



**Portland General Electric**  
121 SW Salmon Street · Portland, Ore. 97204

December 31, 2019

**Via Email / US Mail**

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

**RE: UM 2048 - PGE 2020 Renewable Portfolio Standard Implementation Plan**

Attention Filing Center:

Enclosed please find PGE's 2020 Renewable Portfolio Standard (RPS) Implementation Plan. This Plan is pursuant to Commission Order No. 19-447, ORS 469A.075(2)(a)(b), and OAR 860-083-0040(6) and provides information about how PGE will meet its RPS requirement in the years 2021 through 2025.


The confidential Work Papers containing the underlying models used to prepare the analyses presented in the 2020 RPS Implementation Plan will be provided via U.S. Mail and are subject to Protective Order No. 19-453.

Attachment B will be provided via U.S. Mail and is also subject to Protective Order No. 19-453.

Electronic notification of this filing is being provided to the UM 1916 Service List.

If you have any questions or require further information, please call Stefan Cristea at (503) 464-8033. Please direct all formal correspondence and requests to the following email address: [pge.opuc.filings@pgn.com](mailto:pge.opuc.filings@pgn.com).

Sincerely,

*for*   
Jaki Ferchland  
Manager, Revenue Requirement

cc: UM 1916 Service List  
Enclosure

**Portland General Electric**  
**UM 2048**  
**2020 Renewable Portfolio Standard Implementation Plan**  
**<2021-2025>**

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Pursuant to Public Utility Commission of Oregon (Commission or OPUC) Order No. 19-447, Oregon Revised Statutes (ORS) 469A.052 and 469A.075, and Oregon Administrative Rules (OAR) 860-083-0400(1) and 860-083-0400(6) through (10), PGE submits the enclosed 2020 Renewable Portfolio Standard (RPS) Implementation Plan (RPIP) for the period 2021 through 2025. For the 2020 RPIP filing, Commission Order No. 19-447 authorized a one-time waiver of OARs 860-083-400(2) through (5) requirements because of congruent timing with RPS rulemakings, provided that the utilities include the elements required by statute and as otherwise set forth in the rule.

ORS 469A.052 imposes the requirement that at least 20 percent of electricity sold by a large utility to retail electricity consumers must come from qualifying resources in each of the calendar years 2020 through 2024. In 2025 through 2029, the percentage increases to 27 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.

This 2021-2025 RPS Implementation Plan is based primarily on existing qualifying renewable resources, and on PGE's 2019 Integrated Resource Plan (IRP), filed July 19, 2019. For planning purposes, PGE intends to meet its RPS obligations in these years with primarily bundled RECs from existing resources.

Pursuant to Commission Order No. 19-447, ORS 469A.052, and 469A-075 requirements, the following sections provide details of PGE's 2021-2025 RPIP:

**1. Annual targets for acquisition and use of qualifying electricity.**

PGE's annual megawatt target to comply with the applicable RPS based on the forecast of electricity sales to Oregon retail electricity customers is:

2021 – 3,549,563 MWh

2022 – 3,590,011 MWh

2023 – 3,633,851 MWh

2024 – 3,688,183 MWh

2025 – 5,023,762 MWh

For more detailed information see Attachment A, which is an Excel spreadsheet, Tab "Annual Compliance by Resource"

**2. The estimated cost of meeting the annual targets, including the cost of transmission, the cost of firming, shaping and integrating qualifying**

**electricity, the cost of alternative compliance payments and the cost of acquiring renewable energy certificates.**

- a. Attachment A, Tab “Incremental Cost Summary” provides the estimated cost of meeting the annual RPS compliance targets for the period between 2021 and 2025. In accordance with Commission Order No. 19-447 the cost of transmission, firming, shaping, and integrating qualifying electricity is embedded in the calculation of the incremental cost by resource provided in Attachment A, Tab “Incremental Cost by Resource”.
- b. PGE does not plan to use Alternative Compliance Payments (ACP) in any of the compliance years, 2021 through 2025. A forecast of the cost of using unbundled RECs for compliance is provided in Attachment B, Tab “Incremental Cost Summary”.
- c. Description of base case incremental cost calculations: The base case incremental cost was determined by multiplying the above-market nominal levelized cost in \$/MWh<sup>1</sup> associated with each of the qualifying renewable resources expected to be used for RPS compliance between 2021 and 2025 with the resource’s expected annual generation to meet the compliance requirement.
- d. Incremental cost of RECs generated in each year: Attachment A, Tab “Incr Cost of RECs Generated” provides the incremental cost of RECs generated in each year of the 2021-2025 compliance period.
- e. Sensitivities for the use of 20% unbundled RECs and different gas price scenarios: Attachment B provides sensitivities for the use of 20% unbundled RECs and both Attachments A and B provide low and high gas price scenarios in addition to the reference base gas price scenario.

