Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204
PortlandGeneral.com

January 03, 2014

Via Email / US Mail

Kathy Williams
Public Utility Commission of Oregon
Filing Center
PO Box 1088
Salem, OR 97308-1088

RE: **PGE 2013 Renewable Portfolio Standard Implementation Plan**

Kathy:

Per your request, enclosed please find the re-filing and one copy of PGE's Renewable Portfolio Standard Implementation Plan. The Plan is pursuant to OAR 860-083-0400 and provides information about how PGE will meet its RPS requirement in the years 2015 through 2019.

OAR 860-083-0100 specifically describes how to calculate the incremental cost of renewable resources. Those cumulative incremental costs are then compared to the 4% cap as allowed in ORS 469A.100.

The confidential Work Papers containing the underlying models used to prepare the analyses presented in the 2011 Renewable Portfolio Implementation Plan will be provided upon issuance of the Protective Order.

Electronic notification of this duplicate filing is being provided to the UM 1568 Service List.

If you have any questions or require further information, please call Rebecca Brown at (503) 464-8545. Please direct all formal correspondence and requests to the following email address: pge.opuc.filings@pgn.com.

Sincerely,

for Jay Tinker

Jay Tinker
Director, Regulatory Policy and Affairs

JT/sp
cc: UM 1658 Service List
Encl.

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PGE 2013 RPS Implementation Plan

Attachment A

Portland General Electric
Renewable Portfolio Standard
Oregon Implementation Plan[1]
<2015-2019>

As an introduction and summary of the Implementation Plan, answer the following questions:

Why is PGE submitting an Implementation Plan (the Plan)?

The renewable portfolio standard (RPS), ORS 469A.052, states that at least five percent of the electricity sold by a large utility to retail electricity consumers must come from qualifying resources in each of the calendar years 2011, 2012, 2013, and 2014. In 2015 through 2019 the percentage that must come from qualifying resources increases to 15 percent.

ORS 469A.075 requires electric companies subject to ORS 469A.052 to develop an implementation plan for meeting the requirements of the standard and file the plan with the Public Utility Commission. Pursuant to OAR 860-083-0400, this third implementation plan is due January 1, 2014.

What information was used as the basis of this Implementation Plan?

This Implementation Plan is based primarily on existing and under development qualifying renewable resources, and on PGE's Draft 2013 Integrated Resource Plan (IRP).

How does the company intend to meet the RPS target?

PGE intends to meet its RPS target with a combination bundled RECs from existing resources and the addition of new renewable resources. This Plan includes how PGE will comply with ORS 469.100 for the Years 2015 through 2019. Details of PGE's Implementation Plan are given in the following sections.

Provide responses below following the citation of each element of OAR 860-083-0400.

Implementation Plan

OAR 860-083-0400(2)(a)
The annual megawatt-hour target for compliance with the applicable renewable portfolio standard based on the forecast of electricity sales to its Oregon retail electricity customers.

[1] Throughout this document the term 'issued' refers to generated RECs and the term 'acquired' refers to purchased RECs (unbundled or bundled).

Response:
2015 – 2,864,520 MWh
2016 – 2,907,504 MWh
2017 – 2,943,360 MWh
2018 – 2,978,400 MWh
2019 – 3,022,200 MWh

See Attachment A, which is an Excel spreadsheet, Tab 3 – "Annual Compliance by Resource"

OAR 860-083-0400(2)(b)
An accounting of the planned method to comply with the applicable renewable portfolio standard, including number of banked RECs by year of issuance, the number of other bundled and unbundled renewable energy certificates, and alternative compliance payments.

Response:
See Attachment A, which is an Excel spreadsheet, Tab 3 – "Annual Compliance by Resource" for detail by year.

	Banked	Bundled	Unbundled	ACP
2015	2,864,520	2,864,520	0	0
2016	2,907,504	2,907,504	0	0
2017	2,943,360	2,943,360	0	0
2018	2,978,400	2,978,400	0	0
2019	3,022,200	3,022,200	0	0

OAR 860-083-0400(2)(c)
Identification of generating facilities, either owned by the company or under contract, that are expected to provide renewable energy certificates for compliance with renewable portfolio standard. Information on each generating facility must include: (A) the renewable energy source; (B) the year the facility or contract became operational or is expected to become operational; (C) the state where the facility is located or is planned to be located; and (D) expected annual megawatt-hour output for compliance from the facility for the compliance year covered by the implementation plan.

Response:

Name: Vansycle Ridge Wind Farm
Source: Wind – PPA
Year: 1997
State: Oregon
Expected MWh output: 8 MWa = 70,080 MWh

Name: North Fork (upgrade)
Source: Hydroelectric

Year: 2001
State: Oregon
Expected MWh output: 0.52 MWa = 7,780 MWh

Name: Faraday (upgrade)
Source: Hydroelectric
Year: various
State: Oregon
Expected MWh output: 0.52 MWa = 4,530 MWh

Name: Sullivan (upgrade)
Source: Hydroelectric
Year: various
State: Oregon
Expected MWh output: 0.89 MWa = 7,780 MWh

Name: River Mill (upgrade)
Source: Hydroelectric
Year: 1996-1997
State: Oregon
Expected MWh output: 0.06 MWa = 533 MWh

Name: Round Butte (upgrade)
Source: Hydroelectric
Year: 2002-2003
State: Oregon
Expected MWh output: 10.20 MWa = 89,327 MWh

