit No. ___(RG-13HC) at 199. The REC proposals offered are both from existing and yet-to-be constructed renewable projects.

4. 2010 RFP Phase I Results for Solar Resource Proposals

Q. How did the solar resource proposal submitted in the 2010 RFP evaluate in Phase I of the evaluation process?

A. PSE only received one proposal for a solar project. Table 11 below presents the 2010 RFP Phase I quantitative results for solar resource proposals.

Table 11. Quantitative 2010 RFP Phase I Results for Solar Resource Proposals

Project	State	Type	Size (MW)	NCF Analyzed	Benefit Ratio	Portfolio Benefit ($000)	Levelized $/MWh
[redacted] (#10122)	OR	PPA	[redacted]	[redacted]	**(0.43)**	**(16,306)**	[redacted]

See also Exhibit No. ___(RG-13HC) at 199.

5. 2010 RFP Phase I Selected Candidate Short List

Q. What renewable resources evaluated in the 2010 RFP did PSE select for Phase II?

A. From among the 2010 RFP renewable resource proposals, the LSR Phase I project, and [redacted] (Unsolicited), the RFP Evaluation Team identified nine projects to evaluate further in the Phase II, candidate short list. The nine projects represent the most favorable resources from both a qualitative and

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quantitative perspective from each resource type. Table 12 below presents the Candidate Short List.

Table 12. 2010 RFP Phase 1 Candidate Short List for Renewable Resources

2010 RFP, Phase I Proposal Selected for Additional Due Diligence						Phase I: Quantitative Screening		
Proposal ID	**Proposal**	**Technology Type**	**Size MW**	**P50 Annual RECs**	**On-line Year**	**Portfolio Benefit Ratio**	**Portfolio Benefit ($MM)**	**Levelized Cost $/MWh**
Self build and Unsolicited proposal								
	Lower Snake River Phase 1	Wind	342.7	[redacted]	2012	0.09	68.8	[redacted]
	[redacted] (Unsolicited)	Wind	[redacted]	[redacted]	[redacted]	0.14	35.5	[redacted]
2010 RFP Proposals								
10059	[redacted]	REC	[redacted]	[redacted]	[redacted]	2.26	14.2	N/A
10009	[redacted]	Biomass	[redacted]	[redacted]	[redacted]	0.13	19.2	[redacted]
10025	[redacted]	Biomass	[redacted]	[redacted]	[redacted]	0.11	19.7	[redacted]
10163	[redacted]	Biomass	[redacted]	[redacted]	[redacted]	0.05	20.2	[redacted]
10075-a	[redacted]	Wind	[redacted]	[redacted]	[redacted]	0.05	18.6	[redacted]
10117-a	[redacted]	Wind	[redacted]	[redacted]	[redacted]	0.01	3.2	[redacted]
10117-b	[redacted]	Wind	[redacted]	[redacted]	[redacted]	(0.03)	(8.7)	[redacted]

See also Exhibit No. ___(AS-3HC) at 39.

Q. Why does PSE report the P50 Annual RECs above?

A. PSE represents the P50 Annual REC contributions to compare unlike resources similarly. It is difficult to compare a wind project to a biomass project based on plant capacity alone because REC generation is dependent on each project's capacity factor. Biomass plants tend to have a larger net capacity factor than wind; therefore, a smaller capacity biomass plant can produce the same number of RECs as a larger capacity wind project. Moreover, a REC contract is different

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from both wind and biomass proposals because PSE receives only RECs and no power. Thus, RECs are the common factor across all renewable resources. PSE has a REC need of nearly 688,600 RECs in 2016, which is equivalent to approximately 78 aMW. *See* Exhibit No. ___(AS-3HC) at 40.

Q. Please discuss the renewable resource proposals not selected for the Candidate Short List.

A. PSE eliminated the renewable resource proposals projects not selected for the Candidate Short List from further review due to unacceptable commercial terms, technology risk, wind resource risk, and/or pricing. *See* Exhibit No. ___(AS-3HC) at 34-49. The findings for each project eliminated after Phase I are in PSE's executive summary from the renewable resource evaluation. *See* Exhibit No. ___(AS-3HC) at 114-133.

C. 2010 RFP Phase II Renewable Resource Evaluation Results

Q. What analysis did PSE undertake for renewable resources in the Phase II of the 2010 RFP?

A. In the 2010 RFP Phase II process for renewable resources, PSE performed additional quantitative and qualitative review of the proposals selected for the Candidate Short List. Due diligence activities included further inquiry via data requests and meetings with the respondents. PSE also completed additional modeling with the Optimization Model.

Q. What were the results of the quantitative analysis for renewable resources conducted by PSE in Phase II of the 2010 RFP?

A. Table 13 below presents the Optimization Model results of the RFP Phase II quantitative analysis for renewable resources.

Table 13. Alternative Portfolios to meet PSE's 2016 REC Need

Proposed Project	2010 RFP Scenarios				
	Trends 2010	BAU	GW	LG	LG With Base Capital Costs
LSR Phase 1	X	X	X		X
[redacted] (Unsolicited)	X	X	X	X	X
[redacted] (#10059-b) REC	X				
[redacted] (#10009)		X	X		
[redacted] (#10025)			X		
[redacted] (#10163)			X		X
[redacted] (#10075-a)	X	X	X		X
[redacted] (#10117-a)			X		X
[redacted] (#10117-b)	X		X		
Portfolio Cost	$13,992,578	$8,610,223	$18,253,665	$11,703,593	$11,180,096
Levelized Cost	$106.64	$112.49	$106.31	$102.85	$114.29
RECs from Wind Acquisition	2,283,884	1,954,858	2,593,988	346,265	1,984,858
Equivalent MW Wind 30% CF	869	774	987	132	744

As with Table 7 above, the columns in Table 13 are the five future scenarios discussed in the 2010 RFP comparative analysis, and the rows are the proposed projects. The "X" marks a scenario in which the Optimization Model selected the proposed project.

