

December 30, 2021

Via Electronic Filing

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

RE: UM 2216 - PGE 2022 Renewable Portfolio Standard Implementation Plan

Filing Center,

Enclosed please find PGE's 2022 Renewable Portfolio Standard (RPS) Implementation Plan. This Plan is pursuant to Commission Order No. 20-135, 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 2023 through 2027.

The confidential Work Papers containing the underlying models used to prepare the analyses presented in the 2022 RPS Implementation Plan will be provided via Email and are subject to Protective Order No. 21-487.

Attachment A contains the Incremental Cost of Compliance 2023-2027.

Attachment B contains the Incremental Cost of Compliance using 20% Unbundled RECs. Attachment B contains protected information and is subject to General Protective Order No. 21-487.

Electronic notification of this filing is being provided to the UM 2216 Service List.

If you have any questions or require further information, please call Jaki Ferchland at (503) 464-7488. Please direct all formal correspondence and requests to the following email address: pge.opuc.filings@pgn.com.

Sincerely,

/s/ Jaki Ferchland
Jaki Ferchland
Manager, Revenue Requirement

cc: UM 2216 Service List

Enclosure

Portland General Electric UM 2216

2022 Renewable Portfolio Standard Implementation Plan <2023-2027>

Pursuant to Oregon Public Utility Commission (Commission or OPUC) Order No. 20-135, 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 2022 Renewable Portfolio Standard (RPS) Implementation Plan (RPIP) for the period 2023 through 2027. For the 2022 RPIP filing, Commission Order No. 21-487 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. From 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 OPUC.

This 2023-2027 RPIP is based primarily on existing qualifying renewable resources, and on PGE's 2019 Integrated Resource Plan (IRP) Update, filed January 29, 2021. 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. 21-487, ORS 469A.052, and 469A-075 requirements, the following sections provide details of PGE's 2023-2027 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:

2023 – 3,756,740 MWh

2024 - 3.817,400 MWh

2025 – 5,218,803 MWh

2026 – 5,279,796 MWh

2027 – 5,338,683 MWh

For more detailed information see Attachment A, 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 (RECs).

- a. Attachment A, tab "Incremental Cost Summary" provides the estimated cost of meeting the annual RPS compliance targets for the period between 2023 and 2027. In accordance with Commission Order No. 21-487 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, 2023 through 2027. 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 \$/MWh¹ associated with each of the qualifying renewable resources expected to be used for RPS compliance between 2023 and 2027 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 2023-2027 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 2020 RPIP filing:

There are two new resources identified in Attachment A, tab "Incremental Cost Summary" as "Generic Wind Resource Oregon 2025" and "Generic Wind Resource Montana 2025". However, there are no incremental costs associated with these

¹ 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.

² PGE's 2019 IRP Action Plan and 2021 RFP (Docket No. UM 2166) discuss one new 150 MWa resource. However, in PGE's IRP portfolio analysis (and hence 2022 RPIP), this 150 MWa resource is split into two resources – Generic Wind Resource Oregon 2025 and Generic Wind Resource Montana 2025. See PGE's response to item 5. for further detail.

resources because PGE does not plan to retire any RECs they will generate in the period 2023 through 2027. PGE rather plans to return to customers the value of the RECs generated during the 2023-2027 RPIP, similar to the proposal in PGE's 2019 IRP Action Plan.

4. Explanation of how the 2022 RPIP complies with any conditions specified in previous Commission acknowledgments of IRPs, requests for Production, or RPIPs:

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

Commission Order No. 10-457 acknowledged PGE's 2009 IRP and 2010 Addendum, with conditions. No conditions pertain directly to RPIP filing requirements. PGE filed its Draft 2013 IRP on November 22, 2013.

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

Commission Order No. 14-265 acknowledged PGE's 2015-2019 RPIP, filed December 31, 2013. The Order directed PGE to include a scenario in future RPIPs 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 RPS compliance report for each year analyzed in the RPIP.

Commission Order No. 16-157 acknowledged PGE's 2017-2021 RPIP, 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.

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

Commission Order No. 19-447 adopted Staff's recommendation to streamline the 2020 RPIP filings (for PGE and PacifiCorp), waiving the requirements under OAR 860-083-0400(2)-(5) for the 2021-2025 compliance period.

Commission Order No. 20-135 acknowledged PGE's 2021-2025 RPIP, filed December 31, 2019. The Order contained no conditions.

Commission Order No. 21-487 adopted Staff's recommendation to streamline the 2022 RPIP filings (for PGE and PacifiCorp), waiving the requirements under OAR 860-083-0400(2)-(5) for the 2023-2027 compliance period.

5. Major changes and new resources that have been acknowledged and/or proposed, and how they would change the Companies' compliance strategy between now and the next RPIP filing scheduled for 2023.