**3. The cost of new resources that were not included in the 2018 RPIP filing:**

There are four new resources identified in Attachment A, Tab “Incremental Cost Summary” as “Wheatridge”, “Generic Wind Resource Oregon 2023”, “Generic Wind Resource Montana 2023”, and “Generic Wind Resource Washington 2025”. However, there are no incremental costs associated with these resources because PGE does not plan to retire any RECs they will generate in the period 2021 through 2025. PGE rather plans to return to customers the value of the RECs generated during the 2021-2025 Implementation Plan, similar to the proposal in PGE’s 2016 IRP Revised Renewable Action Plan.

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<sup>1</sup> The above-market cost is determined by comparing the qualifying renewable resource nominal levelized cost (\$/MWh) with the nominal levelized cost of a natural gas combined cycle combustion turbine proxy resource.

**4. Explanation of how the 2020 RPIP complies with any conditions specified in previous Commission acknowledgments of Integrated Resource Plans, requests for Production, or RPIPs:**

Commission Order No. 10-173 acknowledged PGE's first implementation plan (i.e., 2011-2015 Implementation Plan), filed December 31, 2009. That order contained no conditions; however, the order recommends development of a standardized template for the 2011 filing. The OPUC Staff and the parties jointly developed a template in 2011 and it remains the format that PGE uses for its implementation plans.

Commission 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.

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

Commission Order No. 14-265 acknowledged PGE's 2015-2019 Implementation Plan, filed December 31, 2013. The order 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.

Commission Order No. 16-157, acknowledged PGE's 2017-2021 Implementation Plan, filed December 31, 2015. The order directed PGE to answer additional questions related to the passage of SB 1547. Those issues were addressed in Docket No. UM 1788<sup>2</sup>.

Commission Order No. 18-185 acknowledged PGE's 2019-2023 Implementation Plan filed December 29, 2017 and supplemented on February 2, 2018. The order contained no conditions.

**5. Major Changes and new resources that have been acknowledged, proposed, and how they would change the Companies' compliance strategy between now and the next RPIP filing schedule for 2021.**

Compared to the 2018 RPIP (Docket No. UM 1916), the 2020 RPIP includes four additional qualifying renewable resources:

- a. The Wheatridge qualifying renewable resource (wind and solar) in PGE's 2016 IRP Revised Renewable Action Plan has been acknowledged by Commission Order No. 18-044 and is expected to be in service by the end of 2020.

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<sup>2</sup> UM 1788 has not yet been closed. PGE believes we have fulfilled the requirements of Commission Order No. 16-157 and is awaiting closure of the docket.

- b. Three wind resources have been proposed by PGE in its 2019 IRP filing (Docket No. LC 73).

The four additional qualifying renewable resources are not expected to change PGE's compliance strategy between this filing and the next RPIP filing scheduled in 2021.

# **UM 2048 - PGE 2020 RPS Implementation Plan**

## *Attachment A*

### **Incremental Cost of Compliance 2021-2025**

## Incremental Cost Summary No Unbundled RECs

Base Case (RefGas-RefCO2)	Total Incremental Cost to Comply				
	2021	2022	2023	2024	2025
Unbundled RECS					
Biglow Canyon I	\$ 12,652,742	\$ 12,618,171	\$ 12,618,171	\$ 12,618,171	\$ 12,652,742
Biglow Canyon II	\$ 12,159,547	\$ 12,126,324	\$ 12,126,324	\$ 12,126,324	\$ 12,205,857
Biglow Canyon III	\$ 23,241,059	\$ 23,177,559	\$ 23,177,559	\$ 23,177,559	\$ 23,241,059
Tucannon River	\$ 17,086,636	\$ 17,039,951	\$ 17,039,951	\$ 17,039,951	\$ 17,086,636
Wheatridge	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Oregon 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Montana 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Washington 2025	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Incremental Cost</b>	<b>\$ 65,139,984</b>	<b>\$ 64,962,005</b>	<b>\$ 64,962,005</b>	<b>\$ 64,962,005</b>	<b>\$ 65,186,294</b>

Case 2 (HighGas-RefCO2)	2021	2022	2023	2024	2025
Unbundled RECS					
Biglow Canyon I	\$ 10,522,546	\$ 10,493,796	\$ 10,493,796	\$ 10,493,796	\$ 10,522,546
Biglow Canyon II	\$ 9,107,845	\$ 9,082,960	\$ 9,082,960	\$ 9,082,960	\$ 9,142,533
Biglow Canyon III	\$ 19,802,594	\$ 19,748,489	\$ 19,748,489	\$ 19,748,489	\$ 19,802,594
Tucannon River	\$ 4,399,511	\$ 4,387,491	\$ 4,387,491	\$ 4,387,491	\$ 4,399,511
Wheatridge	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Oregon 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Montana 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Washington 2025	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Incremental Cost</b>	<b>\$ 43,832,496</b>	<b>\$ 43,712,736</b>	<b>\$ 43,712,736</b>	<b>\$ 43,712,736</b>	<b>\$ 43,867,184</b>