Q. Did the Optimization Model select renewable resources that provided more RECs than the 2016 stated need of 688,600?

A. Yes. The results illustrate that in four of the five scenarios analyzed, the Optimization Model selected wind and biomass resources that provide more RECs than the 2016 stated need of 688,600 RECs.

Q. What renewable resources does the Optimization Model indicate would be economically favorable to acquire?

A. The quantitative results of the Optimization Model indicate that it would be economically favorable for PSE to acquire LSR Phase I, [redacted] (Unsolicited) and [redacted] (#10075-a), selecting them in a minimum of four of the five scenarios.

Q. Do the results of the Optimization Model dictate the renewable resources that PSE must acquire?

A. No. Although the models suggest that a significant amount of renewable resources should be secured before the stated PSE 2016 REC need, neither the PSM nor the Optimization Model can distinguish between one project that is ready for construction and another that may not begin construction in time to qualify for the Section 1603 Treasury Grant. Because the quantitative results omit critical information about the proposals, PSE must conduct due diligence to

gain a more accurate perspective on project executability and the associated risks and use its experience to determine the success of each proposed project.

Q. Please summarize the Phase II results.

A. For the biomass proposals, the consensus on all projects was each had significant development risks, ranging from local community opposition, lack of a long-term fuel supply, uncertain emission cost risk due to EPA tailoring rule, and/or the inability to secure a financing or development partner. Biomass was also a poor performer quantitatively. In the Optimization Model, all three biomass projects were only selected once or twice out of the five scenarios and none of them were selected in Trends 2010, the portfolio PSE believed to be most representative of the then-current environment. The wind projects contributed more to minimizing portfolio costs because wind has no variable fuel cost associated with generation.

Although the [redacted] (#10059-b) REC proposal evaluated highly in Phase I, the Optimization Model selected it only once in five scenarios. Unbundled RECs, unlike biomass and wind resources, do not have additional attributes such as meeting PSE's capacity need or energy generation that can either be sold at market prices or offset market purchases of energy. Since the Optimization Model selects more renewable resources to acquire than is necessary for the 2016 need, the REC contract only adds additional cost to the portfolio. In other words, the REC proposal does not provide a sufficient amount of RECs to offset the need to acquire another resource. PSE generally views REC

contracts as more risky than typical PPA contracts because in the event that the counterparty for the purchased power should default, the integrity of PSE's REC contract could also be affected.

The wind proposals required more sophistication to determine whether their development schedule was achievable to meet the then-applicable safe harbor provision of Section 1603 Treasury Grant that each project relied upon. For example, although [redacted] (#10075-a) appeared to be a mature project with an unappealable permit, the project still required substantial development work to be completed before PSE would consider entering into definitive agreements. The RFP Evaluation Team learned that five of the six project land leases did not extend for the 25-year operating life of the wind farm and had no provisions for extension. For construction to commence, both a project lender and PSE would require those land leases to be extended with the landowners for the full operating life of the project. Similar challenges were seen with the other wind project proposals. See Exhibit No. ___(RG-13HC) at 42-48 for the complete evaluation of the resources considered in Phase II.

Q. Did PSE summarize the development risk of each of the wind proposals?

A. Yes. One of the key evaluation tools used in Phase II to determine the development risk and readiness of a project to meet it proposed development schedule was the project development matrix. The tool provides a comparison of each project's progress in the following areas: the wind resource assessment;

securing the project site; interconnection and transmission; equipment, permitting, and design work schedules meeting the then-applicable provisions of the Section 1603 Treasury Grant; and plans to use apprentice labor. *See* Exhibit No. ___(RG-13HC) at 41 and 216-217.

D. PSE Selected LSR Phase 1 for the Short List

Q. Please describe why LSR Phase 1 was the only renewable resource selected to the short list.

A. LSR Phase 1 was the only renewable resource selected to the short list for a variety of reasons, including but not limited to the following:

(i) LSR Phase 1 was the lowest reasonable cost, lowest reasonable risk renewable resource evaluated in or along side the 2010 RFP;

(ii) LSR Phase 1 was the only renewable resource evaluated in the 2010 RFP Phase II that was ready to start construction in 2010 to meet the safe harbor for the Section 1603 Treasury Grants;

(iii) LSR Phase 1 had a finalized large generator interconnection agreement with BPA for interconnection to the regional transmission grid;

(iv) LSR Phase 1 had confirmed firm transmission rights for 250 MW with a clear path for subsequent firm transmission;

(v) LSR Phase 1 had an unappealable permit and all permits necessary for construction;

(vi) LSR Phase 1 had all leases acquired and valid for a period beyond the 25-year operating life of the project;

(vii) LSR Phase 1 had all site engineering finalized, including all roads, collector systems, turbine foundations, turbine layout and substations;

(viii) LSR Phase 1 had final wind resource assessments, complete with a site suitability report from the wind turbine generator documenting that the Siemens 2.3 MW wind turbine generator is a strong fit for the project topography and wind resource; and

(ix) LSR Phase 1 had finalized definitive agreements, including without limitation a turbine supply agreement, a service and maintenance agreement, and a balance of plant agreement.