Compared to the 2020 RPIP (Docket No. UM 2048), the 2022 RPIP includes one additional qualifying renewable resource:

a. One 150 MWa qualifying resource to be added in the 2021 RFP (Docket No. UM 2166). Following the 2019 IRP Action Plan, this resource is modeled in the 2022 RPIP as a 100 MW Gorge (Oregon) wind addition & 261 MW Montana wind addition with a 2025 commercial operation date.

This one additional qualifying renewable resource is not expected to change PGE's compliance strategy between this filing and the next RPIP filing scheduled in 2023.

Incremental Cost Summary No Unbundled RECs

| | | Total Incremental Cost to Comply | | | | | | | | | | | |
|------------------------------------|------|----------------------------------|------|------------|------|------------|------|------------|----|-------------|--|--|--|
| Base Case (RefGas-RefCO2) | 2023 | | 2024 | | 2025 | | 2026 | | | 2027 | | | |
| Unbundled RECS | | | | | | | | | | | | | |
| Biglow Canyon I | \$ | 11,254,116 | \$ | 11,254,116 | \$ | 22,532,582 | \$ | 11,254,116 | \$ | 11,254,116 | | | |
| Biglow Canyon II | \$ | 9,549,508 | \$ | 9,549,508 | \$ | 19,118,893 | \$ | 9,549,508 | \$ | 16,921,486 | | | |
| Biglow Canyon III | \$ | 21,712,910 | \$ | 21,756,238 | \$ | 21,712,910 | \$ | 21,712,910 | \$ | 21,712,910 | | | |
| Tucannon River | \$ | 12,543,694 | \$ | 11,397,778 | \$ | 11,365,926 | \$ | 13,857,203 | \$ | 11,365,926 | | | |
| Wheatridge | \$ | - | \$ | - | \$ | - | \$ | - | \$ | (2,910,467) | | | |
| Generic Wind Resource Oregon 2025 | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - | | | |
| Generic Wind Resource Montana 2025 | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - | | | |
| Total Incremental Cost | \$ | 55,060,228 | \$ | 53,957,639 | \$ | 74,730,312 | \$ | 56,373,737 | \$ | 58,343,972 | | | |

| Case 2 (HighGas-RefCO2) | , | | | 2024 | 2025 | | | 2026 | 2027 | | |
|------------------------------------|----|------------|----|------------|------|------------|----|------------|------|-------------|--|
| Unbundled RECS | | | | · | | | | | | | |
| Biglow Canyon I | \$ | 10,416,369 | \$ | 10,416,369 | \$ | 20,855,276 | \$ | 10,416,369 | \$ | 10,416,369 | |
| Biglow Canyon II | \$ | 8,291,888 | \$ | 8,291,888 | \$ | 16,601,036 | \$ | 8,291,888 | \$ | 14,693,015 | |
| Biglow Canyon III | \$ | 20,268,012 | \$ | 20,308,456 | \$ | 20,268,012 | \$ | 20,268,012 | \$ | 20,268,012 | |
| Tucannon River | \$ | 6,287,619 | \$ | 5,713,220 | \$ | 5,697,254 | \$ | 6,946,025 | \$ | 5,697,254 | |
| Wheatridge | \$ | - | \$ | - | \$ | - | \$ | - | \$ | (7,756,513) | |
| Generic Wind Resource Oregon 2025 | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - | |
| Generic Wind Resource Montana 2025 | \$ | - | \$ | - | \$ | - | \$ | - | \$ | - | |
| Total Incremental Cost | \$ | 45,263,888 | \$ | 44,729,933 | \$ | 63,421,578 | \$ | 45,922,294 | \$ | 43,318,138 | |

| Case 3 (LowGas-RefCO2) | 2023 | | 2024 | 2025 | 2026 | 2027 |
|------------------------------------|------|------------|------------------|------------------|------------------|-------------------|
| Unbundled RECS | | | | | | |
| Biglow Canyon I | \$ | 11,181,328 | \$ 11,181,328 | \$ 22,386,849 | \$ 11,181,328 | \$ 11,181,328 |
| Biglow Canyon II | \$ | 9,334,980 | \$ 9,334,980 | \$ 18,689,392 | \$ 9,334,980 | \$ 16,541,349 |
| Biglow Canyon III | \$ | 21,594,623 | \$ 21,637,715 | \$ 21,594,623 | \$ 21,594,623 | \$ 21,594,623 |
| Tucannon River | \$ | 12,655,238 | \$ 11,499,131 | \$ 11,466,997 | \$ 13,980,427 | \$ 11,466,997 |
| Wheatridge | \$ | - | \$ - | \$ - | \$ - | \$ (1,946,106) |
| Generic Wind Resource Oregon 2025 | \$ | - | \$ - | \$ - | \$ - | \$ - |
| Generic Wind Resource Montana 2025 | \$ | - | \$ - | \$ - | \$ - | \$ - |
| Total Incremental Cost | \$ | 54,766,169 | \$ 53,653,154 | \$ 74,137,860 | \$ 56,091,358 | \$ 58,838,191 |

