Portland General Electric
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March 18, 2024

Public Utility Commission of Oregon
Attn: Filing Center
201 High Street, S.E.
P.O. Box 1088
Salem, OR 97308-1088

RE: UM 1728 PGE Application to Update Schedule 201 Qualifying Facility Information

Pursuant to Oregon Administrative Rule (OAR) 860-029-0085, Oregon Revised Statute (ORS) 758.525, and the March 11, 2024, Administrative Law Judge (ALJ) Ruling in this proceeding,[1] Portland General Electric Company (PGE) submits this filing to revise its Schedule 201, Qualifying Facility Avoided Cost Power Purchase Information for Qualifying Facilities (QFs) 10 MW or Less, Sheet Nos. 201-1 through 201-31.

On March 31 2023, PGE filed its 2023 IRP in LC 80. The Public Utility Commission of Oregon's (Commission or OPUC) review of the IRP update allowed for a robust public process in which key stakeholders participated. Stakeholders filed comments and PGE responded to numerous data requests. On January 25, 2024, the Commission acknowledged PGE's 2023 IRP at the special public meeting. PGE respectfully requests in this filing incorporating information from PGE's IRP to update avoided cost prices, with an effective date of **April 17, 2024**. In Order No. 14-058, the Commission directed electric utilities to update their avoided cost prices on May 1 every year, Pursuant to OAR 860-029-0085(4)(a), the annual update is limited to four factors:

1. Updated natural gas prices;
2. On- and off-peak forward-looking electricity market prices;
3. Changes to the status of the Production Tax Credit (PTC); and
4. Any other action or change in an acknowledged Integrated Resource Plan (IRP) update relevant to the calculation of avoided costs.

PGE seeks a waiver to of OAR 860-029-0085(4)(a) to file a May 1 update due to this filing being so near May 1 and because an updated May 1 filing would only be limited to the first two factors.

[1] On February 14, 2024, PGE filed an application for waiver of OAR 860-029-0040(4) to allow time for the Company to comply with OPUC Staff's recommendation 9 in the LC 80 docket, which was adopted by the Commission and affects the development of standard rates for qualifying facilities. Staff's recommendation 9 directed PGE to recalculate its IRP inputs using an assumption of 75 percent for QF renewals and the QF success rate for Schedule 202 projects. PGE requested in its waiver application to file these rates no later than March 15, 2024. On February 20, 2024, OAR 860-029-0040(4) was temporarily waived. On March 8, 2024, Staff requested that the waiver be extended to March 18, 2024, so that the rates can be effective on a timeline that allows the PUC flexibility to bring PGE's filing to the Commission at the April 16, 2024 regular public meeting instead of the April 2, 2024 regular public meeting. On March 11, 2024, the Chief Administrative Law Judge granted Staff's request and OAR 860-029-0040(4) was temporarily waived until March 18, 2024.

In 2021, the Oregon Legislature passed House Bill 2021 which mandates goals for decarbonization and requires Utilities to reduce greenhouse gas emissions associated with electricity sold to Oregon consumers by 80 percent below baseline emission levels by 2030 and 100 percent below baseline emissions levels by 2040. Due to this landmark public policy mandate, PGE is proactively updating the renewable capacity proxy resource from a generic Simple-Cycle Combustion Turbine (SCCT) to a 4-Hour Battery. PGE understands that the Commission opened UM 2000 to review issues such as the methodology of setting avoided cost prices, and therefore PGE is only making this single change in light of HB 2021 and looks forward to discussing these issues holistically in UM 2000. PGE reserves flexibility to propose methodologies in UM 2000 that differ from the methodology and calculations used in this filing including the incorporation of capacity resources in the avoided cost modeling and methodology.

Additionally, this filing provides updated prices to for the Standard and Renewable interim Solar plus Storage-Avoided cost prices that were adopted by the Commission on September 21, 2023.