Given its readiness for construction and the final status of all necessary contracts, LSR Phase 1 had the least price risk and least execution risk among the nine proposals selected for further evaluation. Taken in totality with the results of the comparative evaluation, LSR Phase I was the resource best positioned to meet the then-applicable safe harbor provision of Section 1603 Treasury Grant and PSE's 2016 renewable resource need.

E. PSE Selected One Wind Proposal, One REC-Only Proposal and Three Biomass Proposals for Continuing Investigation during the Capacity Evaluation Phase II analysis

Q. What renewable resources did PSE select for the Continuing Investigation List during the capacity resource evaluation process?

A. The resource evaluation team kept the [redacted] (Unsolicited) proposal, the [redacted] (#10059-b) REC proposal, and three biomass projects on the Continuing Investigation List because the team needed additional time to better understand each of these projects.

Q. Why were all three biomass proposals selected for the Continuing Investigation List?

A. The RFP Evaluation Team kept all three biomass proposals– [redacted] [redacted] (#10009), [redacted] (#10025) and [redacted] (#10163)–on the Continuing Investigation List because additional time would provide the team with an opportunity to continue to monitor the progress of the developments. A more important reason to keep these projects on the Continuing Investigation List is that biomass plants count towards meeting PSE's capacity need as they can be run to meet peak winter load. Due to this important factor, PSE evaluated these proposals alongside the 2010 RFP capacity resource proposals.

Q. Why did the [redacted] (Unsolicited) proposal remain on the Continuing Investigation List?

A. [redacted] (Unsolicited) had favorable economics in the PSM and in the Optimization Model; however, the project faced several obstacles in its development schedule. This put the project at risk for its proposed execution schedule, which also put the price at risk due to the timing to qualify for the Section 1603 Treasury Grant at risk.

As of the time of the evaluation, the project

(i) had yet to attain an unappealable permit to construct the project;

(ii) did not have all the land leases in place to build the wind capacity proposed;

(iii) did not have a Record of Decision or Large Generator Interconnection Agreement from BPA for project interconnection;

(iv) had not completed enough engineering work due to the uncertainty around land necessary for the project; and

(v) faced community opposition.

With the uncertainty of the development schedule and price, the RFP Evaluation Team chose to continue to monitor the project by placing it on the Continuing Investigation List for inclusion in the final portfolio evaluation with the capacity resources during Phase II. This extra time allowed the team to continue discussions with the project developer in order to track the development status.

Q. Why did the [redacted] (#10059-b) REC proposal remain on the Continuing Investigation List?

A. The RFP Evaluation Team decided to keep the [redacted] (#10059-b) REC proposal on the candidate short list because the team wanted to continue to study the conflicting economic analyses from the 2010 RFP Phase I and Phase II, and to better understand the commercial terms and risks associated with this project.

F. Reevaluation of LSR Phase I

Q. Did PSE reevaluate LSR Phase 1 after selecting it to the short list?

A. Yes. Subsequent to the signing of the agreements, PSE received a number of new unsolicited and repriced 2010 RFP proposals. PSE's goal in reevaluating the renewable resources was twofold. First, PSE wanted to confirm that LSR Phase 1 remained the lowest reasonable cost and lowest reasonable risk renewable resource. Second, PSE wanted to analyze whether it should perform additional analysis or due diligence on the unsolicited offers or the repriced bids.

Q. How did PSE conduct the reevaluation of LSR Phase I?

A. PSE began the process of re-evaluating the unsolicited proposals and repriced 2010 RFP proposals in May 2010 and completed the evaluation by June 30, 2010. The reevaluation considered the termination costs for the existing LSR Phase I contracts as well as the various stages of development of the alternatives to evaluate construction risk. PSE reduced the cost of LSR Phase I by the termination costs instead of adding the costs to the projects involved in the comparison. See Exhibit No. ___(AS-3HC) at 473 for an explanation of the derivation of the termination costs for the existing LSR Phase I contracts.

Q. What were the quantitative results of this reevaluation?

A. Table 14 below shows the updated quantitative analysis in PSM. The incremental cost of LSR Phase 1 (total cost less termination cost) was lower than all other

renewable generation offers. Please see Exhibit No. ___(AS-3HC) at 472-479 for a copy of the results of such reevaluation, entitled "2010 RFP Renewable Results Update," dated June 30, 2010.

Table 14. Screening Results Reaffirm Selection of LSR Phase 1

Update	Project Name	Project ID	Type	Type	Capacity (MW)	Analyzed NCF	Benefit Ratio	BR Rank	Portfolio Benefit (Cost) $000	Levelized $/MWh
RFP CIL	[redacted]	10059	REC Only	PPA	---	N/A	2.26	1	14,224	N/A
Selected	LSR Phase 1 - Incremental	Self-Build	Wind	Own	343	[redacted]%	0.28	2	183,432	[redacted]
Unsol	[redacted]	Unsolicited	BioM	PPA	[redacted]	[redacted]%	0.21	3	26,164	[redacted]
Unsol	[redacted]	Unsolicited	Wind	PPA	[redacted]	[redacted]%	0.15	4	38,522	[redacted]
RFP CIL	[redacted]	10025	BioM	PPA	[redacted]	[redacted]%	0.11	5	20,942	[redacted]
Rebid	[redacted]	10163	BioM	PPA	[redacted]	[redacted]%	0.09	6	36,363	[redacted]
Unsol	[redacted]	Unsolicited	Wind	PPA	[redacted]	[redacted]%	0.09	7	37,042	[redacted]
Unsol	[redacted]	Unsolicited	Wind	PPA	[redacted]	[redacted]%	0.07	8	16,267	[redacted]
Unsol	[redacted]	Unsolicited	Wind	PPA	[redacted]	[redacted]%	0.06	9	20,470	[redacted]
Unsol	[redacted]	Unsolicited	Wind	Own	[redacted]	[redacted]%	0.05	10	17,556	[redacted]
Rebid	[redacted]	10075-a	Wind	PPA	[redacted]	[redacted]%	0.05	11	21,503	[redacted]
Rebid	[redacted]	10136	Wind	PPA	[redacted]	[redacted]%	0.03	12	7,002	[redacted]
Rebid	[redacted]	10117-b	Wind	PPA	[redacted]	[redacted]%	(0.01)	13	(2,925)	[redacted]
RFP CIL	[redacted]	10009	BioM	PPA	[redacted]	[redacted]%	(0.06)	15	(10,246)	[redacted]

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Table 14. Screening Results Reaffirm Selection of LSR Phase 1 (contd.)