Case 3 (LowGas-RefCO2)	2021	2022	2023	2024	2025
Unbundled RECS					
Biglow Canyon I	\$ 12,927,685	\$ 12,892,363	\$ 12,892,363	\$ 12,892,363	\$ 12,927,685
Biglow Canyon II	\$ 12,530,030	\$ 12,495,795	\$ 12,495,795	\$ 12,495,795	\$ 12,577,752
Biglow Canyon III	\$ 23,714,356	\$ 23,649,563	\$ 23,649,563	\$ 23,649,563	\$ 23,714,356
Tucannon River	\$ 19,604,266	\$ 19,550,702	\$ 19,550,702	\$ 19,550,702	\$ 19,604,266
Wheatridge	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Oregon 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Montana 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Washington 2025	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Incremental Cost</b>	<b>\$ 68,776,337</b>	<b>\$ 68,588,423</b>	<b>\$ 68,588,423</b>	<b>\$ 68,588,423</b>	<b>\$ 68,824,058</b>

**Notes:**

Although the ETO and other solar projects produce RECs that PGE uses for compliance, until the sum of these project 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

**UM 2048 RPS Implementation Plan  
 Incremental Cost for RECs Generated**

<b>Base Case (RefGas-RefCO2)</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Biglow Canyon I	\$ 12,618,171	\$ 12,618,171	\$ 12,618,171	\$ 12,652,742	\$ 12,618,171
Biglow Canyon II	\$ 12,126,324	\$ 12,126,324	\$ 12,126,324	\$ 12,159,547	\$ 12,126,324
Biglow Canyon III	\$ 23,177,559	\$ 23,177,559	\$ 23,177,559	\$ 23,241,059	\$ 23,177,559
Tucannon River	\$ 17,039,951	\$ 17,039,951	\$ 17,039,951	\$ 17,086,636	\$ 17,039,951
Wheatridge	-	-	-	-	-
Generic Wind Resource Oregon 2023	-	-	-	-	-
Generic Wind Resource Montana 2023	-	-	-	-	-
Generic Wind Resource Washington 2025	-	-	-	-	-
<b>Total Incremental Cost</b>	<b>64,962,005</b>	<b>64,962,005</b>	<b>64,962,005</b>	<b>65,139,984</b>	<b>64,962,005</b>

<b>Case 2 (HighGas-RefCO2)</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Unbundled RECS					
Biglow Canyon I	\$ 10,493,796	\$ 10,493,796	\$ 10,493,796	\$ 10,522,546	\$ 10,493,796
Biglow Canyon II	\$ 9,082,960	\$ 9,082,960	\$ 9,082,960	\$ 9,107,845	\$ 9,082,960
Biglow Canyon III	\$ 19,748,489	\$ 19,748,489	\$ 19,748,489	\$ 19,802,594	\$ 19,748,489
Tucannon River	\$ 4,387,491	\$ 4,387,491	\$ 4,387,491	\$ 4,399,511	\$ 4,387,491
Wheatridge	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Oregon 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Montana 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Washington 2025	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Incremental Cost</b>	<b>\$ 43,712,736</b>	<b>\$ 43,712,736</b>	<b>\$ 43,712,736</b>	<b>\$ 43,832,496</b>	<b>\$ 43,712,736</b>

<b>Case 3 (LowGas-RefCO2)</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Unbundled RECS					
Biglow Canyon I	\$ 12,892,363	\$ 12,892,363	\$ 12,892,363	\$ 12,927,685	\$ 12,892,363
Biglow Canyon II	\$ 12,495,795	\$ 12,495,795	\$ 12,495,795	\$ 12,530,030	\$ 12,495,795
Biglow Canyon III	\$ 23,649,563	\$ 23,649,563	\$ 23,649,563	\$ 23,714,356	\$ 23,649,563
Tucannon River	\$ 19,550,702	\$ 19,550,702	\$ 19,550,702	\$ 19,604,266	\$ 19,550,702
Wheatridge	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Oregon 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Montana 2023	\$ -	\$ -	\$ -	\$ -	\$ -
Generic Wind Resource Washington 2025	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Incremental Cost</b>	<b>\$ 68,588,423</b>	<b>\$ 68,588,423</b>	<b>\$ 68,588,423</b>	<b>\$ 68,776,337</b>	<b>\$ 68,588,423</b>