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 2216 - PGE 2022 RPIP Incremental Cost for RECs Generated

| Base Case (RefGas-RefCO2) | 2023 | 2024 | 2025 | 2026 | 2027 |
|------------------------------------|------------------|------------------|------------------|------------------|------------------|
| Biglow Canyon I | \$ 11,254,116 | \$ 11,278,466 | \$ 11,254,116 | \$ 11,254,116 | \$ 11,254,116 |
| Biglow Canyon II | \$ 9,549,508 | \$ 9,569,386 | \$ 9,549,508 | \$ 9,549,508 | \$ 9,549,508 |
| Biglow Canyon III | \$ 21,712,910 | \$ 21,756,238 | \$ 21,712,910 | \$ 21,712,910 | \$ 21,712,910 |
| Tucannon River | \$ 11,365,926 | \$ 11,397,778 | \$ 11,365,926 | \$ 11,365,926 | \$ 11,365,926 |
| Wheatridge | - | - | - | - | - |
| Generic Wind Resource Oregon 2025 | - | - | - | - | - |
| Generic Wind Resource Montana 2025 | - | - | | - | - |
| Total Incremental Cost | 53,882,460 | 54,001,867 | 53,882,460 | 53,882,460 | 53,882,460 |

| Case 2 (HighGas-RefCO2) | 2023 | 2024 | 2025 | 2026 | 2027 |
|------------------------------------|------------------|------------------|------------------|------------------|------------------|
| Unbundled RECS | | | | | |
| Biglow Canyon I | \$ 10,416,369 | \$ 10,438,906 | \$ 10,416,369 | \$ 10,416,369 | \$ 10,416,369 |
| Biglow Canyon II | \$ 8,291,888 | \$ 8,309,148 | \$ 8,291,888 | \$ 8,291,888 | \$ 8,291,888 |
| Biglow Canyon III | \$ 20,268,012 | \$ 20,308,456 | \$ 20,268,012 | \$ 20,268,012 | \$ 20,268,012 |
| Tucannon River | \$ 5,697,254 | \$ 5,713,220 | \$ 5,697,254 | \$ 5,697,254 | \$ 5,697,254 |
| Wheatridge | \$ - | \$ - | \$ - | \$ - | \$ - |
| Generic Wind Resource Oregon 2025 | \$ - | \$ - | \$ - | \$ - | \$ - |
| Generic Wind Resource Montana 2025 | \$ - | \$ - | \$ - | \$ - | \$ - |
| Total Incremental Cost | \$ 44,673,523 | \$ 44,769,731 | \$ 44,673,523 | \$ 44,673,523 | \$ 44,673,523 |

| Case 3 (LowGas-RefCO2) | 2023 | 2024 | | 2025 | | 2026 | | 2027 |
|------------------------------------|------------------|------------------|----|------------|----|------------|----|------------|
| Unbundled RECS | | | | | | | | |
| Biglow Canyon I | \$ 11,181,328 | \$ 11,205,521 | \$ | 11,181,328 | \$ | 11,181,328 | \$ | 11,181,328 |
| Biglow Canyon II | \$ 9,334,980 | \$ 9,354,412 | \$ | 9,334,980 | \$ | 9,334,980 | \$ | 9,334,980 |
| Biglow Canyon III | \$ 21,594,623 | \$ 21,637,715 | \$ | 21,594,623 | \$ | 21,594,623 | \$ | 21,594,623 |
| Tucannon River | \$ 11,466,997 | \$ 11,499,131 | \$ | 11,466,997 | \$ | 11,466,997 | \$ | 11,466,997 |
| Wheatridge | \$ - | \$ - | \$ | - | \$ | - | \$ | - |
| Generic Wind Resource Oregon 2025 | \$ - | \$ - | \$ | - | \$ | - | \$ | - |
| Generic Wind Resource Montana 2025 | \$ - | \$ - | \$ | ÷ | \$ | ÷ | \$ | - |
| Total Incremental Cost | \$ 53,577,928 | \$ 53,696,778 | \$ | 53,577,928 | \$ | 53,577,928 | \$ | 53,577,928 |