Name: Klondike II Wind Farm
Source: Wind - PPA
Year: 2005
State: Oregon
Expected MWh output: 26 MWa = 231,516 MWh

Name: Pelton Round Butte
Source: Hydroelectric (certified low impact)
Year: 2007
State: Oregon
Expected Annual Qualifying MWh output: 50 MWa = 438,000 MWh

Name: Biglow Canyon Wind Farm (Phases 1, 2, and 3)
Source: Wind
Year: Phase 1 – 2008; Phase 2 – 2010; Phase 3 – 2011 (first full year of operation for each phase)
State: Oregon
Expected MWh output: (125+150+175 MW); 1.25 million MWh output (1.25 GWh)

Name: SunWay 1 & 2
Source: Solar

Year: 2008 & 2009
State: Oregon
Expected MWh output: 0.13 MWa[2] = 1,168 MWh (876 MWh)

Name: SunWay 3
Source: Solar
Year: 2010
State: Oregon
Expected MWh output: 0.33 MWa = 2,896 MWh (2,519 MWh)

Name: Bellevue Solar
Source: Solar
Year: 2011
State: Oregon
Expected MWh output: 0.21 MWa = 1,866 MWh

Name: Yamhill Solar
Source: Solar
Year: 2011
State: Oregon
Expected MWh output: 0.15 MWa = 1,273 MWh

Name: Tucannon River Wind Farm
Source: Wind
Year: 2015
State: Oregon
Expected MWh output: 102.45 MWa = 897,473 MWh

Name: Solar Payment Option Program (SPO)
Source: Solar
Year: 2010 – 2015
State: Oregon
Expected MWh Output: 2.07 MWa = 18,091 MWh

OAR 860-083-0400(2)(d)
A forecast of the expected incremental costs of new qualifying electricity for facilities or contracts planned for first operation in the compliance year, consistent with the methodology in OAR 860-083-0100.

Response:

2015:

[2] Sunway projects are shown at full capacity. Currently a share of these projects is allocated to PGE's Clean Wind Fund at 25% and 13% for Sunway 1 & 2, and 3 respectively. Values in parenthesis represent RECs available for RPS compliance.

102.45 MWa forecast to be on-line in 2015. See Attachment A, Tab 2– "Incr. Cost of RECs Generated" for estimated incremental cost.

Tucannon:	523,526	x	$10.78	=	$5,643,851 ($9,675,172 annualized)

2016:
N/A; PGE's most recently acknowledged IRP Action Plan only includes new RPS resource additions up to 2015. Any further RPS resource additions will be addressed in PGE's future IRP Action Plans.

2017:
N/A; PGE's most recently acknowledged IRP Action Plan only includes new RPS resource additions up to 2015. Any further RPS resource additions will be addressed in PGE's future IRP Action Plans.

2018:
N/A; PGE's most recently acknowledged IRP Action Plan only includes new RPS resource additions up to 2015. Any further RPS resource additions will be addressed in PGE's future IRP Action Plans.

2018:
N/A; PGE's most recently acknowledged IRP Action Plan only includes new RPS resource additions up to 2015. Any further RPS resource additions will be addressed in PGE's future IRP Action Plans.

OAR 860-083-0400(2)(e)
A forecast of the expected incremental costs of compliance, the costs of using unbundled renewable energy certificates and alternative compliance payments for compliance, compared to annual revenue requirements, consistent with the methodologies in OAR 860-083-0100 and 860-083-0200, absent consideration of the cost limit in OAR 860-083-0100.

Response:
PGE does not plan to use Alternative Compliance Payments (ACP) in any of the compliance years, 2015 through 2019. For a forecast of the expected incremental costs of compliance and the costs of using unbundled renewable energy certificates for compliance compared to annual revenue requirements, see Attachment A, Tab 1 –"Incremental Cost Summary."

OAR 860-083-0400(2)(f)
A forecast of the number and cost of bundled renewable energy certificates issued, consistent with the methodology in OAR 860-083-0100.

Response:

See Attachment A, Tab 5 – "RECs Generated" for a forecast of the number of bundled renewable energy certificates issued. The forecast number of bundled RECs is based on expected generation from qualifying renewable resources.

The BPA Environmental Redispatch (ER) (a.k.a., Oversupply Management Protocol) business practice reduced generation and REC production in 2011 and 2012 for PGE's RPS qualifying wind resources located in BPA's Balancing Authority Area. PGE did not forecast a reduction in generation and RECs due to BPA ER for 2015 and beyond. However, if the BPA ER business practice continues, it will likely reduce future generation and REC production from qualifying wind resources.

The BPA Dispatch Standing Order 216 (DSO 216) reduced generation and REC production in 2011, 2012, and 2013 for PGE's qualifying wind resources located in BPA's Balancing Authority Area. PGE did not forecast a reduction in generation and RECs due to DSO 216 for 2012 and beyond. However, if DSO 216 continues, it will likely reduce future generation and REC production from qualifying wind resources.

See Attachment A, Tab 2 – "Incr. Cost of RECs Generated" for a forecast of the cost of bundled renewable energy certificates issued. Bundled RECs are the RECs from each resource with incremental costs.