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





Qualifying Facilities	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
ETO and Other Solar	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
Wheatridge	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
2023 Addition - OR	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
2023 Addition - MT	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
2025 Addition - WA	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
Null	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
Null	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
Purchased Bundled	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
Unbundled RECs	-	2010	-	2010	-	2010	-	2010	-	2010	-	2010
Low Impact Hydro	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Biogas Cogen	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Biglow Canyon I	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Biglow Canyon II	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Biglow Canyon III	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Tucannon River	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Vansycle Ridge	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
PPM Klondike II	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Hydro Upgrades	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
enXco Solar	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
SPO Solar	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Outback Solar	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Qualifying Facilities	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
ETO and Other Solar	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Wheatridge	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
2023 Addition - OR	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
2023 Addition - MT	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
2025 Addition - WA	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Null	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Null	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Purchased Bundled	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Unbundled RECs	-	2011	-	2011	-	2011	-	2011	-	2011	-	2011
Low Impact Hydro	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Biogas Cogen	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Biglow Canyon I	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Biglow Canyon II	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Biglow Canyon III	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Tucannon River	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Vansycle Ridge	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
PPM Klondike II	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Hydro Upgrades	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
enXco Solar	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
SPO Solar	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Outback Solar	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Qualifying Facilities	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
ETO and Other Solar	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Wheatridge	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
2023 Addition - OR	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
2023 Addition - MT	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
2025 Addition - WA	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Null	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Null	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Purchased Bundled	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Unbundled RECs	-	2012	-	2012	-	2012	-	2012	-	2012	-	2012
Low Impact Hydro	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Biogas Cogen	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Biglow Canyon I	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Biglow Canyon II	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Biglow Canyon III	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Tucannon River	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Vansycle Ridge	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
PPM Klondike II	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Hydro Upgrades	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
enXco Solar	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
SPO Solar	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Outback Solar	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Qualifying Facilities	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
ETO and Other Solar	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Wheatridge	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
2023 Addition - OR	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
2023 Addition - MT	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
2025 Addition - WA	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Null	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Null	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Purchased Bundled	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Unbundled RECs	-	2013	-	2013	-	2013	-	2013	-	2013	-	2013
Low Impact Hydro	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Biogas Cogen	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014

Biglow Canyon I	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Biglow Canyon II	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Biglow Canyon III	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Tucannon River	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Vansycle Ridge	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
PPM Klondike II	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Hydro Upgrades	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
enXco Solar	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
SPO Solar	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Outback Solar	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Qualifying Facilities	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
ETO and Other Solar	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Wheatridge	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
2023 Addition - OR	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
2023 Addition - MT	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
2025 Addition - WA	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Null	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Null	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Purchased Bundled	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Unbundled RECs	-	2014	-	2014	-	2014	-	2014	-	2014	-	2014
Low Impact Hydro	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Biogas Cogen	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Biglow Canyon I	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Biglow Canyon II	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Biglow Canyon III	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Tucannon River	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Vansycle Ridge	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
PPM Klondike II	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Hydro Upgrades	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
enXco Solar	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
SPO Solar	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Outback Solar	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Qualifying Facilities	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
ETO and Other Solar	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Wheatridge	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
2023 Addition - OR	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
2023 Addition - MT	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
2025 Addition - WA	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Null	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Null	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Purchased Bundled	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Unbundled RECs	-	2015	-	2015	-	2015	-	2015	-	2015	-	2015
Low Impact Hydro	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Biogas Cogen	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Biglow Canyon I	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Biglow Canyon II	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Biglow Canyon III	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Tucannon River	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Vansycle Ridge	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
PPM Klondike II	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Hydro Upgrades	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
enXco Solar	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
SPO Solar	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Outback Solar	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Qualifying Facilities	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
ETO and Other Solar	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Wheatridge	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
2023 Addition - OR	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
2023 Addition - MT	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
2025 Addition - WA	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Null	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Null	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Purchased Bundled	84,057	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Unbundled RECs	-	2016	-	2016	-	2016	-	2016	-	2016	-	2016
Low Impact Hydro	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Biogas Cogen	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Biglow Canyon I	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Biglow Canyon II	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Biglow Canyon III	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Tucannon River	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Vansycle Ridge	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
PPM Klondike II	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Hydro Upgrades	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
enXco Solar	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
SPO Solar	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Outback Solar	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Qualifying Facilities	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
ETO and Other Solar	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Wheatridge	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
2023 Addition - OR	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
2023 Addition - MT	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017