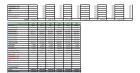
Notes

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 2020 Renewable Portolio Standard Implementation Plan Attachment A Page 2

| Park 1 - Bernal Park 1 | | | | | | _ | | _ | | | | |
|--|---|----|---|--------|------|---|------|------|-----|----|----|---|
| Marine I | | | | 100 | | | | | ı | ľ | | _ |
| | Ш | Ш | | Ш | | Ш | | Ш | | I | | |
| _ | Ē | Ē | Ē | Ē | Ē | Ē | Ē | Ē | Ē | Ē | É | Ę |
| | Ħ | Ш | | | Ë | Ħ | | Ш | | ▦ | Ē | Ē |
| | Ē | Ē | Ē | Ĕ | Ē | Ē | Ē | Ē | Ē | Ħ | Ē | Ē |
| | | 1 | | Ш | | | | Н | | Ш | | Ш |
| | E | Ħ | Ħ | Ħ | Ħ | Ħ | E | Ħ | | Ħ | E | E |
| | Н | Ш | Н | Ш | Н | Ш | Н | Ш | Н | Ш | | |
| | E | É | É | É | É | É | E | É | É | É | ΕĪ | É |
| | Ë | Ē | Н | Ħ | É | Ē | Ē | Ē | Н | Ē | F | |
| District San | | Ш | | | | Ш | | Ш | | Ш | | Ш |
| - | Ē | E | E | E | E | E | Ē | E | E | E | E | E |
| - | Ш | Ш | | Ш | | Ш | | Ш | | Ш | | |
| THE REAL PROPERTY. | Н | Ш | Н | Ш | Н | Ш | Н | Ш | Н | Ш | | Н |
| Name of Street | Н | Ш | Н | Ш | Н | Ш | Ш | Ш | Н | Ш | Н | Ш |
| Santa | | Ш | | Ш | | Ш | | Ш | | Ш | | |
| | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | | Е |
| | Ш | Ш | Н | Ш | Н | Ш | Ш | Ш | Н | Ш | | |
| | Н | Ш | Н | Ш | Н | Ш | Н | Ш | Н | Ш | | |
| CO. | Н | Ш | Н | Ш | Н | Ш | Н | Ш | Н | Ш | | Т |
| | | Ш | | Ш | | Ш | | Ш | | Ш | | Ш |
| NAME OF TAXABLE PARTY. | H | Ш | H | Ш | Η | Ш | Н | Н | Н | Т | | Η |
| | | Ш | | Ш | | Ш | | Ш | H | Ш | | Ш |
| | | Ш | Ш | Ш | Ш | Ш | ľ | Ш | Ш | Ш | | |
| | | Ш | | Ш | | Ш | | Ш | | Ш | | |
| - | | Ш | | Ш | | Ш | | Ш | | Ш | | |
| | Н | Ш | Н | Ш | Н | Ш | Н | Ш | Н | Ш | | Т |
| | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | - | Е |
| | Ш | Ш | | Ш | | Ш | Ш | Ш | Н | Ш | | Е |
| | Ē | Ë | Ë | Ē | Ë | Ë | Ē | Ē | Ë | Ë | Ē | E |
| | Ë | E | Ë | E | Ë | E | Ë | E | Ë | E | E | E |
| - | Ē | | Ë | Ē | Ë | | Ē | | Ë | | Ē | E |
| | Ë | E | Ë | E | Ë | E | Ë | E | Ë | E | E | E |
| | Ē | E | E | Ē | E | E | Ē | | E | | E | E |
| | E | É | É | Ш | É | É | E | É | | É | F | É |
| Personal Per | E | Ξ | Ħ | Ξ | Ħ | Ξ | E | Ξ | 50 | Ξ | - | F |
| | E | ▤ | Ħ | ▤ | Ħ | ▤ | E | ▤ | Ē | ▤ | E | E |
| | Ħ | Ħ | | 411111 | Ë | Ħ | 1761 | Ħ | | Ĭ | E | |
| 2 | E | Ш | Ē | Ĕ | | Ĕ | | | Ē | Ĕ | | É |
| | Ē | Ħ | Ħ | ø | Ħ | Ħ | Ē | Ħ | Ħ | Ĭ | E | Ē |
| | Ē | Ē | Ħ | Ē | Ħ | Ē | Ē | Ē | Ħ | Ē | E | É |
| ΕĒ | Ē | É | Ē | Ē | Ē | É | Ē | É | Ē | Ē | E | É |
| | | Ε | Ħ | Ħ | E | Ε | | Ε | 100 | Ε | E | Ħ |
| | Н | Ш | Н | Ш | Н | Ш | Н | Ш | Ш | Ш | | |
| | E | Ħ | E | Ħ | E | Ħ | E | Ħ | E | Ħ | E | F |
| | E | ▤ | ▤ | ø | ▤ | ▤ | E | ▤ | ▤ | ▤ | E | E |
| | Ē | Ħ | Ē | Ē | Ē | Ħ | Ē | Ħ | Ē | Ħ | E | Ē |
| | Ē | Ē | Ē | ø | Ē | Ē | Ē | Ē | Ē | Ē | E | |
| | E | ▤ | | = | Ħ | ▤ | E | ▤ | | ▤ | E | E |
| altered to | I | Ш | Ш | Ш | I | Ш | Н | Ш | Н | Ш | | Ε |
| | | Ш | | Ш | | Ш | | Ш | | Ш | | Ш |
| | I | Ш | Ш | Ш | Н | Ш | Н | Ш | | Ш | | |
| La Carlo Carlo | | Ш | | Ш | | Ш | | 1111 | | Ш | | Ш |
| Name of Street | | Ш | | Ш | | Ш | | Н | | Ш | | |
| mark. | Н | Ш | | Ш | | Ш | | Ш | 275 | Ш | | Ш |