OAR 860-083-0400(4)
If there are material differences in the planned actions in [OAR 860-083-0400(2)] of this rule from the action plan in the most recently filed or updated integrated resource plan by the electric company, or if conditions have materially changed from the conditions assumed in such filing, the company must provide sufficient documentation to demonstrate how the implementation plan appropriately balances risks and expected costs as required by the integrated resource planning guidelines in 1.b and c. of Commission Order No. 07-047 and subsequent guidelines related to implementation plans set forth by the Commission. Unless provided in the most recently filed or updated integrated resource plan, an implementation plan for an electric company subject to ORS 469A.052 must include the following information: (a) At least two forecasts for subsections (2)(d), (e), and (f) of this rule: one forecast assuming existing government incentives continue beyond their current expiration date and another forecast assuming existing government incentives do not continue beyond their current expiration date; (b) A reasonable range of estimates for the forecasts in subsections (2)(d), (e), and (f) of this rule, consistent with subsection (4)(a) of this rule and the analyses or methodologies in the company's most recently filed or updated integrated resource plan.

Response:

In response to OAR 860-083-0400 (4):

There are no material differences between the Implementation Plan and PGE's Draft 2013 IRP (Draft Plan) and conditions have not materially changed. Given the timing of filing our Draft IRP, we did not believe it was appropriate to use data/forecast from PGE's "most recently filed or updated integrated resource plan."

In response to requirements OAR 860-083-0400 (4)(a) and (4)(b):

See Attachment A, Tab 4 – "Incremental Cost by Resource." The Biglow Canyon and Tucannon resources are assumed to receive government incentives currently in place.

OAR 860-083-0400(5)
Under the following circumstances , the electric company must, for the applicable compliance year, provide sufficient documentation or citations to demonstrate how the implementation plan appropriately balances risks and expected costs as required by the integrated resources planning guidelines in 1.b and c. of Commission Order No. 07-047 and subsequent guideline related to implementation plans set forth by the Commission. (a) The sum of costs in subsection (2) (e) of this rule is expected to be four percent or more of the annual revenue required in subsection (2)(e) of this rule for any compliance year covered by the implementation plan, (b) The company plans, for reasons other than to meet unanticipated contingencies that arise during a compliance year to use any of the following compliance methods: (A) Unbundled renewable energy certification; (B) Bundled renewable energy certificates issued between January 1 through March 31 of the year following the compliance year: or (C) Alternative compliance payment, or (c) The company plans to sell any bundled renewable energy certificates included in the rates of Oregon retail electricity consumers.

Response:

(a):

The costs in PGE's response to OAR 860-083-0400 (2)(e) are provided in Attachment A, Tab 1 – "Incremental Cost Summary." The forecasted incremental cost of compliance will not exceed four percent of the annual revenue requirement in the reference gas/reference CO_2 scenario and in seven other scenarios. Incremental cost is forecasted to exceed four percent of the annual revenue requirement in four of the twelve scenarios[3]. There are a variety of reasons why the forecast shows PGE exceeding the four percent cap in some of the scenarios. We have identified a few that could be factors: 1) the continued expected low gas cost, 2) the revenue requirement does not take into consideration expected asset additions of Port Westward 2, Tucannon and Carty, and, 3) the updated capacity factor for Biglow. Once PW2, Tucannon, and Carty are included in the forecasted revenue requirement, the incremental cost, as a percentage of the revenue requirement will decrease. The gas price forecast will be updated as required in future Implementation Plans.

(b):

PGE does not plan to use unbundled RECs to meet RPS compliance targets within future compliance years 2015 through 2019; however, PGE reserves the right to do so if the availability and market prices for unbundled RECs warrants it in the future.

[3] Cases that exceed the four percent are 2-LowGas-No CO_2, 3-RefGas-No CO_2, 5-LowGas-Low CO_2, and 8-LowGas-Ref CO_2 (reference to Tabs in Attachment A spreadsheet).

Pursuant to OAR 860-083-0300 (3)(b)(B), an electric utility company must use, in chronological order (from first issued to last issued) its banked RECs before using 1) RECs generated in the compliance year, and 2) RECs generated between January 1 through March 31 of the year following the compliance year.

(c):

PGE intends to continue monitoring REC markets and may purchase or sell bundled or unbundled RECs in the market when price is perceived to be a good value in relation to other means of achieving RPS compliance.

OAR 860-083-0400(6)
An implementation plan must provide a detailed explanation of how the implementation plan complies, or does not comply, with any conditions specified in a Commission acknowledgement order on the previous implementation plan and any relevant condition specified in the most recent acknowledgement order on an integrated resource plan filed or updated by the electric company.

Response:

Order 10-173 acknowledged PGE's first Implementation Plan filing, filed December 31, 2009. The order contained no conditions; however, the order recommends development of a standardized template for the 2011 filing. That form was developed jointly by OPUC Staff and the parties earlier in 2011 and is the format PGE is using for this Implementation Plan filing.

Order No. 12-271, dated July 2, 2012, acknowledged PGE's second Implementation Plan, filed December 28, 2011. OPUC required PGE to not include shaping costs in its next Implementation Plan, which we have complied with.

Order 10-457 acknowledged PGE's 2009 Integrated Resource Plan and 2010 Addendum, with conditions. No conditions pertain directly to implementation plan filing requirements. PGE filed its Draft 2013 Integrated Resource Plan on November 22, 2013.