To align with the Capacity Contribution Best Practices adopted by the Commission in docket UM 2011, Order No. 22-468, PGE has also updated the capacity contribution values for proxy resources to 'tuned' ELCC values. Additionally, the ELCC values were updated to align with Staff's recommendation 9 in docket no. LC 80 which directed PGE to recalculate its IRP inputs using an assumption of 75 percent for QF renewals and the QF success rate for Schedule 202 projects. PGE updated base, wind, solar and solar + storage energy and capacity values using 2026 tuned values.

The major drivers for the changes to PGE's Schedule 201 prices[2] are as follows:

- **Updated Deficiency/Sufficiency Periods.** The Deficiency/Sufficiency periods have been updated based on the 2023 IRP. The Sufficiency Period is the period from the current year through 2025. The Deficiency Period begins in 2026.
- **Updated Natural Gas Prices.** For both Standard and Renewable Avoided Costs, forward natural gas prices have increased.
- **On- and off-peak forward-looking electricity market prices**. For both Standard and Renewable Avoided Costs, forward electricity prices have decreased during the sufficiency period.
- **Updated Effective Load Carrying Capability (ELCC) Values.** The ELCC values were updated to align with Staff's recommendation 9 in Docket No. LC 80 which directed PGE to recalculate its IRP inputs using an assumption of 75 percent for QF renewals and the QF success rate for Schedule 202 projects. The largest change was the increase in the solar ELCC.
- **Updated Proxy Capacity Resource.** PGE is updating the capacity proxy resource from a SCCT to a 4-Hour Battery, resulting in higher capacity values and lower energy values.[3]
- **Updated SCCT, CCCT and Gorge Wind Overnight Capital and Fixed O&M.** Both

[2] The status of the federal PTC did not change and is not included as an update.
[3] Capacity and energy values are negatively correlated because of how energy values are calculated in this model. As capacity values increase, base load energy values decrease at 1 to 1 ratio, holding all other values constant.

costs increased for SCCT and CCCT resulting in higher non-renewable energy costs. Both costs decreased for Gorge Wind resulting in lower renewable energy values.

- **Updated Gorge Wind Capacity Factor.** This value increased resulting lower wind capacity values.
- **Updated Solar and Wind Integration Costs.** These values increased resulting in lower renewable wind, solar and solar + storage energy values.
- **Updated Combined-Cycle Combustion Turbine (CCCT) Annual Generation and Starts.** This filing includes updated values for the CCCT annual starts and generation based on the dispatch from the 2023 IRP Update modeling. This update impacts non-renewable avoided cost prices only.

The changes discussed above result in non-renewable avoided cost prices for Base Load and Wind slightly higher than the renewable avoided cost prices for the same resources. This is largely due to a lower wind overnight cost of capital and fixed O&M in the 2023 IRP compared to the previous wind overnight capital and fixed O&M cost from the 2019 IRP update. Additionally, CCCT overnight cost of capital and fixed O&M increased in the 2023 IRP compared to the 2019 update. These changes drive renewable energy values down and nonrenewable energy values up.

For the reasons discussed above, the inputs included in this avoided cost update are reasonable and consistent with OAR 860-029-0085.

Attachment A provides a redacted description of standard avoided costs. The confidential Attachment A is subject to Protective Order 17-321 and will be sent separately to the Filing Center password protected.

Attachment B provides a description of renewable avoided costs.

Attachment C provides a comparison of inputs to those used in PGE's current avoided costs.

Please direct any questions regarding this filing to Chris Pleasant at the following email address Christopher.pleasanat@pgn.com .