Update	Project Name	Project ID	Type	Type	Capacity (MW)	Analyzed NCF	Benefit Ratio	BR Rank	Portfolio Benefit (Cost) $000	Levelized $/MWh
Unsol	[redacted]	Unsolicited	Wind	PPA	[redacted]	[redacted]%	(0.05)	14	(29,185)	[redacted]
Unsol	[redacted]	Unsolicited	Wind	PPA	[redacted]	[redacted]%	(0.19)	16	(76,470)	[redacted]
RFP CIL	= Original proposal as submitted. Project was placed on Renewable Resources Continuing Investigation List (CIL)									
Unsol	= Unsolicited proposal received after Board of Directors Approval to construct LSR Phase 1									
Rebid	= RFP proposal was repriced or modified after PSE notification that proposal was not selected for the Renewables Shortlist									

See Exhibit No. ___(AS-3HC) at 481.

Q. What were the qualitative results of this reevaluation?

A. Please see Exhibit No. ___(AS-3HC) at 476-478 for an updated development status of each of the potentially competitive wind project. The risks PSE identified for biomass and unbundled REC projects in the initial selection of LSR Phase I still are applicable; and therefore, PSE focused on the competitive wind proposals for the reevaluation.

The qualitative evaluation illustrates that LSR Phase 1 and [redacted] (unsolicited) are the only wind resources under construction with almost all development work finalized. This suggests that LSR Phase 1 and [redacted] (unsolicited) are best-positioned to reach commercial operation according to their

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stated project schedules and construction budgets. In relation to LSR Phase 1 and [redacted] (unsolicited), all other wind projects face more qualitative risks.

Q. What were the final conclusions from this reevaluation?

A. Although PSE received new and revised offers and some of the projects presented were in the later stages of development, the prices offered were not significantly lower or better than the offers PSE received in March in response to the 2010 RFP. The reevaluation only reaffirmed that LSR Phase 1 is the lowest reasonable cost and lowest risk renewable resource to meet the then-applicable safe harbor provision of Section 1603 Treasury Grant. Additionally, PSE decided to include the [redacted] (unsolicited), [redacted] (unsolicited), and the [redacted] (#10075-PPA) offers in the Phase II analysis with capacity resources. The quantitative models in the renewable evaluation continued to show that PSE should add renewable resources in advance of the 2020 renewable need.

IV. 2010 RFP EVALUATION FOR CAPACITY RESOURCES AND CONTINUING INVESTIGATION OF RENEWABLE RESOURCES

A. Determination of Need for Capacity Resources

Q. Was PSE's capacity resource need identified in the 2009 IRP?

A. Yes. The 2009 IRP identified a need for 676 MW of additional supply-side and demand-side capacity resources in 2012. *See* Exhibit No. ___(RG-3) at 8. PSE

subsequently issued a 2009 IRP Addendum that presented a revised forecast need for 934 MW of additional supply-side and demand-side capacity resources in 2012. *See* Exhibit No. ___(RG-4) at 8.

B. 2010 RFP Phase I Capacity Resource Evaluation Results

Q. What was the goal of Phase I Capacity Evaluation?

A. PSE screened the capacity resource proposals to find the most cost effective and viable projects available to meet PSE's near-term capacity need.

Q. What types of resources did PSE evaluate during the capacity evaluation?

A. PSE received proposals for hydro generation, natural gas-fired CCCT, natural gas-fired peaking resources, a system PPA, and a distributed generation resource. PSE also considered self-build opportunities and an unsolicited proposal in the evaluation of capacity resources. Because PSE screened the biomass projects during the evaluation of renewable resources, PSE did not include them in the evaluation of capacity resources in Phase I. PSE did, however, consider these resources in the evaluation of capacity resources in Phase II.

1. 2010 RFP Phase I Results for Natural Gas-Fired CCCTs

Q. How did natural gas-fired CCCT resource proposals evaluate in Phase I?

A. Proposals from operating natural gas-fired CCCT resources evaluated better both quantitatively and qualitatively than proposals from new build offers. *See* Exhibit

No. ___(AS-3HC) at 187-188 for a comparison of the development status of all natural gas-fired projects. Table 15 below presents the 2010 RFP Phase I quantitative results for natural gas-fired CCCT proposals.

