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

December 29, 2017

Via Email / US Mail

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

RE: **UM 1916 - PGE 2018 Renewable Portfolio Standard Implementation Plan**

Attention Filing Center:

Enclosed please find PGE's 2018 Renewable Portfolio Standard Implementation Plan. This Plan is pursuant to OAR 860-083-0400 and provides information about how PGE will meet its RPS requirement in the years 2019 through 2023.

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 2018 RPS Implementation Plan will be provided via U.S. Mail and are subject to Protective Order No. 17-527.

Attachment B, Incremental Cost Summary, will be provided via U.S. Mail and is also subject to Protective Order No. 17-527.

Electronic notification of this filing is being provided to the UM 1755 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,

Karla Wenzel
Manager, Tariffs and Pricing

cc: UM 1755 Service List
Encl.

Portland General Electric
2018 Renewable Portfolio Standard Implementation Plan[1]
<2019-2023>

As an introduction and summary of PGE's 2018 Renewable Portfolio Standard Implementation Plan, answer the following questions:

Why is PGE submitting this 2018 Implementation 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 through 2014. In 2015 through 2019 the percentage that must come from qualifying resources increases to 15 percent. Beginning in 2020 that percentage further increases to 20 percent of retail load through 2024.

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 implementation plan covering 2019 through 2023, is due January 1, 2018.

What information was used as the basis of this implementation plan (2019-2023 Plan)?

This 2019-2023 Plan is based primarily on existing qualifying renewable resources, and on PGE's 2016 Integrated Resource Plan (IRP), filed November 16, 2016, and the Addendum to PGE's IRP, filed November 9, 2017.

How does the company intend to meet the RPS target?

This implementation plan describes PGE's plan to comply with ORS 469.100 for the years 2019 through 2023. For planning purposes, PGE intends to meet its RPS obligations in these years with primarily bundled RECs from existing resources. Details of PGE's 2019- 2023 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:
2019 – 2,592,800 MWh
2020 – 3,492,613 MWh
2021 – 3,513,090 MWh
2022 – 3,549,037 MWh
2023 – 3,585,439 MWh

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

	Banked	Bundled	Unbundled	ACP
2019	2,592,800	2,592,800	0	0
2020	3,492,613	3,492,613	0	0
2021	3,513,090	3,513,090	0	0
2022	3,549,037	3,549,037	0	0
2023	3,585,439	3,585,439	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:

				2019 Expected Output	
Resource Name	**Type/Source**	**Year**	**State**	**MWh**	**Mwa**
Biglow Phase 1	Wind	2007	OR	341,094	38.9
Biglow Phase 2	Wind	2010	OR	445,109	50.8
Biglow Phase 3	Wind	2011	OR	394,941	45.1
Tucannon River	Wind	2014	WA	892,764	101.9
Vansycle Ridge Wind Farm	Wind	1998	OR	71,163	8.1

Klondike II Wind	Wind	2005	OR	217,434	24.8
Generic 2021	Wind	2021	tbd	876,000	100.0
SunWay I, II, III	Solar	2009/2010	OR	9,150	1.0
Portland Rehabilitation	Solar	2011	OR	1,882	0.2
Baldock	Solar	2012	OR	2,870	0.33
Outback	Solar	2012	OR	20,244	2.3
Bellevue	Solar	2011	OR	3,792	0.4
Yamhill	Solar	2011	OR	2,587	0.3
SPO	Solar	2010–2015	OR	17,840	2.0
Gresham Wastewater Treatment	Biogas	2015	OR	5,143	0.6
North Fork	Hydro Efficiency Upgrade	2001	OR	4,679	0.5
Faraday	Hydro Efficiency Upgrade	various	OR	4,303	0.5
Sullivan	Hydro Efficiency Upgrade	various	OR	7,005	0.8
River Mill	Hydro Efficiency Upgrade	1996–1997	OR	1,480	0.2
Round Butte	Hydro Efficiency Upgrade	2002–2003	OR	83,318	9.5
Pelton-Round Butte	LIH	2007	OR	438,000	50.0

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:

PGE's Addendum to the 2016 IRP includes a new RPS resource addition in 2021. See Attachment A, Tab "Incr Cost of RECs Generated," Cell D9.

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, 2019 through 2023. 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 "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 "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.

See Attachment A, Tab "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 this 2019-2023 Plan and PGE's 2016 IRP and conditions have not materially changed.

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

See Attachment A, Tab "Incremental Cost by Resource." Biglow Canyon, Tucannon, and the Generic Resource in 2021 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 "Incremental Cost Summary." The forecasted incremental cost of compliance will not exceed four percent of the annual revenue requirement in any of the six gas/CO_2 scenarios.