Please direct all formal correspondence and requests to the following email address pge.opuc.filings@pgn.com

Sincerely,

\s\ Robert Macfarlane

Robert Macfarlane
Manager, Pricing & Tariffs

Enclosures
cc: Service List – UM 1728

UM 1728

Application to Update Schedule 201
Avoided Cost Power Purchase Information

Attachment A
Description of Non-Renewable Avoided Costs

Tables S.9a and S.9b are confidential and have been redacted

PORTLAND GENERAL ELECTRIC COMPANY
NON-RENWABLE AVOIDED COST STUDY
2024 ANNUAL UPDATE

Introduction

This avoided cost update is consistent with PGE's 2023 Integrated Resource Plan (IRP). The Commission directs electric utilities to make an avoided cost filing within 30 days of IRP acknowledgement.

Integrated Resource Plan

The Commission acknowledged PGE's 2023 IRP at its January 25, 2024 special public meeting. The 2023 IRP forms the basis of most of the inputs in this avoided cost study.

Below is a summary of the changes:

Deficiency/Sufficiency Periods

The Deficiency/Sufficiency periods have been updated based on the 2023 IRP. The current Deficiency/Sufficiency periods are stated below:

- Resource Sufficiency Period is the period from the current year through 2025.
- Resource Deficiency Period is the period beginning in 2026.

Gas Price Projections

Natural gas prices are based on PGE's forward AECO price curves from January 31,2024 for January 2024 through December 2028. For 2029-2050, prices are based on the same methodology as the acknowledged 2023 IRP with the most recent long-term forecast from Wood Mackenzie (2023 H2). The 2029 prices are based on a linear interpolation from PGE's curves to the long-term forecast. For 2030 through 2050, prices align with the AECO prices from the 2023 H2 Wood Mackenzie forecast. Prices after 2051 are escalated with inflation.

The nominal average annual northwest burnertip natural gas price is forecasted to trend from $2.50/MMBtu in 2025 to $6.56/MMBtu in 2048.

The variable gas transportation costs are based on 2023 AUT variable transportation costs and loss rates.

The nominal average variable gas transportation cost is forecasted to trend from $0.05/MMBtu in 2025 to $0.19/MMBtu in 2048.

Electricity Market Projections

The forward trading curves are based on market prices for electricity delivered to PGE's system. The forward trading curves adjusted for delivery are used to price avoided costs during the resource sufficiency period. For January 2024 through December 2025 the market prices are based on PGE's forward Mid-Columbia trading curve from January 31, 2024.

The current Schedule 201 prices, wheeling costs are based on 2023 BPA rates consistent with the 2023 IRP, adjusted for inflation.

Avoided Cost Pricing Estimates

Tables 1 through 3 and 10 through 13(following) summarize the results for PGE's fixed price option. Tables 1a, 1b, 2a, 2b, 3a, and 3b[1] are estimates of monthly on- and off-peak avoided costs for energy over 20 years beginning in April 2024. Tables 10a, 10b, 11a, 11b, 12a, 12b, 13a and 13b are estimates of monthly on- and off-peak avoided costs for capacity for over 20 years beginning in January 2026. The pricing is comprised of the energy plus the capacity costs (discussed below).[2]

The sufficiency period prices (expressed in $/MWh or mills/kWh) for the years 2024 through 2025, are based on the forward electricity prices adjusted for delivery as discussed above.

The deficiency period prices begin in 2026. The on-peak prices represent both capacity and energy costs, while off-peak prices represent energy costs only. The on-peak price includes the following costs of a CCCT: fuel, variable operation and maintenance (O&M), capacity, and other fixed costs. The off-peak price includes fuel, variable O&M, and other fixed costs. The "other fixed costs" represent the energy portion of the fixed costs of a CCCT. Other fixed costs are calculated by taking the fixed costs of a CCCT minus the real levelized capital carrying cost and fixed O&M of a 4-Hour Battery. The result (other fixed costs) represents the energy portion of the fixed costs of a CCCT. On-peak periods are from 6 a.m. through 10 p.m. Mondays through Saturdays. The off-peak hours are from 10 p.m. until 6 a.m. Mondays through Saturdays and all twenty-four hours on Sunday. For the interim Solar plus Storage rate the four daily premium peak hours are daylight savings months (March–October): 6:00 PM – 10:00 PM and winter months (November–February): 5:00 AM – 7:00 AM and 7:00 PM – 9:00 PM[3] Table 4 provides integration costs avoided. Tables 4 and 5 show the projected on- and off-peak resource sufficiency period forward market prices.