| | | Ш | | Ш | | Ш | | Ш | - | Ш | | Ξ |
| | Н | Ш | Н | Ш | Н | Ш | Н | Ш | | Ш | | Ε |
| | | Н | | Ш | | Н | | Н | | Н | | Ε |
| | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | | |
| | | Н | | Ш | | Н | | Н | | Н | | Ε |
| | Ш | Ш | | Ш | | Ш | Ш | Ш | | Ш | | |
| Tomorbo associate | Н | Н | Н | Ш | Н | Н | Н | я | 200 | Т | | П |
| | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | | |
| Service Service | Ш | Ш | Ш | Ш | Ш | Ш | Ш | Ш | ı | Ш | | Ш |
| - | | Ш | | Ш | | Ш | | Ш | | Ш | | Ξ |
| | Н | Ш | Ш | | | Ш | Н | Ш | | Ш | | |
| | Ē | Ē | | ø | Ē | Ē | | Ē | Ē | Ē | | |
| | | Ш | | Ш | | Ш | | Ш | | Ш | | Ш |
| 200 | I | Ш | I | I | I | Ш | I | W | I | Ш | | Ш |
| | | Ш | | = | | Ш | | Ш | | Ш | | |
| - | | Ш | | Ш | | Ш | | Ш | | Ш | | |
| CONTRACTOR OF THE PARTY OF THE | Н | Ш | Н | Ш | Н | Ш | | H | Н | Т | | |
| | Н | Ш | | Ш | | Ш | Ш | Ш | | Ш | | |
| September 1 | Н | Ш | Н | Н | Н | Ш | Н | Н | Н | П | | П |
| | | Ш | | Ш | | Ш | | Ш | | Ш | | Ш |
| Auto Series | I | Ш | Ш | Ш | I | Ш | Н | Ш | I | Ш | | Ε |
| 2 | | Ш | | | | Ш | | Ш | | Ш | | |
| | | Ш | | Ш | | Ш | | Ш | | Ш | | Ш |
| | Ē | Ħ | | Ē | | Ħ | | Ħ | Ë | | | E |
| ⋿ | E | É | | | | É | | É | | Ĕ | | |
| | Ħ | Ē | Ē | ø | Ē | Ē | Ē | Ē | Ē | Ē | E | Ē |
| | E | Ξ | Ħ | Ξ | Ħ | ▤ | E | Ξ | Ħ | Ξ | E | E |
| | E | Ш | Ш | | Ш | Ш | | Ш | Ш | Ш | E | |
| | Ē | Ē | Ē | ø | Ē | Ē | Ē | Ē | | - | | F |
| | Ħ | Ē | Ē | Ħ | Ē | Ħ | Ξ | | l | ľì | | |
| | | E | | e | | | | Ш | | Ш | | |
| | | -= | Ë | _= | _= | Ш | Ш | Ш | | | | |
| | ⋿ | Ľ | | Е | | | | | | | | |
| | | Ш | Ш | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| AND THE STATE OF T | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | |
| Marriero de Carte de | 10000 | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | |
| | 100 | | | | | | | | | | | |
| | 33 33 33 33 33 33 33 33 33 33 33 33 33 | | | | | | | | | | | |
| | 1000 | | | | | | | | | | | |
| | 1000 1000 1000 1000 1000 1000 1000 100 | | | | | | | | | | | |
| | 1920 | | | | | | | | | | | |
| | 1000 1000 1000 1000 1000 1000 1000 100 | | | | | | | | | | | |
| | 1400 1400 1400 1400 1400 1400 1400 1400 | | | | | | | | | | | |
| | 100 | | | | | | | | | | | |
| | 1000 | | | | | | | | | | | |
| | 3000 | | 100 | | | | | | | | | |
| | 1000 | | | | 2015 | | | | | | | |
| | 1200 | | 100 | | | | | | | | | |
| | | | 100 | | | | | | | | | |
| | | | 100 | | | | | | | | | |
| | | | 100 | | | | | | | | | |
| | 1000 | | 100 | | | | | | | | | |
| | 1000 | | 2000 2000 2000 2000 2000 2000 2000 200 | | | | | | | | | |
| | | | 100 | | | | | | | | | |
| | | | 2000 2000 2000 2000 2000 2000 2000 200 | | | | | | | | | |
| | | | 2000 2000 2000 2000 2000 2000 2000 200 | | | | | | | | | |
| | | | 2000 2000 2000 2000 2000 2000 2000 200 | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | 4044 | | | | | |
| | | | | | | | 4044 | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | 4044 | | | | | |
| | | | | | | | 4044 | | | | | |
| | | | | | | | 4044 | | | | | |
| | | | | | | | 4044 | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | 4044 | | | | | |