Table 15. Quantitative 2010 RFP Phase I Results for Natural Gas-Fired CCCTs

Project	Project ID	State	Type	Operating Status	Capacity (MW. Winter)	Benefit Ratio	Portfolio Benefit (Cost) $000	Levelized $/MWh
[redacted]	10027a	OR	Toll	Operating	[redacted]	**0.41**	**55,899**	[redacted]
[redacted]	10027b	OR	Toll	Operating	[redacted]	**0.39**	**90,537**	[redacted]
[redacted]	10048	WA	Own	Operating	[redacted]	**(0.11)**	**(218,875)**	[redacted]
PSE Frederickson CCCT 7FA.05	Self-Build	WA	Own	New Build	346	**(0.11)**	**(129,429)**	**147**
[redacted]	10020	WA	Toll	Operating	[redacted]	**(0.12)**	**(36,946)**	[redacted]
[redacted]	10106	OR	Own	New Build	[redacted]	**(0.15)**	**(301,891)**	[redacted]
[redacted]	10159	WA	Own	New Build	[redacted]	**(0.17)**	**(160,773)**	[redacted]
[redacted]	10090	WA	Own	New Build	[redacted]	**(0.18)**	**(118,131)**	[redacted]
[redacted]	10164	WA	Toll	Operating	[redacted]	**(0.21)**	**(47,666)**	[redacted]
[redacted]	10083	WA	Own	New Build	[redacted]	**(0.23)**	**(250,421)**	[redacted]
[redacted]	10072-b	WA	Own	New Build	[redacted]	**(0.23)**	**(280,692)**	[redacted]
[redacted]	10067	WA	Toll	New Build	[redacted]	**(0.26)**	**(327,993)**	[redacted]
[redacted]	10067	WA	Toll	New Build	[redacted]	**(0.28)**	**(311,836)**	[redacted]
[redacted]	10153	WA	Own	New Build	[redacted]	**(0.28)**	**(277,918)**	[redacted]
[redacted]	10072-a	WA	Toll	New Build	[redacted]	**(0.38)**	**(535,715)**	[redacted]

See Exhibit No. ___(AS-3HC) at 54.

2. 2010 RFP Phase I Results for Natural Gas-Fired Peaking Resources

Q. How did natural gas-fired peaking resource proposals evaluate in Phase I?

A. Proposals from operating natural gas-fired peaking resources evaluated better both quantitatively and qualitatively than proposals from new build offers.

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Table 16 below presents the 2010 RFP Phase I quantitative results for natural gas-fired peaking resource proposals.

Table 16. Quantitative 2010 RFP Phase I Results for Natural Gas-Fired Peaking Resource Proposals

Project	Project ID	State	Type	Operating Status	Capacity (MW. Winter)	Benefit Ratio	Portfolio Benefit (Cost) $000	Levelized $/MWh
Klamath Peaker 5-Year PPA	10027	OR	Toll	Operating	100	**3.17**	**20,633**	–
[redacted] 10-Year PPA	10027	OR	Toll	Operating	[redacted]	**2.33**	**33,822**	–
[redacted]	10098	OR	Own	Operating	[redacted]	**0.01**	**309**	[redacted]
PSE Fredonia SCCT 7FA.05	Self-Build	WA	Own	New Build	214	**(0.02)**	**(3,914)**	**10,437**
[redacted]	10047	WA	Toll	New Build	[redacted]	**(0.07)**	**(13,902)**	[redacted]
Revised Generic SCCT 7FA.05	Rev Generic	WA	Own	New Build	214	**(0.18)**	**(52,551)**	**14,997**
PSE Fredonia SCCT LMS-100	Self-Build	WA	Own	New Build	200	**(0.23)**	**(71,000)**	**1,215**
[redacted]	10052	OR	Toll	New Build	[redacted]	**(0.41)**	**(145,654)**	[redacted]
[redacted]	10083	WA	Own	New Build	[redacted]	**(0.48)**	**(207,205)**	[redacted]
[redacted]	10119-a	WA	Toll	New Build	[redacted]	**(0.50)**	**(153,651)**	[redacted]
[redacted]	10119-b	WA	Toll	New Build	[redacted]	**(0.51)**	**(165,240)**	[redacted]
[redacted]	10019-b	WA	Toll	New Build	[redacted]	**(0.52)**	**(240,126)**	[redacted]
[redacted]	10019-a	WA	Toll	New Build	[redacted]	**(0.55)**	**(268,991)**	[redacted]

See Exhibit No. ___(AS-3HC) at 55.

3. 2010 RFP Phase I Results for Other PPA Resources

Q. How did other resource proposals evaluate in Phase I?

A. Other operating PPA proposals also evaluated better than new build resources.

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Table 17 below presents the 2010 RFP Phase I quantitative results for other resource proposals.

Table 17. Quantitative 2010 RFP Phase I Results for Other Resource Proposals

Project	Project ID	State	Type	Operating Status	Capacity (MW. Winter)	Benefit Ratio	Portfolio Benefit (Cost) $000	Levelized $/MWh
[redacted]	10102-b	MT	PPA	Operating	[redacted]	**0.12**	**11,048**	[redacted]
[redacted]	10102-a	MT	PPA	Operating	[redacted]	**(0.00)**	**(1,174)**	[redacted]
[redacted]	10063	WA	PPA	New Build	[redacted]	**(0.08)**	**(2,150)**	[redacted]
[redacted]	10151	WA	PPA	Operating	[redacted]	**(0.10)**	**(961)**	[redacted]
[redacted]	Unsolicited	WA	Toll	New Build	[redacted]	**(0.13)**	**(15,051)**	[redacted]

See Exhibit No. ___(AS-3HC) at 55.

4. 2010 RFP Phase I Selected Candidate Short List for Capacity Resources

Q. Which capacity resource proposals evaluated most favorably in Phase I?

A. Of the 21 capacity proposals, operating plants evaluated most favorably when both quantitative and qualitative findings were considered. Additionally, winter seasonal structures offered the greatest cost benefits because PSE would be responsible for operating costs for only a portion of the year.