[4] Table 1: Base Load QF; Table 2: Wind QF; Table 3: Solar QF, Table 4 Interim Solar plus Storage.
[2] Avoided Cost Components section.
[3] Schedule 201, Sheet 201-3.

Avoided Cost Components

Energy:

Tables 6 through 9 in the work papers show the other fixed costs, variable O&M, fuel costs, gas forecast avoided cost components (with and without transportation), and capacity.

Table 6 contains the energy portion of a CCCT, calculated using fixed costs of a CCCT minus the real levelized capital carrying cost and fixed O&M of a 4-Hour Battery.

Table 7 shows the variable O&M associated with the CCCT and Table 8 shows the projected fuel costs.

Table 9a and 9b contains the forecasted gas prices in $/MMBtu.

Tables 4, 6, 7 and 8 can be summed to equal the total on-peak avoided costs in Table 1a. Tables 5, 6, 7 and 8 can be summed to equal the total off-peak avoided costs in Table 1b.

Capacity:

The on- and off-peak 4-Hour Battery -related capacity component costs are shown in Tables 10a and 10b, 11a and 11b, 12a and 12b, 13a and 13b. Tables 10b, 11b, 12b and 13b are blank since no capacity value is calculated for the off-peak period. The capacity values are applicable only to on-peak hours.

Non-Renewable Energy Tables

Portland General Electric
Avoided Cost Study
On-Peak Energy, Base Load

Table S.1a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	252.49	89.64	73.30	70.75	57.48	72.79	149.87	208.07	158.04	82.49	97.81	139.67	
2025	143.23	121.55	85.52	66.89	56.31	58.39	143.39	184.52	149.55	92.04	102.42	119.54	110.41
2026	25.09	24.62	21.77	19.15	18.43	18.76	19.40	19.41	19.42	20.20	22.75	24.91	21.15
2027	25.87	25.52	21.91	18.80	18.04	18.33	18.94	18.98	19.05	19.81	22.25	24.37	20.97
2028	25.37	25.01	21.77	18.67	17.89	18.10	18.65	18.65	18.61	19.39	22.16	24.33	20.70
2029	23.09	22.64	21.00	19.88	19.74	19.73	20.14	20.46	20.74	21.19	21.88	22.21	21.05
2030	22.67	22.72	21.27	20.41	20.51	20.38	20.67	20.52	20.85	21.24	22.52	23.16	21.40
2031	23.34	23.34	20.59	19.97	19.82	19.70	20.23	20.33	20.29	20.60	22.67	23.53	21.19
2032	23.19	23.64	21.48	20.19	20.10	20.35	21.38	21.49	22.04	22.85	24.40	25.06	22.18
2033	25.28	24.72	24.31	23.26	22.97	23.19	23.46	23.44	24.34	24.77	25.81	27.09	24.39
2034	28.53	26.86	25.69	24.31	24.25	23.96	23.99	24.50	24.35	25.10	25.83	27.24	25.37
2035	28.48	27.58	24.98	23.81	23.72	23.77	23.91	24.02	24.21	24.90	26.52	28.18	25.33
2036	29.53	28.15	24.96	23.41	23.28	23.64	23.55	23.64	23.81	25.50	25.73	27.44	25.22
2037	28.71	27.02	22.77	21.66	21.30	21.06	21.20	21.76	21.92	23.25	23.36	25.52	23.29
2038	27.33	27.26	22.43	20.94	21.10	20.59	21.56	21.25	21.83	23.17	20.97	22.73	22.56
2039	26.03	25.26	23.59	21.38	21.24	21.10	21.10	21.35	21.71	21.67	21.73	23.39	22.45
2040	26.44	27.67	24.74	22.72	22.60	22.69	22.41	22.58	23.23	23.78	22.60	24.84	23.85
2041	29.65	29.07	25.30	23.26	22.83	22.66	23.80	24.56	25.24	23.58	25.87	28.01	25.30
2042	30.23	32.39	27.86	25.54	25.40	25.23	26.18	26.30	26.50	25.03	26.38	30.37	27.26
2043	31.00	34.25	28.19	26.20	26.06	26.01	27.14	27.26	27.48	26.40	27.12	30.52	28.11
2044	33.26	39.31	32.44	30.17	30.04	30.00	32.95	33.24	33.48	29.63	31.19	33.73	32.44
2045	36.78	43.87	37.87	35.38	35.26	35.34	36.64	37.16	37.43	33.12	36.83	39.38	37.05
2046	43.35	47.02	40.40	37.97	37.85	37.88	39.86	40.24	40.53	36.97	38.73	41.54	40.15
2047	45.53	49.74	43.88	41.32	41.21	41.25	42.66	43.10	43.41	40.43	42.92	45.84	43.40
2048	50.76	54.61	48.39	45.64	45.53	45.46	46.72	47.15	47.49	45.74	46.17	49.28	47.73
2049	53.83	58.68	51.13	48.61	48.52	48.47	49.64	50.72	51.08	48.83	50.41	53.27	51.05