OAR 860-083-0400(7)
If there are funds in holding accounts under ORS 469A.180(4) and if there electric company has not filed a proposal for expending such finds for the purpose allowed under ORS 469A. 180(5), the implementation plan must include the electric company's plans for expending or holding such funds. If the plan is to hold such funds, the plan should indicate under what conditions such funds should be expended.

Response:

Funds described in this rule pertain to ACP. As of December 2012, PGE has made no ACP and thus has no applicable ACP funds for disposition. The rule is not applicable to PGE at this time.

PGE 2013 RPS Implementation Plan

Attachment A

Confidential and subject to OAR 860-011-0070

Provided in electronic format (CD) only

Tab 1 - Incremental Cost Summary

	Total Incremental Cost to Comply				
Base Case (RefGas-RefCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	23,013,723	17,600,697	15,853,045	13,583,379	11,129,440
Biglow Canyon II	27,445,869	26,963,693	28,896,812	24,759,680	20,286,659
Biglow Canyon III	9,211,538	23,286,334	24,015,759	20,577,444	16,859,975
Tucannon River	-	-	-	4,097,533	8,719,173
Total Incremental Cost	**59,671,130**	**67,850,725**	**68,765,617**	**63,018,036**	**56,995,246**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**3.5%**	**3.9%**	**3.9%**	**3.5%**	**3.1%**

Case 2 (LowGas-NoCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	29,441,268	22,516,429	20,280,672	17,377,106	14,237,802
Biglow Canyon II	33,940,785	33,344,504	35,735,085	30,618,924	25,087,386
Biglow Canyon III	13,676,833	34,574,390	35,657,403	30,552,364	25,032,851
Tucannon River	-	-	-	14,527,716	30,913,640
Total Incremental Cost	**77,058,885**	**90,435,322**	**91,673,160**	**93,076,108**	**95,271,679**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**4.5%**	**5.2%**	**5.2%**	**5.2%**	**5.2%**

Case 3 (RefGas-NoCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	25,067,846	19,171,673	17,268,032	14,795,783	12,122,814
Biglow Canyon II	29,573,575	29,054,019	31,137,000	26,679,143	21,859,356
Biglow Canyon III	11,749,715	29,702,727	30,633,140	26,247,420	21,505,627
Tucannon River	-	-	-	10,341,850	22,006,504
Total Incremental Cost	**66,391,137**	**77,928,419**	**79,038,172**	**78,064,195**	**77,494,302**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**3.9%**	**4.5%**	**4.5%**	**4.4%**	**4.3%**

Case 4 (HighGas-NoCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	21,954,505	16,790,617	15,123,401	12,958,197	10,617,202
Biglow Canyon II	26,401,498	25,937,670	27,797,230	23,817,524	19,514,710
Biglow Canyon III	10,330,854	26,115,912	26,933,971	23,077,858	18,908,670
Tucannon River	-	-	-	7,043,536	14,987,995
Total Incremental Cost	**58,686,857**	**68,844,198**	**69,854,602**	**66,897,114**	**64,028,578**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**3.4%**	**4.0%**	**3.9%**	**3.7%**	**3.5%**

Case 5 (LowGas-LowCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	27,743,407	21,217,919	19,111,097	16,374,978	13,416,716
Biglow Canyon II	32,209,236	31,643,375	33,911,997	29,056,845	23,807,509
Biglow Canyon III	11,680,710	29,528,284	30,453,233	26,093,270	21,379,325
Tucannon River	-	-	-	9,907,409	21,082,053
Total Incremental Cost	**71,633,352**	**82,389,579**	**83,476,327**	**81,432,502**	**79,685,604**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**4.2%**	**4.7%**	**4.7%**	**4.6%**	**4.4%**

Case 6 (RefGas-LowCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	23,301,751	17,820,979	16,051,454	13,753,381	11,268,730
Biglow Canyon II	27,786,422	27,298,263	29,255,368	25,066,902	20,538,379
Biglow Canyon III	9,733,024	24,604,627	25,375,346	21,742,380	17,814,456
Tucannon River	-	-	-	5,719,518	12,170,606
Total Incremental Cost	**60,821,197**	**69,723,868**	**70,682,169**	**66,282,181**	**61,792,172**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**3.5%**	**4.0%**	**4.0%**	**3.7%**	**3.4%**

Case 7 (HighGas-LowCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	20,108,584	15,378,872	13,851,835	11,868,680	9,724,514
Biglow Canyon II	24,549,295	24,118,006	25,847,108	22,146,600	18,145,651
Biglow Canyon III	8,290,101	20,956,985	21,613,445	18,519,067	15,173,459
Tucannon River	-	-	-	2,418,834	5,147,055
Total Incremental Cost	**52,947,980**	**60,453,864**	**61,312,389**	**54,953,181**	**48,190,680**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**3.1%**	**3.5%**	**3.5%**	**3.1%**	**2.7%**

Case 8 (LowGas-RefCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS	-				
Biglow Canyon I	26,945,815	20,607,928	18,561,675	15,904,216	13,031,000
Biglow Canyon II	31,453,439	30,900,856	33,116,244	28,375,020	23,248,860
Biglow Canyon III	11,005,627	27,821,706	28,693,198	24,585,217	20,143,714
Tucannon River	-	-	-	8,270,297	17,598,429
Total Incremental Cost	**69,404,881**	**79,330,491**	**80,371,117**	**77,134,750**	**74,022,004**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**4.0%**	**4.6%**	**4.5%**	**4.3%**	**4.1%**