| Tah | 5 - | RFCs | Gen | erated |
|-----|-------|-------|------|--------|
| Iau | . J - | 11603 | OCII | cialcu |

| | тар | 5 - REUS | <u>senerated</u> | | Five-Year | | | | | | | | | | | | | |
|---|---|---|---|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|
| | 2022 | 2022 | 2024 | 2025 | 2026 | 2027 | | | | | | | | | | | | |
| Resource Low Impact Hydro | 2022 442,758 | 2023 442,758 | 2024 443,970 | 2025 442,758 | 2026 442,758 | 2027 442,758 | | | | | | | | | | | | |
| Biogas Cogen | 442,736 | 442,736 | 443,970 | 442,736 | 442,736 | 442,736 | | | | | | | | | | | | |
| Biglow Canyon I | 222.405 | 322,495 | 222 102 | 222.405 | 222.405 | 222.405 | | | | | | | | | | | | |
| Biglow Canyon II | 322,495 | | 323,193 | 322,495 | 322,495 394,856 | 322,495 | | | | | | | | | | | | |
| Biglow Canyon III | 394,856 | 394,856 | 395,678 | 394,856 | | 394,856 | | | | | | | | | | | | |
| Tucannon River | 348,797 | 348,797 | 349,493 | 348,797 | 348,797 | 348,797 | | | | | | | | | | | | |
| Vansycle Ridge | 826,422 | 826,422 | 828,738 | 826,422 | 826,422 | 826,422 | | | | | | | | | | | | |
| PPM Klondike II | 67,072 | 67,072 | 67,272 | 67,072 | 67,072 | 67,072 | | | | | | | | | | | | |
| Hydro Upgrades | 208,087 | 208,087 | 208,515 | 208,087 | 208,087 | 208,087 | | | | | | | | | | | | |
| enXco Solar | 142,078 | 142,078 | 142,468 | 142,078 | 142,078 | 142,078 | | | | | | | | | | | | |
| SPO Solar | 5,564 | 5,520 | 5,485 | 5,432 | 5,389 | 5,346 | | | | | | | | | | | | |
| | 18,497 | 18,385 | 18,305 | 18,165 | 18,057 | 17,949 | | | | | | | | | | | | |
| Outback Solar | 5,455 | 5,434 | 5,423 | 5,394 | 5,373 | 5,353 | | | | | | | | | | | | |
| Qualifying Facilities | 587,968 | 679,458 | 688,065 | 1,123,471 | 1,080,880 | 1,123,966 | | | | | | | | | | | | |
| ETO and Other Solar | 32,710 | 32,710 | 32,800 | 32,710 | 41,470 | 50,230 | | | | | | | | | | | | |
| Wheatridge | - | - | - | - | - | - | | | | | | | | | | | | |
| 2025 Addition - OR | - | - | - | - | - | - | | | | | | | | | | | | |
| 2025 Addition - MT | - | - | - | - | - | - | | | | | | | | | | | | |
| Null | - | - | - | - | - | - | | | | | | | | | | | | |
| Null | - | - | - | - | - | - | | | | | | | | | | | | |
| Null | - | - | - | - | - | - | | | | | | | | | | | | |
| Purchased Bundled | - | - | - | - | - | - | | | | | | | | | | | | |
| Unbundled RECs | - | - | - | - | - | - | | | | | | | | | | | | |
| Total RECs | 3,402,760 | 3,494,074 | 3,509,405 | 3,937,737 | 3,903,735 | 3,955,410 | | | | | | | | | | | | |
| RECs Available Less LIH | 2,960,002 | 3,051,315 | 3,065,435 | 3,494,979 | 3,460,977 | 3,512,652 | | | | | | | | | | | | |
| Infinite | | | | | | | | | | | | | | | | | | |
| Infinite Resource | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | | | | | | | | | | | | |
| Resource Low Impact Hydro | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen | 2022 - - | 2023 | | 2025 | 2026 | 2027 - - | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen Biglow Canyon I | 2022 - - - | 2023 | - | 2025 | 2026 - - - | 2027 - - - | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen Biglow Canyon I Biglow Canyon II | 2022 - - - - | - | - | 2025 | 2026 - - - - | 2027 | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen Biglow Canyon I | - - - | - - - | - | - - - | - - - | 2027 - - - - - | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen Biglow Canyon I Biglow Canyon II Biglow Canyon III Tucannon River | - - - | - - - | - | - - - | - - - | 2027 - - - - - | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen Biglow Canyon I Biglow Canyon II Biglow Canyon III Tucannon River Vansycle Ridge | - - - | - - - - | - | - - - | - - - | 2027 | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen Biglow Canyon I Biglow Canyon II Biglow Canyon III Tucannon River Vansycle Ridge PPM Klondike II | - - - | - - - - | - - - - - | - - - | - - - | 2027 - - - - - - - | | | | | | | | | | | | |
| Resource Low Impact Hydro Biogas Cogen Biglow Canyon I Biglow Canyon II Biglow Canyon III Tucannon River Vansycle Ridge PPM Klondike II Hydro Upgrades | - - - | - - - - - - | - - - - - - | - - - | - - - | 2027 - - - - - - - - | | | | | | | | | | | | |
| Resource 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 | - - - - - - | - - - - - - | - - - - - - | - - - - - - | - - - | - - - - - - - | | | | | | | | | | | | |
| Resource 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 | - - - - - - - | - - - - - - - | - - - - - - - | - - - - - - - | - - - - - - | - - - - - - - | | | | | | | | | | | | |
| Resource 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 | - - - - - - - | - - - - - - - | - - - - - - - - | - - - - - - - - | - - - - - - - - | - - - - - - - - | | | | | | | | | | | | |
| Resource 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 | - - - - - - - - - | - - - - - - - - | - - - - - - - - - | - - - - - - - - | - - - - - - - - | - - - - - - - - - - | | | | | | | | | | | | |
| Resource 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 | - - - - - - - - - | - - - - - - - - - | - - - - - - - - - | - - - - - - - - - | - - - - - - - - - | - - - - - - - - - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge | - - - - - - - - - - | - - - - - - - - - - | - - - - - - - - - - | - - - - - - - - - | - - - - - - - - - | - - - - - - - - - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar | - - - - - - - - - - - | - - - - - - - - - - - | - - - - - - - - - - - | - - - - - - - - - 33,200 | - - - - - - - - - 32,422 | - - - - - - - - - - - - - - - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge | - - - - - - - - - - - - | - - - - - - - - - - - - | - - - - - - - - - - - - - | - - - - - - - - - 33,200 | - - - - - - - - - 32,422 - 1,038,145 | - - - - - - - - - - - - - - - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge 2025 Addition - OR | - - - - - - - - - - - - - | - - - - - - - - - - - - - | - - - - - - - - - - - - - | - - - - - - - - 33,200 - 1,038,862 | - - - - - - - - - 32,422 - 1,038,145 | - - - - - - - - - - 6,065 - 1,037,440 | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge 2025 Addition - OR 2025 Addition - MT | - - - - - - - - - - - - - | - - - - - - - - - - - - - | - - - - - - - - - - - - - - | - - - - - - - - 33,200 - 1,038,862 - - | - - - - - - - - - 32,422 - 1,038,145 | - - - - - - - - - - 6,065 - 1,037,440 | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge 2025 Addition - OR 2025 Addition - MT Null | - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - | - - - - - - - - 33,200 - 1,038,862 - - | - - - - - - - - 32,422 - 1,038,145 - - | - - - - - - - - - 6,065 - 1,037,440 - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge 2025 Addition - OR 2025 Addition - MT Null Null | - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - 33,200 - 1,038,862 - - - | - - - - - - - - 32,422 - 1,038,145 - - | - - - - - - - - - 6,065 - 1,037,440 - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge 2025 Addition - OR 2025 Addition - MT Null Null Null Purchased Bundled Unbundled RECs | - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - 33,200 - 1,038,862 - - - | - - - - - - - - 32,422 - 1,038,145 - - | - - - - - - - - - 6,065 - 1,037,440 - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge 2025 Addition - OR 2025 Addition - MT Null Null Purchased Bundled | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - 33,200 - 1,038,862 - - - | - - - - - - - - 32,422 - 1,038,145 - - | - - - - - - - - - 6,065 - 1,037,440 - - | | | | | | | | | | | | |
| Resource 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 ETO and Other Solar Wheatridge 2025 Addition - OR 2025 Addition - MT Null Null Null Purchased Bundled Unbundled RECs | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - 33,200 - 1,038,862 - - - - | - - - - - - - - 32,422 - 1,038,145 - - - - | - - - - - - - - - 6,065 - 1,037,440 - - - | | | | | | | | | | | | |