2025 Addition - WA	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Null	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Null	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Purchased Bundled	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Unbundled RECs	-	2017	-	2017	-	2017	-	2017	-	2017	-	2017
Low Impact Hydro	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Biogas Cogen	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Biglow Canyon I	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Biglow Canyon II	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Biglow Canyon III	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Tucannon River	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Vansycle Ridge	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
PPM Klondike II	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Hydro Upgrades	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
enXco Solar	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
SPO Solar	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Outback Solar	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Qualifying Facilities	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
ETO and Other Solar	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Wheatridge	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
2023 Addition - OR	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
2023 Addition - MT	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
2025 Addition - WA	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Null	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Null	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Purchased Bundled	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Unbundled RECs	-	2018	-	2018	-	2018	-	2018	-	2018	-	2018
Low Impact Hydro	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Biogas Cogen	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Biglow Canyon I	322,457	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Biglow Canyon II	179,849	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Biglow Canyon III	348,742	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Tucannon River	826,423	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Vansycle Ridge	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
PPM Klondike II	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Hydro Upgrades	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
enXco Solar	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
SPO Solar	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Outback Solar	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Qualifying Facilities	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
ETO and Other Solar	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Wheatridge	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
2023 Addition - OR	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
2023 Addition - MT	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
2025 Addition - WA	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Null	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Null	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Purchased Bundled	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Unbundled RECs	-	2019	-	2019	-	2019	-	2019	-	2019	-	2019
Low Impact Hydro	439,200	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Biogas Cogen	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Biglow Canyon I	-	2020	323,340	2020	-	2020	-	2020	-	2020	-	2020
Biglow Canyon II	-	2020	395,888	2020	-	2020	-	2020	-	2020	-	2020
Biglow Canyon III	-	2020	349,698	2020	-	2020	-	2020	-	2020	-	2020
Tucannon River	-	2020	828,687	2020	-	2020	-	2020	-	2020	-	2020
Vansycle Ridge	67,257	2020	-	2020	-	2020	-	2020	-	2020	-	2020
PPM Klondike II	208,524	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Hydro Upgrades	109,888	2020	-	2020	-	2020	-	2020	-	2020	-	2020
enXco Solar	6,046	2020	-	2020	-	2020	-	2020	-	2020	-	2020
SPO Solar	19,579	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Outback Solar	63	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Qualifying Facilities	887,961	2020	67,966	2020	-	2020	-	2020	-	2020	-	2020
ETO and Other Solar	32,800	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Wheatridge	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
2023 Addition - OR	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
2023 Addition - MT	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
2025 Addition - WA	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Null	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Null	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Purchased Bundled	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Unbundled RECs	-	2020	-	2020	-	2020	-	2020	-	2020	-	2020
Low Impact Hydro	-	2021	438,000	2021	-	2021	-	2021	-	2021	-	2021
Biogas Cogen	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
Biglow Canyon I	-	2021	-	2021	322,457	2021	-	2021	-	2021	-	2021
Biglow Canyon II	-	2021	-	2021	394,806	2021	-	2021	-	2021	-	2021
Biglow Canyon III	-	2021	-	2021	348,742	2021	-	2021	-	2021	-	2021
Tucannon River	-	2021	-	2021	826,423	2021	-	2021	-	2021	-	2021
Vansycle Ridge	-	2021	67,073	2021	-	2021	-	2021	-	2021	-	2021
PPM Klondike II	-	2021	207,954	2021	-	2021	-	2021	-	2021	-	2021
Hydro Upgrades	-	2021	142,078	2021	-	2021	-	2021	-	2021	-	2021
enXco Solar	-	2021	6,030	2021	-	2021	-	2021	-	2021	-	2021
SPO Solar	-	2021	19,526	2021	-	2021	-	2021	-	2021	-	2021
Outback Solar	-	2021	554	2021	-	2021	-	2021	-	2021	-	2021
Qualifying Facilities	-	2021	670,060	2021	357,321	2021	-	2021	-	2021	-	2021