Case 9 (HighGas-RefCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	19,840,186	15,173,604	13,666,949	11,710,264	9,594,717
Biglow Canyon II	24,224,740	23,799,153	25,505,395	21,853,810	17,905,756
Biglow Canyon III	7,774,532	19,653,652	20,269,286	17,367,350	14,229,808
Tucannon River	-	-	-	797,432	1,696,861
Total Incremental Cost	**51,839,458**	**58,626,409**	**59,441,630**	**51,728,855**	**43,427,143**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**3.0%**	**3.4%**	**3.4%**	**2.9%**	**2.4%**

Case 10 (LowGas-HighCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	22,324,450	17,073,548	15,378,239	13,176,550	10,796,107
Biglow Canyon II	26,982,904	26,508,862	28,409,372	24,342,027	19,944,458
Biglow Canyon III	4,631,273	11,707,641	12,074,373	10,345,695	8,476,668
Tucannon River	-	-	-	(6,676,126)	(14,206,181)
Total Incremental Cost	**53,938,628**	**55,290,050**	**55,861,984**	**41,188,146**	**25,011,052**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**3.1%**	**3.2%**	**3.2%**	**2.3%**	**1.4%**

Case 11 (RefGas-HighCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	18,069,995	13,819,777	12,447,550	10,665,445	8,738,652
Biglow Canyon II	22,712,641	22,313,620	23,913,359	20,489,704	16,788,086
Biglow Canyon III	2,740,016	6,926,631	7,143,601	6,120,858	5,015,079
Tucannon River	-	-	-	(10,858,460)	(23,105,802)
Total Incremental Cost	**43,522,652**	**43,060,027**	**43,504,510**	**26,417,547**	**7,436,016**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**2.5%**	**2.5%**	**2.5%**	**1.5%**	**0.4%**

Case 12 (HighGas-HighCO2)	**2015**	**2016**	**2017**	**2018**	**2019**
Unbundled RECS					
Biglow Canyon I	14,683,448	11,229,775	10,114,720	8,666,605	7,100,918
Biglow Canyon II	19,317,928	18,978,546	20,339,182	17,427,239	14,278,878
Biglow Canyon III	1,238,802	3,131,634	3,229,730	2,767,332	2,267,393
Tucannon River	-	-	-	(14,164,885)	(30,141,570)
Total Incremental Cost	**35,240,179**	**33,339,955**	**33,683,633**	**14,696,291**	**(6,494,381)**
Revenue Requirement ($000)	1,720,285	1,740,713	1,770,444	1,788,165	1,817,325
Percentage of Rev Requirement	**2.0%**	**1.9%**	**1.9%**	**0.8%**	**-0.4%**

Notes:

Although the SunWay, Bellevue and Yamhill solar projects produce RECs that PGE uses for compliance, until the sum of these projects is 20 MW, they are not included in the incremental cost calcualtion (pursuant to OAR 860-083-0100(13)(a)

In addition, the following RPS resources are deemed to be zero incremental cost because they are either low-impact hydro or had an in-service date prior to June 6, 2007 (pursuant to OAR 860-083-0100(1)(i):

- North Fork Upgrade
- Faraday Upgrade
- Round Butte Upgrade
- Pelton-Round Butte Low-Impact Hydro
- PPM Klondike II
- Vansycle Ridge

Tab 2 - Incremental Cost for RECs Generated

Base Case (RefGas-RefCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	10,961,187	10,991,217	10,961,187	10,961,187	10,961,187
Biglow Canyon II	19,979,968	20,034,708	19,979,968	19,979,968	19,979,968
Biglow Canyon III	16,605,088	16,650,582	16,605,088	16,605,088	16,605,088
Tucannon River	5,643,851	9,701,680	9,675,172	9,675,172	9,675,172
Total Incremental Cost	**53,190,094**	**57,378,187**	**57,221,416**	**57,221,416**	**57,221,416**

Case 2 (LowGas-NoCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	14,022,557	14,060,975	14,022,557	14,022,557	14,022,557
Biglow Canyon II	24,708,119	24,775,812	24,708,119	24,708,119	24,708,119
Biglow Canyon III	24,654,408	24,721,954	24,654,408	24,654,408	24,654,408
Tucannon River	20,010,151	34,397,097	34,303,116	34,303,116	34,303,116
Total Incremental Cost	**83,395,235**	**97,955,838**	**97,688,200**	**97,688,200**	**97,688,200**

Case 3 (RefGas-NoCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	11,939,543	11,972,254	11,939,543	11,939,543	11,939,543
Biglow Canyon II	21,528,890	21,587,873	21,528,890	21,528,890	21,528,890
Biglow Canyon III	21,180,508	21,238,537	21,180,508	21,180,508	21,180,508
Tucannon River	14,244,633	24,486,274	24,419,371	24,419,371	24,419,371
Total Incremental Cost	**68,893,575**	**79,284,938**	**79,068,313**	**79,068,313**	**79,068,313**

Case 4 (HighGas-NoCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	10,456,692	10,485,341	10,456,692	10,456,692	10,456,692
Biglow Canyon II	19,219,690	19,272,347	19,219,690	19,219,690	19,219,690
Biglow Canyon III	18,622,812	18,673,833	18,622,812	18,622,812	18,622,812
Tucannon River	9,701,609	16,676,895	16,631,330	16,631,330	16,631,330
Total Incremental Cost	**58,000,803**	**65,108,416**	**64,930,524**	**64,930,524**	**64,930,524**