| Compliance Year | 2 | 122 | 21 | 122 | 2 | 224 | 2 | 325 | 20 | 26 | 20 | 27 |
|--------------------|-----------|---------|-----------|--------|-----------|---------|-----------|---------|-----------|---------|------------|---------|
| REC Form | 9995 | Vintage | MW | Votage | 3005 | Virtage | 3015 | Virtige | 5515 | Virtige | Mars. | Virtige |
| Banked RECs | | 2007 | | 2007 | | 2007 | | 2007 | | 2007 | , | 2007 |
| | | 2008 | | 2008 | | 2008 | | 2008 | | 2008 | | 2008 |
| | | 2009 | | 2009 | | 2009 | | 2009 | | 2009 | | 2009 |
| | | 2010 | | 2010 | | 2010 | | 2010 | 34,996 | 2010 | | 2010 |
| | | 2011 | | 2011 | | 2011 | 2.549 | 2011 | 272.941 | 2011 | 136 036 | 2011 |
| | | 2012 | | 2012 | | 2012 | 2.531 | 2012 | 250,290 | 2012 | 207.206 | 2012 |
| | | 2013 | | 2013 | | 2013 | 2,909 | 2013 | 171.460 | 2013 | 210.810 | 2013 |
| | | 2014 | | 2016 | | 2014 | 2.931 | 2014 | 184.961 | 2014 | 222 962 | 2014 |
| | | 2015 | | 2015 | | 2015 | 3.199 | 2015 | 267.005 | 2015 | 201.419 | 2015 |
| | | 2019 | | 2019 | | 2016 | | 2016 | 129.996 | 2016 | 13.668 | 2016 |
| | | 2017 | | 2017 | | 2017 | | 2017 | | 2017 | | 2017 |
| | | 2018 | | 2018 | | 2018 | | 2018 | | 2018 | | 2016 |
| | | 2019 | | 2019 | | 2019 | | 2019 | | 2019 | | 2019 |
| | | 2000 | | 2020 | | 2020 | | 2020 | | 2020 | | 2020 |
| | 2,126,229 | 2021 | | 2021 | | 2021 | | 2021 | | 2021 | | 2021 |
| | 1,565,062 | 2022 | 1,837,709 | 2022 | | 2022 | | 2022 | | 2022 | | 2022 |
| | | 2023 | 1.919.031 | 2023 | 1.575.042 | 2023 | | 2023 | | 2023 | | 2023 |
| | | 2024 | | 2024 | 2.242.559 | 2024 | 1.267.047 | 2024 | | 2024 | | 2024 |
| | | 2025 | - | 2025 | - | 2025 | 3,937,737 | 2025 | 33,200 | 2025 | 395,067 | 2025 |
| | | 2026 | | 2026 | | 2026 | | 2026 | 3,936,157 | 2026 | , | 2026 |
| | | 2027 | | 2027 | | 2027 | | 2027 | | 2027 | 3,961,475 | 2027 |
| Total Bundled RECs | 2.691.290 | | 2.756.762 | | 3.917.400 | | 5.219.800 | | 5.279.796 | | \$ 338.603 | |
| | | | | | | | | | | | | |
| Unbunded RECs | ١ | | | | | | | | | | | |
| 9 | | | | | | | | | - | | | |
| Total RECs + ACP | 3 694 595 | | 9 766 749 | | 3.017.485 | | 5 949 865 | | 6 979 766 | | 6 910 601 | |
| | | | | | | | | | | | | |
| Total Need | 9 694 995 | | 9766749 | | 3.017.455 | | 5 949 865 | | 6 979 766 | | 6 910 601 | |
| | | | | | | | | | | | | |