Proposals from projects that interconnect with PSE's system offered transmission cost savings over those interconnected with other systems. Two operating projects interconnect with PSE's system: (i) the [redacted] (#10020); and

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(ii) the [redacted] (#10151). Three self-build natural gas projects and four new build projects would interconnect with PSE's system.

Q. Which capacity resource proposals did PSE identify for further analysis?

A. PSE selected thirteen capacity resource offers (from eleven proposals) and PSE's three self-build natural gas resource development projects for further evaluation.

Table 18. 2010 RFP Phase 1 Candidate Short List for Capacity Resources

Project Name	Project ID	Fuel	Technology	Developer	County	State	Term	Winter Capacity (MW)	Estimated COD
CCCT – Own									
[redacted]	10048	NatG	CCCT	[redacted]	[redacted]	WA	Own	[redacted]	[redacted]
PSE CCCT 7FA.05	Self-Build	NatG	CCCT	PSE	Pierce	WA	Own	346	1/1/2015
[redacted]	10072-b	NatG	CCCT	[redacted]	[redacted]	WA	Own	[redacted]	[redacted]
CCCT – Toll									
[redacted]	10027	NatG	CCCT	[redacted]	[redacted]	OR	Toll – 5-yr	[redacted]	[redacted]
[redacted]	10027	NatG	CCCT	[redacted]	[redacted]	OR	Toll – 10-yr	[redacted]	[redacted]
[redacted]	10020	NatG	CCCT	[redacted]	[redacted]	WA	Toll – 15-yr	[redacted]	[redacted]
[redacted]	10164	NatG	CCCT	[redacted]	[redacted]	WA	Toll – 10-yr	[redacted]	[redacted]
Peaker – Own									
PSE SCGT 7FA.05	Self-Build	NatG	Peaker	PSE	Skagit	WA	Own	214	1/1/2013
PSE SCGT LSM-100	Self-Build	NatG	Peaker	PSE	Skagit	WA	Own	200	1/1/2013
Peaker – Toll									
Klamath Peaker 5-Yr PPA	10027	NatG	Peaker	Iberdrola Renewables	Klamath	OR	Toll – 5-yr	100	1/1/2012
[redacted] 10-Yr PPA	10027	NatG	Peaker	[redacted]	[redacted]	OR	Toll – 10-yr	[redacted]	[redacted]
[redacted]	10047	NatG	Peaker	[redacted]	[redacted]	WA	Toll – 20-yr	[redacted]	[redacted]

Table 18. 2010 RFP Phase 1 Candidate Short List for Capacity Resources (contd.)

Project Name	Project ID	Fuel	Technology	Developer	County	State	Term	Winter Capacity (MW)	Estimated COD
Hydro – PPA									
[redacted]	10102-b	Hydro	Run of River	[redacted]	[redacted]	MT	Fixed – 10-yr	[redacted]	[redacted]
[redacted]	10151	Hydro	Run of River	[redacted]	[redacted]	WA	Fixed – 20-yr	[redacted]	[redacted]
Biomass and System – PPA									
[redacted]	10102-a	Unspecified	N/A	[redacted]	N/A	MT	Fixed < 5-yr	[redacted]	[redacted]
[redacted]	10063	Biomass	Biomass	[redacted]	[redacted]	WA	Fixed – 20-yr	[redacted]	[redacted]

See Exhibit No. ___(AS-3HC) at 58.

C. 2010 RFP Phase II Evaluation Results for Capacity Resources and Continuing Investigation of Renewable Resources

Q. What analysis did PSE undertake for capacity resources in the Phase II of the 2010 RFP?

A. In the 2010 RFP Phase II process for capacity resources, PSE performed additional quantitative and qualitative review of the "Candidate Short List." PSE sent data requests to bidders of capacity resources to obtain information about project operating and maintenance history, plant performance data, status of environmental permits, updates about emissions performance, transmission service requests, and for the new development projects-information about development progress. These data requests helped PSE refine the quantitative and qualitative analyses. Additionally, PSE included the Continuing Investigation renewable resources for further consideration and a few new

unsolicited proposals and repriced proposals in this evaluation. PSE updated its PSM model analysis and used its Optimization Model to evaluate quantitatively the remaining offers.

Q. Did PSE update the PSM model analysis to reflect new information gathered during due diligence?

A. Yes. Because PSE relies on the screening results to help identify the short list, PSE updated its quantitative PSM results for the most promising resources based on information learned during the further evaluation of these resources. *See* Exhibit No. ___(AS-3HC) at 60-64. Please see Exhibit No. ___(AS-3HC) at 65-71 for the revised screening metrics and optimization results for the most promising resources as well as the qualitative evaluation results.

Q. What were the Optimization Model results for capacity resources conducted by PSE in Phase II of the 2010 RFP?

A. Table 19 below presents the results of the RFP Phase II Optimization Model analysis for both renewable and capacity resources. In addition to the most promising resources identified, PSE included in its evaluation one-year PPAs at an index price to represent the potential to fill its short-term capacity need using resources available in the marketplace and connected to PSE's system that were not bid into the RFP. PSE limited these market resources to the years 2012 through 2014, and assumed that it could purchase such contracts in 25 MW

increments in each year. A "MW" quantity indicates a resource was selected for the optimal scenario.