Case 5 (LowGas-LowCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	13,213,884	13,250,086	13,213,884	13,213,884	13,213,884
Biglow Canyon II	23,447,591	23,511,831	23,447,591	23,447,591	23,447,591
Biglow Canyon III	21,056,116	21,113,804	21,056,116	21,056,116	21,056,116
Tucannon River	13,646,244	23,457,652	23,393,561	23,393,561	23,393,561
Total Incremental Cost	**71,363,834**	**81,333,374**	**81,111,151**	**81,111,151**	**81,111,151**

Case 6 (RefGas-LowCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	11,098,371	11,128,778	11,098,371	11,098,371	11,098,371
Biglow Canyon II	20,227,883	20,283,302	20,227,883	20,227,883	20,227,883
Biglow Canyon III	17,545,140	17,593,209	17,545,140	17,545,140	17,545,140
Tucannon River	7,877,936	13,542,033	13,505,033	13,505,033	13,505,033
Total Incremental Cost	**56,749,330**	**62,547,321**	**62,376,427**	**62,376,427**	**62,376,427**

Case 7 (HighGas-LowCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	9,577,500	9,603,740	9,577,500	9,577,500	9,577,500
Biglow Canyon II	17,871,328	17,920,291	17,871,328	17,871,328	17,871,328
Biglow Canyon III	14,944,069	14,985,012	14,944,069	14,944,069	14,944,069
Tucannon River	3,331,647	5,727,043	5,711,395	5,711,395	5,711,395
Total Incremental Cost	**45,724,545**	**48,236,086**	**48,104,293**	**48,104,293**	**48,104,293**

Case 8 (LowGas-RefCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	12,834,000	12,869,161	12,834,000	12,834,000	12,834,000
Biglow Canyon II	22,897,388	22,960,120	22,897,388	22,897,388	22,897,388
Biglow Canyon III	19,839,184	19,893,538	19,839,184	19,839,184	19,839,184
Tucannon River	11,391,322	19,581,482	19,527,980	19,527,980	19,527,980
Total Incremental Cost	**66,961,894**	**75,304,302**	**75,098,552**	**75,098,552**	**75,098,552**

Case 9 (HighGas-RefCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	9,449,666	9,475,555	9,449,666	9,449,666	9,449,666
Biglow Canyon II	17,635,059	17,683,375	17,635,059	17,635,059	17,635,059
Biglow Canyon III	14,014,684	14,053,080	14,014,684	14,014,684	14,014,684
Tucannon River	1,098,365	1,888,070	1,882,911	1,882,911	1,882,911
Total Incremental Cost	**42,197,774**	**43,100,080**	**42,982,320**	**42,982,320**	**42,982,320**

Case 10 (LowGas-HighCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	10,632,894	10,662,025	10,632,894	10,632,894	10,632,894
Biglow Canyon II	19,642,940	19,696,757	19,642,940	19,642,940	19,642,940
Biglow Canyon III	8,348,519	8,371,392	8,348,519	8,348,519	8,348,519
Tucannon River	(9,195,547)	(15,806,983)	(15,763,795)	(15,763,795)	(15,763,795)
Total Incremental Cost	**29,428,806**	**22,923,190**	**22,860,559**	**22,860,559**	**22,860,559**

Case 11 (RefGas-HighCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	8,606,543	8,630,122	8,606,543	8,606,543	8,606,543
Biglow Canyon II	16,534,286	16,579,586	16,534,286	16,534,286	16,534,286
Biglow Canyon III	4,939,262	4,952,794	4,939,262	4,939,262	4,939,262
Tucannon River	(14,956,200)	(25,709,444)	(25,639,200)	(25,639,200)	(25,639,200)
Total Incremental Cost	**15,123,891**	**4,453,058**	**4,440,891**	**4,440,891**	**4,440,891**

Case 12 (HighGas-HighCO2)	2015	2016	2017	2018	2019
Biglow Canyon I	6,993,567	7,012,728	6,993,567	6,993,567	6,993,567
Biglow Canyon II	14,063,012	14,101,541	14,063,012	14,063,012	14,063,012
Biglow Canyon III	2,233,115	2,239,233	2,233,115	2,233,115	2,233,115
Tucannon River	(19,510,396)	(33,538,027)	(33,446,393)	(33,446,393)	(33,446,393)
Total Incremental Cost	**3,779,299**	**(10,184,525)**	**(10,156,699)**	**(10,156,699)**	**(10,156,699)**

Notes:

Although the SunWay, Bellevue and Yamhill solar projects produce RECs that PGE uses for compliance, until the sum of these projects is 20 MW, they are not included in the incremental cost calcualtion (pursuant to OAR 860-083-0100(13)(a)

In addition, the following RPS resources are deemed to be zero incremental cost because they are either low-impact hydro or had an in-service date prior to June 6, 2007 (pursuant to OAR 860-083-0100(1)(i):

- North Fork Upgrade
- Faraday Upgrade
- Round Butte Upgrade
- Pelton-Round Butte Low-Impact Hydro
- PPM Klondike II
- Vansycle Ridge