Incremental Cost by Resource No Unbundled RECs

| | | | Expec | ted Incremental Cost of Qua | lifying Electricity | | |
|------------------------------------|-----------|----------|----------|-----------------------------|---------------------|-----------|-----------|
| | | \$/MWh | | | | \$000's | |
| | Base Case | Case 3 | Case 5 | 2023 | Base Case | Case 3 | Case 5 |
| | | | | Busbar | | | |
| | RefGas- | HighGas- | LoGas- | Energy | RefGas- | HighGas- | LoGas- |
| | RefCO2 | RefCO2 | RefCO2 | (MWh) | RefCO2 | RefCO2 | RefCO2 |
| Staged Build | | | | | | | |
| Biglow Canyon I | 34.897 | 32.299 | 34.671 | 322,495 | \$ 11,254 | \$ 10,416 | \$ 11,181 |
| Biglow Canyon II | 24.185 | 21.000 | 23.641 | 394,856 | \$ 9,550 | \$ 8,292 | \$ 9,335 |
| Biglow Canyon III | 62.251 | 58.108 | 61.912 | 348,797 | \$ 21,713 | \$ 20,268 | \$ 21,595 |
| Tucannon River | 13.753 | 6.894 | 13.875 | 826,422 | \$ 11,366 | \$ 5,697 | \$ 11,467 |
| Wheatridge | (7.558) | (20.142) | (5.054) | 0 | \$ - | \$ - | \$ - |
| Generic Wind Resource Oregon 2025 | (13.935) | (31.638) | (9.801) | 0 | \$ - | \$ - | \$ - |
| Generic Wind Resource Montana 2025 | (16.903) | (34.606) | (12.770) | 0 | \$ - | \$ - | \$ - |