Portland General Electric
Avoided Cost Study
Off-Peak Energy, Base Load

Table S.1b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	197.46	72.28	63.60	61.56	41.65	43.70	65.14	84.53	73.30	68.20	79.43	109.04	
2025	113.10	99.13	65.92	64.81	42.43	37.63	68.16	90.43	77.95	76.95	85.24	104.21	76.99
2026	25.09	24.62	21.77	19.15	18.43	18.76	19.40	19.41	19.42	20.20	22.75	24.91	21.14
2027	25.87	25.52	21.91	18.80	18.04	18.33	18.94	18.98	19.05	19.81	22.25	24.37	20.97
2028	25.37	25.01	21.77	18.67	17.89	18.10	18.65	18.65	18.61	19.39	22.16	24.33	20.72
2029	23.09	22.64	21.00	19.88	19.74	19.73	20.14	20.46	20.74	21.19	21.88	22.21	21.05
2030	22.67	22.72	21.27	20.41	20.51	20.38	20.67	20.52	20.85	21.24	22.52	23.16	21.40
2031	23.34	23.34	20.59	19.97	19.82	19.70	20.23	20.33	20.29	20.60	22.67	23.53	21.19
2032	23.19	23.64	21.48	20.19	20.10	20.35	21.38	21.49	22.04	22.85	24.40	25.06	22.17
2033	25.28	24.72	24.31	23.26	22.97	23.19	23.46	23.44	24.34	24.77	25.81	27.09	24.38
2034	28.53	26.86	25.69	24.31	24.25	23.96	23.99	24.50	24.35	25.10	25.83	27.24	25.39
2035	28.48	27.58	24.98	23.81	23.72	23.77	23.91	24.02	24.21	24.90	26.52	28.18	25.33
2036	29.53	28.15	24.96	23.41	23.28	23.64	23.55	23.64	23.81	25.50	25.73	27.44	25.20
2037	28.71	27.02	22.77	21.66	21.30	21.06	21.20	21.76	21.92	23.25	23.36	25.52	23.26
2038	27.33	27.26	22.43	20.94	21.10	20.59	21.56	21.25	21.83	23.17	20.97	22.73	22.59
2039	26.03	25.26	23.59	21.38	21.24	21.10	21.10	21.35	21.71	21.67	21.73	23.39	22.45
2040	26.44	27.67	24.74	22.72	22.60	22.69	22.41	22.58	23.23	23.78	22.60	24.84	23.85
2041	29.65	29.07	25.30	23.26	22.83	22.66	23.80	24.56	25.24	23.58	25.87	28.01	25.30
2042	30.23	32.39	27.86	25.54	25.40	25.23	26.18	26.30	26.50	25.03	26.38	30.37	27.25
2043	31.00	34.25	28.19	26.20	26.06	26.01	27.14	27.26	27.48	26.40	27.12	30.52	28.09
2044	33.26	39.31	32.44	30.17	30.04	30.00	32.95	33.24	33.48	29.63	31.19	33.73	32.42
2045	36.78	43.87	37.87	35.38	35.26	35.34	36.64	37.16	37.43	33.12	36.83	39.38	37.03
2046	43.35	47.02	40.40	37.97	37.85	37.88	39.86	40.24	40.53	36.97	38.73	41.54	40.16
2047	45.53	49.74	43.88	41.32	41.21	41.25	42.66	43.10	43.41	40.43	42.92	45.84	43.41
2048	50.76	54.61	48.39	45.64	45.53	45.46	46.72	47.15	47.49	45.74	46.17	49.28	47.71
2049	53.83	58.68	51.13	48.61	48.52	48.47	49.64	50.72	51.08	48.83	50.41	53.27	51.05