Tab 3 - Annual Compliance by Resource

Compliance Year	2015		2016		2017		2018		2019	
Facility	MWh	Vintage	MWh	Vintage	MWh	Vintage	MWh	Vintage	MWh	Vintage
Unbundled RECs	-	-	-	-	-	-	-	-	-	-
Unbundled RECs	-	-	-	-	-	-	-	-	-	-
Pelton-Round Butte LIH	-	2009	-	2010	438,000	2012	438,000	2013	438,000	2014
Biglow Canyon I	263,246	2009	204,170	2011	332,030	2013	177,593	2014	94,811	2015
Biglow Canyon II	122,074	2009	215,844	2011	459,029	2013	245,522	2014	131,075	2015
Biglow Canyon III	-	2009	221,009	2011	409,800	2013	219,190	2014	117,018	2015
Tucannon River	-	2009	-	2011	-	2013	-	2014	143,437	2015
Hydro Upgrades	77,569	2009	66,262	2011	104,974	2013	56,148	2014	29,975	2015
PPM Klondike II	142,536	2009	114,306	2011	222,139	2013	118,816	2014	63,431	2015
Vansycle Ridge	52,728	2009	46,568	2011	67,242	2013	35,966	2014	19,201	2015
ETO and Other Solar	830	2009	5,255	2011	37,377	2013	25,673	2014	15,419	2015
Bellevue/Yamhill Solar	-	2009	-	2011	6,023	2013	3,221	2014	1,720	2015
Outback Solar	-	2009	-	2011	19,918	2013	10,653	2014	5,687	2015
Pelton-Round Butte LIH	438,000	2010	438,000	2011	-	2013	-	2014	-	2015
Biglow Canyon I	312,099	2010	337,470	2012	168,452	2014	251,235	2015	256,547	2016
Biglow Canyon II	375,252	2010	410,406	2012	232,884	2014	347,331	2015	354,675	2016
Biglow Canyon III	73,259	2010	360,639	2012	207,908	2014	310,081	2015	316,637	2016
Tucannon River	-	2010	-	2012	-	2014	380,089	2015	665,357	2016
Hydro Upgrades	109,390	2010	113,369	2012	53,258	2014	79,430	2015	81,110	2016
PPM Klondike II	173,511	2010	211,993	2012	112,700	2014	168,084	2015	171,638	2016
Vansycle Ridge	74,902	2010	69,504	2012	34,114	2014	50,879	2015	51,955	2016
ETO and Other Solar	2,309	2010	13,878	2012	24,351	2014	40,860	2015	44,465	2016
Bellevue/Yamhill Solar	-	2010	6,262	2012	3,056	2014	4,557	2015	4,654	2016
Outback Solar	-	2010	1,360	2012	10,105	2014	15,071	2015	15,390	2016
Pelton-Round Butte LIH	-	2011	1,200	2012	-	2014				
Biglow Canyon I	151,200	2011	14,016	2013						
Biglow Canyon II	159,845	2011	19,377	2013						
Biglow Canyon III	163,670	2011	17,299	2013						
Tucannon River	-	2011	-	2013						
Hydro Upgrades	49,071	2011	4,431	2013						
PPM Klondike II	84,650	2011	9,377	2013						
Vansycle Ridge	34,486	2011	2,838	2013						
ETO and Other Solar	3,891	2011	1,578	2013						
Bellevue/Yamhill Solar	-	2011	254	2013						
Outback Solar	-	2011	841	2013						
Total Annual Compliance	**2,864,520**		**2,907,504**		**2,943,360**		**2,978,400**		**3,022,200**	

Compliance Year	2015	2016	2017	2018	2019
Facility	**MWh**	**MWh**	**MWh**	**MWh**	**MWh**
Unbundled RECs	-	-	-	-	-
Pelton-Round Butte LIH	438,000	439,200	438,000	438,000	438,000
Biglow Canyon I	726,545	555,656	500,482	428,829	351,357
Biglow Canyon II	657,172	645,626	691,914	592,853	485,750
Biglow Canyon III	236,929	598,946	617,708	529,271	433,654
Tucannon River	-	-	-	380,089	808,794
Hydro Upgrades	236,030	184,062	158,232	135,578	111,085
PPM Klondike II	400,697	335,676	334,839	286,900	235,070
Vansycle Ridge	162,116	118,910	101,356	86,845	71,156
ETO and Other Solar	7,030	20,710	61,728	66,532	59,884
Bellevue/Yamhill Solar	-	6,516	9,078	7,779	6,373
Outback Solar	-	2,201	30,023	25,725	21,077

Tab 4 - Incremental Cost by Resource

Expected Incremental Cost of Qualifying Electricity

$/MWh

	Base Case RefGas-RefCO2	Case 2 LowGas-NoCO2	Case 3 RefGas-NoCO2	Case 4 HighGas-NoCO2	Case 5 LowGas-LowCO2	Case 6 RefGas-LowCO2	Case 7 HighGas-LowCO2	Case 8 LowGas-RefCO2	Case 9 HighGas-RefCO2	Case 10 LowGas-HighCO2	Case 11 RefGas-HighCO2	Case 12 HighGas-HighCO2	Busbar Energy (MWh)
With Government Incentives:													
Biglow Canyon I	31.68	40.52	34.50	30.22	38.19	32.07	27.68	37.09	27.31	30.73	24.87	20.21	346,046
Biglow Canyon II	41.76	51.65	45.00	40.17	49.01	42.28	37.36	47.86	36.86	41.06	34.56	29.40	478,406
Biglow Canyon III	38.88	57.73	49.59	43.60	49.30	41.08	34.99	46.45	32.81	19.55	11.56	5.23	427,098
Tucannon River	10.78	38.22	27.21	18.53	26.07	15.05	6.36	21.76	2.10	(17.56)	(28.57)	(37.27)	897,473