ETO and Other Solar	-	2021	32,710	2021	-	2021	-	2021	-	2021	-	2021
Wheatridge	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
2023 Addition - OR	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
2023 Addition - MT	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
2025 Addition - WA	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
Null	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
Null	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
Purchased Bundled	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
Unbundled RECs	-	2021	-	2021	-	2021	-	2021	-	2021	-	2021
Low Impact Hydro	-	2022	-	2022	438,000	2022	-	2022	-	2022	-	2022
Biogas Cogen	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
Biglow Canyon I	-	2022	-	2022	-	2022	322,457	2022	-	2022	-	2022
Biglow Canyon II	-	2022	-	2022	-	2022	394,806	2022	-	2022	-	2022
Biglow Canyon III	-	2022	-	2022	-	2022	348,742	2022	-	2022	-	2022
Tucannon River	-	2022	-	2022	-	2022	826,423	2022	-	2022	-	2022
Vansycle Ridge	-	2022	-	2022	67,073	2022	-	2022	-	2022	-	2022
PPM Klondike II	-	2022	-	2022	207,954	2022	-	2022	-	2022	-	2022
Hydro Upgrades	-	2022	-	2022	142,078	2022	-	2022	-	2022	-	2022
enXco Solar	-	2022	-	2022	6,030	2022	-	2022	-	2022	-	2022
SPO Solar	-	2022	-	2022	19,526	2022	-	2022	-	2022	-	2022
Outback Solar	-	2022	-	2022	554	2022	-	2022	-	2022	-	2022
Qualifying Facilities	-	2022	-	2022	426,337	2022	601,044	2022	-	2022	-	2022
ETO and Other Solar	-	2022	-	2022	32,710	2022	-	2022	-	2022	-	2022
Wheatridge	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
2023 Addition - OR	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
2023 Addition - MT	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
2025 Addition - WA	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
Null	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
Null	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
Purchased Bundled	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
Unbundled RECs	-	2022	-	2022	-	2022	-	2022	-	2022	-	2022
Low Impact Hydro	-	2023	-	2023	-	2023	438,000	2023	-	2023	-	2023
Biogas Cogen	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
Biglow Canyon I	-	2023	-	2023	-	2023	-	2023	322,457	2023	-	2023
Biglow Canyon II	-	2023	-	2023	-	2023	-	2023	394,806	2023	-	2023
Biglow Canyon III	-	2023	-	2023	-	2023	-	2023	348,742	2023	-	2023
Tucannon River	-	2023	-	2023	-	2023	-	2023	826,423	2023	-	2023
Vansycle Ridge	-	2023	-	2023	-	2023	67,073	2023	-	2023	-	2023
PPM Klondike II	-	2023	-	2023	-	2023	207,954	2023	-	2023	-	2023
Hydro Upgrades	-	2023	-	2023	-	2023	142,078	2023	-	2023	-	2023
enXco Solar	-	2023	-	2023	-	2023	6,030	2023	-	2023	-	2023
SPO Solar	-	2023	-	2023	-	2023	19,526	2023	-	2023	-	2023
Outback Solar	-	2023	-	2023	-	2023	554	2023	-	2023	-	2023
Qualifying Facilities	-	2023	-	2023	-	2023	226,455	2023	800,927	2023	-	2023
ETO and Other Solar	-	2023	-	2023	-	2023	32,710	2023	-	2023	-	2023
Wheatridge	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
2023 Addition - OR	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
2023 Addition - MT	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
2025 Addition - WA	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
Null	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
Null	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
Purchased Bundled	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
Unbundled RECs	-	2023	-	2023	-	2023	-	2023	-	2023	-	2023
Low Impact Hydro	-	2024	-	2024	-	2024	-	2024	439,200	2024	-	2024
Biogas Cogen	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
Biglow Canyon I	-	2024	-	2024	-	2024	-	2024	-	2024	323,340	2024
Biglow Canyon II	-	2024	-	2024	-	2024	-	2024	-	2024	395,888	2024
Biglow Canyon III	-	2024	-	2024	-	2024	-	2024	-	2024	349,698	2024
Tucannon River	-	2024	-	2024	-	2024	-	2024	-	2024	828,687	2024
Vansycle Ridge	-	2024	-	2024	-	2024	-	2024	67,257	2024	-	2024
PPM Klondike II	-	2024	-	2024	-	2024	-	2024	208,524	2024	-	2024
Hydro Upgrades	-	2024	-	2024	-	2024	-	2024	142,467	2024	-	2024
enXco Solar	-	2024	-	2024	-	2024	-	2024	6,046	2024	-	2024
SPO Solar	-	2024	-	2024	-	2024	-	2024	19,579	2024	-	2024
Outback Solar	-	2024	-	2024	-	2024	-	2024	555	2024	-	2024
Qualifying Facilities	-	2024	-	2024	-	2024	-	2024	69,616	2024	960,580	2024
ETO and Other Solar	-	2024	-	2024	-	2024	-	2024	41,584	2024	-	2024
Wheatridge	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
2023 Addition - OR	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
2023 Addition - MT	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
2025 Addition - WA	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
Null	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
Null	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
Purchased Bundled	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
Unbundled RECs	-	2024	-	2024	-	2024	-	2024	-	2024	-	2024
Low Impact Hydro	-	2025	-	2025	-	2025	-	2025	-	2025	438,000	2025
Biogas Cogen	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Biglow Canyon I	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Biglow Canyon II	-	2025	-	2025	-	2025	-	2025	-	2025	1,508	2025
Biglow Canyon III	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Tucannon River	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Vansycle Ridge	-	2025	-	2025	-	2025	-	2025	-	2025	67,073	2025
PPM Klondike II	-	2025	-	2025	-	2025	-	2025	-	2025	207,954	2025
Hydro Upgrades	-	2025	-	2025	-	2025	-	2025	-	2025	142,078	2025

enXco Solar	-	2025	-	2025	-	2025	-	2025	-	2025	6,030	2025
SPO Solar	-	2025	-	2025	-	2025	-	2025	-	2025	19,526	2025
Outback Solar	-	2025	-	2025	-	2025	-	2025	-	2025	554	2025
Qualifying Facilities	-	2025	-	2025	-	2025	-	2025	-	2025	1,232,618	2025
ETO and Other Solar	-	2025	-	2025	-	2025	-	2025	-	2025	50,230	2025
Wheatridge	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
2023 Addition - OR	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
2023 Addition - MT	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
2025 Addition - WA	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Null	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Null	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Purchased Bundled	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
Unbundled RECs	-	2025	-	2025	-	2025	-	2025	-	2025	-	2025
<b>Totals</b>	<b>3,532,846</b>		<b>3,549,563</b>		<b>3,590,011</b>		<b>3,633,851</b>		<b>3,688,183</b>		<b>5,023,762</b>	