Portland General Electric
Avoided Cost Study
On-Peak Energy, Wind

Table S.2a — Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024					55.01	70.33	147.41	205.61	155.58	80.03	95.34	137.20	79.21
2025	140.72	119.03	83.00	64.37	53.79	55.88	140.87	182.01	147.04	89.52	99.90	117.02	107.89
2026	22.52	22.05	19.20	16.58	15.86	16.19	16.83	16.84	16.85	17.63	20.18	22.34	18.58
2027	23.24	22.90	19.28	16.18	15.42	15.71	16.32	16.35	16.43	17.19	19.62	21.74	18.34
2028	22.69	22.33	19.09	15.99	15.21	15.42	15.97	15.97	15.92	16.71	19.48	21.65	18.02
2029	20.35	19.91	18.26	17.14	17.00	16.99	17.40	17.72	18.00	18.45	19.14	19.47	18.32
2030	18.77	18.82	17.37	16.51	16.61	16.48	16.77	16.62	16.95	17.34	18.62	19.26	17.50
2031	19.36	19.35	16.61	15.99	15.84	15.72	16.24	16.35	16.30	16.62	18.69	19.54	17.21
2032	19.12	19.58	17.41	16.12	16.03	16.28	17.31	17.42	17.97	18.79	20.34	20.99	18.12
2033	21.13	20.57	20.15	19.10	18.81	19.03	19.30	19.29	20.19	20.61	21.66	22.94	20.24
2034	24.29	22.62	21.44	20.06	20.01	19.72	19.74	20.26	20.11	20.85	21.59	22.99	21.13
2035	24.14	23.25	20.65	19.48	19.38	19.44	19.57	19.69	19.88	20.57	22.19	23.85	21.00
2036	25.10	23.72	20.53	18.98	18.85	19.21	19.12	19.21	19.38	21.07	21.31	23.01	20.80
2037	24.18	22.50	18.25	17.14	16.78	16.54	16.68	17.24	17.40	18.73	18.83	21.00	18.77
2038	22.71	22.64	17.81	16.32	16.49	15.97	16.94	16.63	17.21	18.56	16.35	18.11	17.95
2039	21.31	20.54	18.88	16.67	16.53	16.38	16.39	16.63	17.00	16.96	17.01	18.68	17.73
2040	21.62	22.86	19.92	17.90	17.78	17.88	17.60	17.77	18.42	18.96	17.78	20.03	19.03
2041	24.73	24.15	20.38	18.34	17.91	17.74	18.88	19.64	20.32	18.66	20.95	23.09	20.38
2042	25.20	27.37	22.84	20.52	20.38	20.20	21.16	21.27	21.48	20.00	21.35	25.34	22.24
2043	25.87	29.12	23.06	21.07	20.93	20.88	22.01	22.13	22.34	21.27	21.99	25.39	22.98
2044	28.02	34.07	27.20	24.93	24.80	24.76	27.71	28.00	28.24	24.39	25.95	28.48	27.20
2045	31.43	38.52	32.51	30.03	29.91	29.99	31.29	31.81	32.07	27.77	31.48	34.02	31.69
2046	37.88	41.55	34.94	32.50	32.39	32.41	34.39	34.78	35.06	31.50	33.27	36.07	34.68
2047	39.95	44.16	38.30	35.74	35.62	35.67	37.08	37.52	37.83	34.85	37.34	40.26	37.81
2048	45.05	48.91	42.68	39.94	39.83	39.76	41.01	41.45	41.78	40.04	40.47	43.57	42.03
2049	48.00	52.86	45.30	42.78	42.70	42.64	43.82	44.89	45.25	43.01	44.59	47.45	45.23