$000's

	Base Case RefGas-RefCO2	Case 2 LowGas-NoCO2	Case 3 RefGas-NoCO2	Case 4 HighGas-NoCO2	Case 5 LowGas-LowCO2	Case 6 RefGas-LowCO2	Case 7 HighGas-LowCO2	Case 8 LowGas-RefCO2	Case 9 HighGas-RefCO2	Case 10 LowGas-HighCO2	Case 11 RefGas-HighCO2	Case 12 HighGas-HighCO2
Biglow Canyon I	10,961	14,023	11,940	10,457	13,214	11,098	9,578	12,834	9,450	10,633	8,607	6,994
Biglow Canyon II	19,980	24,708	21,529	19,220	23,448	20,228	17,871	22,897	17,635	19,643	16,534	14,063
Biglow Canyon III	16,605	24,654	21,181	18,623	21,056	17,545	14,944	19,839	14,015	8,349	4,939	2,233
Tucannon River	9,675	34,303	24,419	16,631	23,394	13,505	5,711	19,528	1,883	(15,764)	(25,639)	(33,446)

Tab 5 - RECs Generated

RECs Available By Vintage Year												
Facility	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Biglow Canyon I	236,380	343,909	312,099	355,370	337,470	346,046	346,046	346,046	346,994	346,046	346,046	346,046
Biglow Canyon II	-	159,480	375,252	375,689	410,406	478,406	478,406	478,406	479,717	478,406	478,406	478,406
Biglow Canyon III	-	-	73,259	384,679	360,639	427,098	427,098	427,098	428,269	427,098	427,098	427,098
Tucannon River	-	-	-	-	-	-	-	523,526	899,931	897,473	897,473	897,473
Hydro Upgrades	61,002	101,337	109,390	115,333	113,369	109,406	109,406	109,406	109,705	109,406	109,406	109,406
Pelton-Round Butte LIH	439,200	438,000	438,000	438,000	439,200	438,000	438,000	438,000	439,200	438,000	438,000	438,000
PPM Klondike II	129,986	186,211	173,511	198,956	211,993	231,516	231,516	231,516	232,150	231,516	231,516	231,516
Vansycle Ridge	43,322	68,885	74,902	81,054	69,504	70,080	70,080	70,080	70,272	70,080	70,080	70,080
ETO and Other Solar	-	1,084	2,309	9,146	13,878	38,955	50,024	56,279	60,141	65,573	67,493	67,172
Bellevue/Yamhill Solar	-	-	-	-	6,262	6,277	6,277	6,277	6,294	6,277	6,277	6,277
Outback Solar	-	-	-	-	1,360	20,759	20,759	20,759	20,815	20,759	20,759	20,759
Total RECs	**909,890**	**1,298,906**	**1,558,722**	**1,958,227**	**1,964,081**	**2,166,542**	**2,177,611**	**2,707,392**	**3,093,488**	**3,090,633**	**3,092,553**	**3,092,232**

RECs Available Less P-RB LIH	470,690	860,906	1,120,722	1,520,227	1,524,881	1,728,542	1,739,611	2,269,392	2,654,288	2,652,633	2,654,553	2,654,232
From 'Supplies' w/s	470,690	860,906	1,120,722	1,520,227	1,524,881	1,728,542	1,739,611	2,269,392	2,654,288	2,652,633	2,654,553	2,654,232
Difference	-	-	-	-	-	-	-	-	-	-	-	-

Renewables used

Year	**2015**		**2016**		**2017**		**2018**		**2019**	
	MWh	Vintage	MWh	Vintage	MWh	Vintage	MWh	Vintage	MWh	Vintage
Banked	658,983	2009	1,311,412	2011	438,000	2011	438,000	2012	438,000	2014
	1,558,722	2010	1,526,081	2012	1,658,531	2012	892,782	2013	621,774	2015
	646,815	2011	70,011	2013	846,829	2013	1,647,618	2014	1,962,426	2016
	-	2012	-	2014	-	2014	-	2015	-	2017
Total Banked	2,864,520		2,907,504		2,943,360		2,978,400		3,022,200	

Bundled	2,864,520		2,907,504		2,943,360		2,978,400		3,022,200	
Unbundled	-		-		-		-		-	
	-		-		-		-		-	
ACP	-		-		-		-		-	
Total	2,864,520		2,907,504		2,943,360		2,978,400		3,022,200	

Tab 6 - Energy Growth Rates

Year	2015	2016	2017	2018	2019
Growth Rate	1.1%	1.2%	1.7%	1.0%	1.6%

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused **PGE 2013 RPS Implementation Plan** to be served by electronic mail to those parties whose email addresses appear on the attached service list for OPUC Docket No. UM 1568.

Dated at Portland, Oregon, this 3rd day of January 2014.

for Jay Tinker

Jay Tinker
Portland General Electric Company
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Portland, OR 97204
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SERVICE LIST –
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