Compliance Year	2020	2021	2022	2023	2024	2025
Resource	MWh	MWh	MWh	MWh	MWh	MWh
Low Impact Hydro	439,200	438,000	438,000	438,000	439,200	438,000
Biogas Cogen	-	-	-	-	-	-
Biglow Canyon I	322,457	323,340	322,457	322,457	322,457	323,340
Biglow Canyon II	179,849	395,888	394,806	394,806	394,806	397,395
Biglow Canyon III	348,742	349,698	348,742	348,742	348,742	349,698
Tucannon River	826,423	828,687	826,423	826,423	826,423	828,687
Vansycle Ridge	67,257	67,073	67,073	67,073	67,257	67,073
PPM Klondike II	208,524	207,954	207,954	207,954	208,524	207,954
Hydro Upgrades	109,888	142,078	142,078	142,078	142,467	142,078
enXco Solar	6,046	6,030	6,030	6,030	6,046	6,030
SPO Solar	19,579	19,526	19,526	19,526	19,579	19,526
Outback Solar	63	554	554	554	555	554
Qualifying Facilities	887,961	738,026	783,659	827,499	870,543	2,193,198
ETO and Other Solar	32,800	32,710	32,710	32,710	41,584	50,230
Wheatridge	-	-	-	-	-	-
2023 Addition - OR	-	-	-	-	-	-
2023 Addition - MT	-	-	-	-	-	-
2025 Addition - WA	-	-	-	-	-	-
Null	-	-	-	-	-	-
Null	-	-	-	-	-	-
Purchased Bundled	84,057	-	-	-	-	-
Unbundled RECs	-	-	-	-	-	-
<b>Total</b>	<b>3,532,846</b>	<b>3,549,563</b>	<b>3,590,011</b>	<b>3,633,851</b>	<b>3,688,183</b>	<b>5,023,762</b>
<b>Retirement Check:</b>	<b>3,532,846</b>	<b>3,549,563</b>	<b>3,590,011</b>	<b>3,633,851</b>	<b>3,688,183</b>	<b>5,023,762</b>

**Tab 5 - RECs Generated**

Resource	2020	2021	2022	2023	2024	2025
Low Impact Hydro	439,200	438,000	438,000	438,000	439,200	438,000
Biogas Cogen	-	-	-	-	-	-
Biglow Canyon I	323,340	322,457	322,457	322,457	323,340	322,457
Biglow Canyon II	395,888	394,806	394,806	394,806	395,888	394,806
Biglow Canyon III	349,698	348,742	348,742	348,742	349,698	348,742
Tucannon River	828,687	826,423	826,423	826,423	828,687	826,423
Vansycle Ridge	67,257	67,073	67,073	67,073	67,257	67,073
PPM Klondike II	208,524	207,954	207,954	207,954	208,524	207,954
Hydro Upgrades	109,888	142,078	142,078	142,078	142,467	142,078
enXco Solar	6,046	6,030	6,030	6,030	6,046	6,030
SPO Solar	19,579	19,526	19,526	19,526	19,579	19,526
Outback Solar	63	554	554	554	555	554
Qualifying Facilities	955,927	1,027,382	1,027,382	1,027,382	1,030,196	1,232,618
ETO and Other Solar	32,800	32,710	32,710	32,710	41,584	50,230
Wheatridge	-	-	-	-	-	-
2023 Addition - OR	-	-	-	-	-	-
2023 Addition - MT	-	-	-	-	-	-
2025 Addition - WA	-	-	-	-	-	-
Null	-	-	-	-	-	-
Null	-	-	-	-	-	-
Purchased Bundled	-	-	-	-	-	-
Unbundled RECs	-	-	-	-	-	-
<b>Total RECs</b>	<b>3,736,896</b>	<b>3,833,734</b>	<b>3,833,734</b>	<b>3,833,734</b>	<b>3,853,021</b>	<b>4,056,490</b>
RECs Available Less LIH	3,297,696	3,395,734	3,395,734	3,395,734	3,413,821	3,618,490

Resource	2020	2021	2022	2023	2024	2025
Low Impact Hydro	-	-	-	-	-	-
Biogas Cogen	-	-	-	-	-	-
Biglow Canyon I	-	-	-	-	-	-
Biglow Canyon II	-	-	-	-	-	-
Biglow Canyon III	-	-	-	-	-	-
Tucannon River	-	-	-	-	-	-
Vansycle Ridge	-	-	-	-	-	-
PPM Klondike II	-	-	-	-	-	-
Hydro Upgrades	-	-	-	-	-	-
enXco Solar	-	-	-	-	-	-
SPO Solar	-	-	-	-	-	-
Outback Solar	-	-	-	-	-	-
Qualifying Facilities	-	-	-	-	-	59,776
ETO and Other Solar	-	-	-	-	-	-
Wheatridge	-	-	-	-	-	1,038,843
2023 Addition - OR	-	-	-	-	-	-
2023 Addition - MT	-	-	-	-	-	-
2025 Addition - WA	-	-	-	-	-	-
Null	-	-	-	-	-	-
Null	-	-	-	-	-	-
Purchased Bundled	-	-	-	-	-	-
Unbundled RECs	-	-	-	-	-	-
<b>Total RECs</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,098,619</b>
RECs Available Less LIH	-	-	-	-	-	1,098,619