Portland General Electric
Avoided Cost Study
Off-Peak Energy, Wind

Table S.2b — Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024					39.19	41.23	62.67	82.07	70.84	65.73	76.97	106.57	45.77
2025	110.58	96.62	63.40	62.29	39.92	35.11	65.65	87.92	75.43	74.44	82.72	101.69	74.47
2026	22.52	22.05	19.20	16.58	15.86	16.19	16.83	16.84	16.85	17.63	20.18	22.34	18.57
2027	23.24	22.90	19.28	16.18	15.42	15.71	16.32	16.35	16.43	17.19	19.62	21.74	18.34
2028	22.69	22.33	19.09	15.99	15.21	15.42	15.97	15.97	15.92	16.71	19.48	21.65	18.04
2029	20.35	19.91	18.26	17.14	17.00	16.99	17.40	17.72	18.00	18.45	19.14	19.47	18.31
2030	18.77	18.82	17.37	16.51	16.61	16.48	16.77	16.62	16.95	17.34	18.62	19.26	17.50
2031	19.36	19.35	16.61	15.99	15.84	15.72	16.24	16.35	16.30	16.62	18.69	19.54	17.20
2032	19.12	19.58	17.41	16.12	16.03	16.28	17.31	17.42	17.97	18.79	20.34	20.99	18.10
2033	21.13	20.57	20.15	19.10	18.81	19.03	19.30	19.29	20.19	20.61	21.66	22.94	20.23
2034	24.29	22.62	21.44	20.06	20.01	19.72	19.74	20.26	20.11	20.85	21.59	22.99	21.15
2035	24.14	23.25	20.65	19.48	19.38	19.44	19.57	19.69	19.88	20.57	22.19	23.85	20.99
2036	25.10	23.72	20.53	18.98	18.85	19.21	19.12	19.21	19.38	21.07	21.31	23.01	20.78
2037	24.18	22.50	18.25	17.14	16.78	16.54	16.68	17.24	17.40	18.73	18.83	21.00	18.74
2038	22.71	22.64	17.81	16.32	16.49	15.97	16.94	16.63	17.21	18.56	16.35	18.11	17.97
2039	21.31	20.54	18.88	16.67	16.53	16.38	16.39	16.63	17.00	16.96	17.01	18.68	17.74
2040	21.62	22.86	19.92	17.90	17.78	17.88	17.60	17.77	18.42	18.96	17.78	20.03	19.04
2041	24.73	24.15	20.38	18.34	17.91	17.74	18.88	19.64	20.32	18.66	20.95	23.09	20.38
2042	25.20	27.37	22.84	20.52	20.38	20.20	21.16	21.27	21.48	20.00	21.35	25.34	22.22
2043	25.87	29.12	23.06	21.07	20.93	20.88	22.01	22.13	22.34	21.27	21.99	25.39	22.96
2044	28.02	34.07	27.20	24.93	24.80	24.76	27.71	28.00	28.24	24.39	25.95	28.48	27.18
2045	31.43	38.52	32.51	30.03	29.91	29.99	31.29	31.81	32.07	27.77	31.48	34.02	31.68
2046	37.88	41.55	34.94	32.50	32.39	32.41	34.39	34.78	35.06	31.50	33.27	36.07	34.69
2047	39.95	44.16	38.30	35.74	35.62	35.67	37.08	37.52	37.83	34.85	37.34	40.26	37.83
2048	45.05	48.91	42.68	39.94	39.83	39.76	41.01	41.45	41.78	40.04	40.47	43.57	42.01
2049	48.00	52.86	45.30	42.78	42.70	42.64	43.82	44.89	45.25	43.01	44.59	47.45	45.23