(b): For planning purposes, PGE does not forecast the use of unbundled RECs to meet RPS compliance targets within future compliance years 2019 through 2023; however, PGE reserves the right to do so if the availability and market prices for unbundled RECs warrants it in the future. See PGE's 2016 IRP for further discussion. Attachment B includes the incremental cost if PGE were to use 20% unbundled RECs in each compliance year.

In OPUC Order No. 14-265 acknowledging PGE's 2015-2019 Plan, filed December 31, 2013, OPUC directed PGE to include a scenario in future implementation plans under the reference case that assumes PGE uses unbundled RECs equal to 20% of its annual requirement assuming an unbundled REC price equal to the weighted average price paid for unbundled RECs used in its last compliance report for each year analyzed in the 2017-2021 Plan. Attachment B, which in confidential and subject to protective order, calculates incremental costs based on retiring 20% unbundled RECs in each year the period covered.

OPUC Order No. 16-157, acknowledged PGE's 2016 RPIP, filed December 31, 2015. Then in March 2016, SB 1547 was signed into law. The current rules[2] state, 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

[2] OPUC has opened an RPS rulemaking which will begin in early 2018 to change the rules and ensure they are consistent with provisions in SB 1547.

between January 1 through March 31 of the year following the compliance year. However, with the passage of SB 1547, two significant changes to the prior first-in, first-out method of retiring RECs were:

- eliminating the requirement for first-in, first-out REC retirement,
- creating a distinction between RECs with infinite life and five-year life

(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:
OPUC Order No. 10-173 acknowledged PGE's first implementation plan, 2011-2015 Plan, 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.

OPUC Order No. 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.

OPUC Order No. 12-271 acknowledged PGE's 2014 implementation plan, 2013-2017 Plan, filed December 28, 2011. OPUC required PGE to not include shaping costs in its next implementation plan (2015-2019 Plan), which we have complied with.

OPUC Order No. 14-265 acknowledged PGE's 2015-2019 Plan, filed December 31, 2013. OPUC directed PGE to include a scenario in future implementation plans under the reference case that assumes PGE uses unbundled RECs equal to 20% of its annual requirement assuming an unbundled REC price equal to the weighted average price paid for unbundled RECs used in its last compliance report for each year analyzed in the implementation plan.

OPUC Order No. 16-157, acknowledged PGE's 2016 RPIP (covering the period 2017-2021), filed December 31, 2015. OPUC directed PGE to answer additional questions

related to the passage of SB 1547. Those issues were addressed in Docket No. UM 1788[3].

OAR 860-083-0400(7)
If there are funds in holding accounts under ORS 469A.180(4) and if the 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 2017, PGE has made no ACP and thus has no applicable ACP funds for disposition. The rule is not applicable to PGE at this time.

[3] UM 1788 has not yet been closed. PGE believes we have fulfilled the requirements of OPUC Order No 16-157 and is awaiting closure of the docket.

PGE 2018 RPS Implementation Plan

Attachment A

Incremental Cost of Compliance
2019-2023

Incremental Cost Summary

No Unbundled RECs

	Total Incremental Cost to Comply				
Base Case (RefGas-RefCO2)	**2019**	**2020**	**2021**	**2022**	**2023**
Unbundled RECS					
Biglow Canyon I	$ 2,768,794	$ 11,390,753	$ 11,421,961	$ 11,390,753	$ 11,390,753
Biglow Canyon II	12,616,825	1,187,521	11,463,870	12,616,825	12,616,825
Biglow Canyon III	9,705,385	9,604,276	19,362,565	19,309,662	19,309,662
Tucannon River	6,374,079	6,374,079	6,391,542	6,374,079	6,374,079
Generic Wind Resource 2021	-	-	-	-	-
Total Incremental Cost	**$ 31,465,082**	**$ 28,556,630**	**$ 48,639,938**	**$ 49,691,318**	**$ 49,691,318**
Revenue Requirement ($000)	$ 1,853,330	$ 1,904,616	$ 1,959,452	$ 2,019,092	$ 2,080,598
Percentage of Rev Requirement	**1.7%**	**1.5%**	**2.5%**	**2.5%**	**2.4%**

Case 2 (RefGas-NoCO2)					
Unbundled RECS					
Biglow Canyon I	$ 2,986,413	$ 7,939,124	$ 9,506,623	$ 12,105,919	$ 12,921,228
Biglow Canyon II	13,462,836	534,804	7,808,018	14,086,120	14,676,553
Biglow Canyon III	10,190,155	5,869,956	14,967,661	20,990,798	21,687,913
Tucannon River	12,511,168	(13,661,994)	(4,148,937)	11,639,169	17,357,074
Generic Wind Resource 2021	-	-	-	-	-
Total Incremental Cost	**$ 39,150,572**	**$ 681,889**	**$ 28,133,366**	**$ 58,822,005**	**$ 66,642,768**
Revenue Requirement ($000)	$ 1,853,330	$ 1,904,616	$ 1,959,452	$ 2,019,092	$ 2,080,598
Percentage of Rev Requirement	**2.1%**	**0.0%**	**1.4%**	**2.9%**	**3.2%**