Table 19. Optimization Model Scenario Analysis Results

Proposed Project	Project ID	Trends 2010	BAU	GW	LG	LG With Base Capital Costs
[redacted]	10102-a	[redacted] MW		[redacted] MW	[redacted] MW	
Klamath Peaker 5-Year PPA	10027				75 MW	
Index Contract – 2012 – Fixed Price PPA	N/A	175 MW	275 MW		250 MW	75 MW
Index Contract – 2013 – Fixed Price PPA	N/A	25 MW	125 MW		275 MW	100 MW
Index Contract – 2014 – Fixed Price PPA	N/A	25 MW	100 MW		300 MW	100 MW
[redacted]	10102-b					[redacted] MW
[redacted]10-Year PPA	10027	[redacted] MW	[redacted] MW			[redacted] MW
PSE Build Peaker – Ownership	Self-Build	214 MW	214 MW			
[redacted]	10020	[redacted] MW	[redacted] MW			[redacted] MW
[redacted]	10048			[redacted] MW		
[redacted]	10063			[redacted] MW		
[redacted]	Unsolicited		[redacted] MW	[redacted] MW		
[redacted]	10009			[redacted] MW		
[redacted]	10025			[redacted] MW		
[redacted]	Unsolicited			[redacted] MW		
[redacted]	Unsolicited	[redacted] MW		[redacted] MW		
[redacted]	10075-a			[redacted] MW		
[redacted] REC	10059	[redacted] MW	[redacted] MW		[redacted] MW	[redacted] MW

Portfolio Revenue Requirement ($MM)	$13,832	$11,659	$17,881	$9,494	$10,102

Generic Peaker Builds Through 2017	207 MW (2015); 414 MW (2017)	207 MW (2015); 414 MW (2017)	207 MW (2017)	414 MW (2015); 621 MW (2017)	207 MW (2015); 414 MW (2017)
Generic Wind Builds Through 2017	None	None	100 MW (2014)	100 MW (2016); 200 MW (2017)	None
Cost-Effective REC Additions	422,726	250,417	1,747,225	61,225	61,225

See Exhibit No. ___(AS-3HC) at 63.

Q. What did the Optimization Model results show?

A. The Optimization Model results for the capacity and remaining renewable resources showed that index PPAs and the 2015 generic peaker were selected in four of the five scenarios. [redacted] (#10102-a), the [redacted] (#10027-d), and the [redacted] (#10020) were selected in three scenarios. For meeting the remaining 2020 renewable need, [redacted] (#10059-b) REC proposal was selected in four scenarios, and [redacted] (unsolicited) and [redacted] (unsolicited) were selected in two scenarios.

Q. What are the combined evaluation results for capacity resources?

A. Quantitatively, the Natural Gas-Fired CCCT resources are not competitive with the Klamath 5-Year Peaker (#10027) or the [redacted] (#10102-a). PSE's self-build frame peaker offers a significant cost savings over many existing resources offered in the 2010 RFP because it will interconnect to PSE's system saving BPA transmission wheeling costs. On the other hand, [redacted] proposed a [redacted]-year tolling PPA for [redacted] MW sourced from its [redacted] (#10020) in [redacted], Washington. PSE did not select this proposal at this time because the economics of the offer were less favorable than other alternatives. Other areas of potential risk include

availability and contract terms, as well as a gas contract that expires prior to the end of the proposed PPA term. Other projects such as the sale of [redacted] (#10048), an existing [redacted] MW facility located in [redacted], Washington, were challenged because they have not secured firm transmission rights which may not be available until BPA completes its I-5 Corridor Reinforcement Project in 2016. See Exhibit No. ___(AS-3HC) at 115-150 for a summary of the combined findings for the resources not described above.

Q. What are the combined evaluation results for the biomass resources?

A. Although biomass projects provide both capacity and renewable benefits, the PSM results need to be tempered because they represent a quantitative conclusion that it is beneficial to add renewable resources early. The results give the projects benefits for displacing wind built in 2012 as well as a peaking resource. The economics would look different if the project is displacing renewable resources in 2020. The Optimization Model does a better job at assessing the value of the biomass projects, but it is hard to discern the relative rankings. PSE just knows whether the resource is selected or not. These projects' costs are also at risk with EPA considering regulating the emissions of biomass plants with its greenhouse gas Tailoring Rule and proposed changes to the Boiler Maximum Achievable Control Technology ("MACT") Rule. *See* Exhibit No. ___(AS-3HC) at 115-150 for a summary of the combined findings for the resources not described above.

Q. What are the combined evaluation results for wind and unbundled REC proposals?

A. As a further check, PSE extended the Section 1603 Treasury Grant in its modeling assumptions to reduce the likelihood that the Optimization Model would add renewable resources early to capture the benefits of expiring federal incentives. The Optimization Model still selected the [redacted] (#10059-b) REC proposal in most scenarios and the [redacted] (unsolicited) in two scenarios. Although long-term there may be benefits to adding the unbundled REC proposal, from now until 2020, the [redacted] (#10059-b) REC proposal adds cost without adding capacity or energy value. Its only benefit to the portfolio would be an arbitrage opportunity before 2020. See Exhibit No. ___(AS-3HC) at 115-150 for a summary of the combined findings for the resources not described above.

D. PSE Selected the Klamath Peaker 5-Year PPA (#10027) and the [redacted] (#10102-a) for the Short List

Q. What capacity resources did the 2010 RFP evaluation team select for the short list for negotiation and potential acquisition?

A. The 2010 RFP evaluation team selected two PPA proposals for negotiation and potential acquisition: the Klamath Peaker 5-Year PPA (#10027) and the [redacted] (#10102-a).

Q. Please describe the rationale for selecting the Klamath Peaker 5-Year PPA (#10027).

A. PSE selected the Klamath Peaker Five-Year PPA (#10027-c) because a winter seasonal PPA offered significantly more favorable economics than any other alternative offered in the RFP. The firm transmission capacity matches closely with the capacity of the offer. PSE felt transmission arrangements were available that would be satisfactory to count the Klamath Peaker 5-Year PPA (#10027) as a capacity product.