**Annual Form of Compliance**

Compliance Year	2020		2021		2022	
REC Form	MWh	Vintage	MWh	Vintage	MWh	Vintage
Banked RECs	-	2007	-	2007	-	2007
	-	2008	-	2008	-	2008
	-	2009	-	2009	-	2009
	-	2010	-	2010	-	2010
	-	2011	-	2011	-	2011
	-	2012	-	2012	-	2012
	-	2013	-	2013	-	2013
	-	2014	-	2014	-	2014
	-	2015	-	2015	-	2015
	84,057	2016	-	2016	-	2016
	-	2017	-	2017	-	2017
	-	2018	-	2018	-	2018
	1,677,471	2019	-	2019	-	2019
	1,771,318	2020	1,965,578	2020	-	2020
	-	2021	1,583,984	2021	2,249,749	2021
	-	2022	-	2022	1,340,262	2022
	-	2023	-	2023	-	2023
	-	2024	-	2024	-	2024
	-	2025	-	2025	-	2025
<b>Total Bundled RECs</b>	<b>3,532,846</b>		<b>3,549,563</b>		<b>3,590,011</b>	
Unbundled RECs	-		-		-	
ACP	-		-		-	
<b>Total RECs + ACP</b>	<b>3,532,846</b>		<b>3,549,563</b>		<b>3,590,011</b>	
<b>Total Need</b>	<b>3,532,846</b>		<b>3,549,563</b>		<b>3,590,011</b>	
<b>Retirement Check:</b>	<b>3,532,846</b>		<b>3,549,563</b>		<b>3,590,011</b>	



2023		2024		2025	
MWh	Vintage	MWh	Vintage	MWh	Vintage
-	2007	-	2007	-	2007
-	2008	-	2008	-	2008
-	2009	-	2009	-	2009
-	2010	-	2010	-	2010
-	2011	-	2011	-	2011
-	2012	-	2012	-	2012
-	2013	-	2013	-	2013
-	2014	-	2014	-	2014
-	2015	-	2015	-	2015
-	2016	-	2016	-	2016
-	2017	-	2017	-	2017
-	2018	-	2018	-	2018
-	2019	-	2019	-	2019
-	2020	-	2020	-	2020
-	2021	-	2021	-	2021
2,493,472	2022	-	2022	-	2022
1,140,379	2023	2,693,355	2023	-	2023
-	2024	994,828	2024	2,858,193	2024
-	2025	-	2025	2,165,570	2025
<b>3,633,851</b>		<b>3,688,183</b>		<b>5,023,762</b>	
-		-		-	
-		-		-	
<b>3,633,851</b>		<b>3,688,183</b>		<b>5,023,762</b>	
<b>3,633,851</b>		<b>3,688,183</b>		<b>5,023,762</b>	
<b>3,633,851</b>		<b>3,688,183</b>		<b>5,023,762</b>	

**Incremental Cost by Resource**  
 No Unbundled RECs

	Expected Incremental Cost of Qualifying Electricity							
	\$/MWh			2021 Busbar Energy (MWh)	\$/000's			
	Base Case	Case 3	Case 5		Base Case	Case 3	Case 5	
RefGas- RefCO2	HighGas- RefCO2	LoGas- RefCO2		RefGas- RefCO2	HighGas- RefCO2	LoGas- RefCO2		
<b>Staged Build</b>								
Biglow Canyon I	39.131	32.543	39.982	322,457	\$ 12,618	\$ 10,494	\$ 12,892	
Biglow Canyon II	30.715	23.006	31.650	394,806	\$ 12,126	\$ 9,083	\$ 12,496	
Biglow Canyon III	66.460	56.628	67.814	348,742	\$ 23,178	\$ 19,748	\$ 23,650	
Tucannon River	20.619	5.309	23.657	826,423	\$ 17,040	\$ 4,387	\$ 19,551	
Wheatridge	(7.274)	(33.176)	0.135	0	\$ -	\$ -	\$ -	
Generic Wind Resource Oregon 2023	(8.803)	(39.178)	0.195	0	\$ -	\$ -	\$ -	
Generic Wind Resource Montana 2023	(8.318)	(38.693)	0.680	0	\$ -	\$ -	\$ -	
Generic Wind Resource Washington 2025	8.547	(24.798)	19.255	0	\$ -	\$ -	\$ -	

# **UM 2048 - PGE 2020 RPS Implementation Plan**

## *Attachment B*

### **Incremental Cost of Compliance Using 20% Unbundled RECs 2021-2025**

**Confidential Subject to Protective Order 19-453**