Case 3 (HighGas-RefCO2)					
Unbundled RECS					
Biglow Canyon I	$ 1,929,793	$ 7,939,124	$ 7,960,875	$ 7,939,124	$ 7,939,124
Biglow Canyon II	10,360,131	975,117	9,413,398	10,360,131	10,360,131
Biglow Canyon III	4,620,290	4,572,157	9,217,632	9,192,447	9,192,447
Tucannon River	20,779,519	20,779,519	20,836,450	20,779,519	20,779,519
Generic Wind Resource 2021	-	-	-	-	-
Total Incremental Cost	**$ 37,689,734**	**$ 34,265,917**	**$ 47,428,355**	**$ 48,271,222**	**$ 48,271,222**
Revenue Requirement ($000)	$ 1,853,330	$ 1,904,616	$ 1,959,452	$ 2,019,092	$ 2,080,598
Percentage of Rev Requirement	**2.0%**	**1.8%**	**2.4%**	**2.4%**	**2.3%**

Case 4 (HighGas-NoCO2)					
Unbundled RECS					
Biglow Canyon I	$ 2,304,497	$ 9,480,649	$ 9,506,623	$ 9,480,649	$ 9,480,649
Biglow Canyon II	12,371,739	1,164,453	11,241,181	12,371,739	12,371,739
Biglow Canyon III	5,517,404	5,459,925	11,007,403	10,977,328	10,977,328
Tucannon River	24,814,241	24,814,241	24,882,225	24,814,241	24,814,241
Generic Wind Resource 2021	-	-	-	-	-
Total Incremental Cost	**$ 45,007,881**	**$ 40,919,268**	**$ 56,637,433**	**$ 57,643,957**	**$ 57,643,957**
Revenue Requirement ($000)	$ 1,853,330	$ 1,904,616	$ 1,959,452	$ 2,019,092	$ 2,080,598
Percentage of Rev Requirement	**2.4%**	**2.1%**	**2.9%**	**2.9%**	**2.8%**

Case 5 (LoGas-RefCO2)					
Unbundled RECS					
Biglow Canyon I	$ 2,304,497	$ 9,480,649	$ 9,506,623	$ 9,480,649	$ 9,480,649
Biglow Canyon II	12,371,739	1,164,453	11,241,181	12,371,739	12,371,739
Biglow Canyon III	5,517,404	5,459,925	11,007,403	10,977,328	10,977,328
Tucannon River	24,814,241	24,814,241	24,882,225	24,814,241	24,814,241
Generic Wind Resource 2021	-	-	-	-	-
Total Incremental Cost	**$ 45,007,881**	**$ 40,919,268**	**$ 56,637,433**	**$ 57,643,957**	**$ 57,643,957**
Revenue Requirement ($000)	$ 1,853,330	$ 1,904,616	$ 1,959,452	$ 2,019,092	$ 2,080,598
Percentage of Rev Requirement	**2.4%**	**2.1%**	**2.9%**	**2.9%**	**2.8%**

Case 6 (LoGas-NoCO2)					
Unbundled RECS					
Biglow Canyon I	$ 2,304,497	$ 9,480,649	$ 9,506,623	$ 9,480,649	$ 9,480,649
Biglow Canyon II	12,371,739	1,164,453	11,241,181	12,371,739	12,371,739
Biglow Canyon III	5,517,404	5,459,925	11,007,403	10,977,328	10,977,328
Tucannon River	24,814,241	24,814,241	24,882,225	24,814,241	24,814,241
Generic Wind Resource 2021	-	-	-	-	-
Total Incremental Cost	**$ 45,007,881**	**$ 40,919,268**	**$ 56,637,433**	**$ 57,643,957**	**$ 57,643,957**
Revenue Requirement ($000)	$ 1,853,330	$ 1,904,616	$ 1,959,452	$ 2,019,092	$ 2,080,598
Percentage of Rev Requirement	**2.4%**	**2.1%**	**2.9%**	**2.9%**	**2.8%**

Notes:

Although the ETO and other solar projects produce RECs that PGE uses for compliance, until the sum of these project is 50 MW projects is 50 MW, and included in a Compliance Report, they are not included in the incremental cost calculation (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

PGE 2018 RPS Implementation Plan

Attachment B

Incremental Cost of Compliance
Using 20% Unbundled RECs
2019-2023

Confidential Subject to Protective Order 17-527