Q. Please describe the rationale for selecting the [redacted] (#10102-a).

A. PSE selected the [redacted] (#10102-a), which offers [redacted] MW of firm power to PSE's system at a fixed price limiting PSE's exposure to fluctuations in the market. This alternative ranks second among the RFP alternatives and had the lowest levelized cost of any resource evaluated. [redacted] MW of the transmission will need to be redirected to PSE's system, but it is expected that this is possible. Overall, this proposal has fewer associated risks and provides the most favorable economics of the RFP alternatives. [redacted] has indicated that they will accept any carbon risk for the term of the contract and the price includes firm transmission to PSE's system for the entire contract capacity. A total of up to [redacted] MW can be selected from the two [redacted] proposal alternatives.

Q. Please summarize the results of the 2010 RFP.

A. Acquisition of short-listed resources will help reduce near-term capacity need through early 2016, while leaving room to investigate other potentially favorable opportunities. With the addition of LSR Phase 1 and the two short-listed RFP resources, PSE is forecasting a capacity need of approximately 446 MW in 2012 that grows to more than 1,000 MW by 2017. As such, current decisions must take longer-term resource needs into consideration to achieve the most cost-effective solutions. After a thorough review of the 2010 RFP proposals, PSE believes that the most cost-effective strategy to fill the Company's capacity need may include market opportunities from existing resources in the region that were not bid into the RFP process, or potential self-build opportunities. PSE will maintain an open dialogue with the respondents from the 2010 RFP with existing resource alternatives as it explores market opportunities.

Q. What renewable resources did PSE team select for the shortlist for negotiation and potential acquisition?

A. PSE did not select any renewable resource proposals submitted in response to the 2010 RFP for the shortlist.

Q. Please describe the rationale for not selecting any renewable resource proposals submitted in response to the 2010 RFP for the shortlist.

A. As discussed above, PSE determined that LSR Phase 1 was the lowest reasonable cost and lowest reasonable risk renewable resource that meets the needs of PSE and its customers. With LSR Phase 1, PSE has fulfilled its obligations under the Washington state RPS for both 2012 and 2016. The decision to construct LSR Phase 1 brings PSE one step closer to meeting its renewable energy requirements under the Washington state RPS. Once LSR Phase 1 is online in 2012, PSE will have enough renewable resources in its portfolio to meet its state-mandated renewable energy obligations for 2012 and 2016. Based on changes in the renewable market since completing the 2010 RFP evaluation, PSE still is cautiously reviewing renewable proposals.

E. Re-Evaluation of the Resources Selected for the Short List

Q. Did PSE update its analyses of the Klamath Peaker 5-Year PPA (#10027) and the [redacted] (#10102-a)?

A. Yes. PSE updated its quantitative analysis of the Klamath Peaker 5-Year PPA (#10027) and the [redacted] (#10102-a) in the screening model to reexamine how the projects would rank relative to the other RFP bids as well as new offers received after the conclusion of the 2010 RFP. PSE also reconsidered the qualitative attributes of the Klamath Peaker 5-Year PPA (#10027) and the [redacted] (#10102-a).

Q. Please describe the quantitative updates?

. In September 2010, PSE updated its screening model generic resource costs to be consistent with PSE's latest forecast of generic costs. The PSE resource acquisition team also updated the Screening Model to be based on the draft 2011 IRP base case power and natural gas prices with no CO_2 costs. This update allowed the team to revisit the relative rankings of resources from the 2010 RFP.

Q. Was the negotiated Klamath Peaker 5-Year PPA (#10027) still a competitive resource?

A After completing the 2010 RFP evaluation, Iberdrola Renewables identified an additional 25 MW of BPA network transmission to increase the PPA capacity from 75 MW to 100 MW, and the term was modified to start in January 2012, instead of November 2011, to match up to PSE's winter capacity need. During the RFP, it was not clear whether Iberdrola Renewables was offering a unit contingent product or if they planned to source energy from their wind generation facilities. The negotiated product is a unit contingent product sourced from firm natural gas resources.

The reevaluation of the Klamath Peaker 5-Year PPA (#10027) demonstrated that it was the lowest cost capacity resource available to meet PSE's capacity need compared to the most recent offers. The Klamath Peaker 5-Year PPA (#10027) has the highest benefit ratio of all projects, even if PSE has to procure BPA transmission from the Klamath Busbar to John Day instead of Portland General

Electric Company. Please see Exhibit No. ___(RG-27C) for the updated evaluation results as presented to the EMC on February 17, 2011.

V. CONCLUSION

Q. Please summarize your conclusions.

A. PSE's 2009 IRP showed that PSE had a need for renewable resources to meet a 2016 need and that it was cost effective to pursue these resources to capture the benefits of the federal and state incentives. PSE's analyses described above and in the Prefiled Direct Testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), demonstrated that LSR Phase 1 was the lowest reasonable cost, lowest reasonable risk renewable resource to meet the need identified in the 2009 IRP.

The 2009 IRP addendum showed a capacity need of approximately 934 MW in 2012. For the 2010 RFP capacity evaluation, PSE found that existing resources are more cost competitive than new development resources. Additionally, market opportunities not bid into the 2010 RFP may still be available to meet the capacity need at more competitive pricing. PSE identified the Klamath Peaker 5-Year PPA (#10027) as the lowest reasonable cost, lowest reasonable risk capacity resource to meet the need identified in the 2009 IRP and the 2009 IRP Addendum.

Q. Does that conclude your prefiled direct testimony?

A. Yes, it does.