Portland General Electric
Avoided Cost Study
On-Peak Energy, Solar

Table S.3a — Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024					54.76	70.07	147.15	205.35	155.32	79.77	95.08	136.94	
2025	140.45	118.77	82.74	64.10	53.53	55.61	140.61	181.74	146.77	89.26	99.63	116.76	107.63
2026	22.25	21.78	18.93	16.31	15.59	15.92	16.56	16.57	16.58	17.36	19.91	22.07	18.31
2027	22.97	22.62	19.01	15.90	15.14	15.43	16.04	16.08	16.15	16.91	19.35	21.47	18.07
2028	22.41	22.05	18.81	15.70	14.93	15.14	15.68	15.69	15.64	16.42	19.20	21.37	17.73
2029	20.07	19.62	17.98	16.85	16.71	16.70	17.11	17.43	17.71	18.17	18.86	19.19	18.03
2030	19.37	19.42	17.97	17.11	17.21	17.08	17.37	17.22	17.55	17.94	19.22	19.86	18.10
2031	19.97	19.97	17.22	16.60	16.45	16.33	16.86	16.96	16.92	17.23	19.30	20.16	17.82
2032	19.75	20.20	18.04	16.74	16.65	16.91	17.93	18.04	18.60	19.41	20.96	21.62	18.74
2033	21.77	21.21	20.79	19.74	19.45	19.67	19.94	19.93	20.83	21.25	22.30	23.58	20.87
2034	24.94	23.27	22.10	20.72	20.66	20.37	20.40	20.91	20.76	21.51	22.24	23.65	21.78
2035	24.81	23.91	21.31	20.14	20.05	20.11	20.24	20.35	20.55	21.23	22.86	24.52	21.67
2036	25.78	24.41	21.22	19.66	19.53	19.89	19.80	19.89	20.06	21.75	21.99	23.69	21.48
2037	24.88	23.20	18.94	17.84	17.47	17.24	17.37	17.94	18.09	19.42	19.53	21.70	19.46
2038	23.42	23.35	18.53	17.03	17.20	16.68	17.65	17.34	17.93	19.27	17.06	18.82	18.66
2039	22.04	21.27	19.60	17.39	17.25	17.10	17.11	17.36	17.72	17.68	17.74	19.40	18.46
2040	22.36	23.60	20.66	18.64	18.52	18.62	18.34	18.51	19.16	19.70	18.53	20.77	19.77
2041	25.49	24.90	21.14	19.10	18.67	18.50	19.64	20.40	21.07	19.42	21.71	23.84	21.13
2042	25.97	28.14	23.61	21.29	21.15	20.98	21.93	22.05	22.25	20.77	22.13	26.12	23.01
2043	26.66	29.91	23.85	21.86	21.72	21.67	22.80	22.91	23.13	22.06	22.78	26.18	23.76
2044	28.82	34.88	28.00	25.74	25.61	25.57	28.51	28.81	29.05	25.19	26.75	29.29	28.00
2045	32.25	39.34	33.34	30.85	30.73	30.81	32.11	32.63	32.90	28.60	32.30	34.85	32.52
2046	38.72	42.39	35.78	33.34	33.23	33.25	35.23	35.62	35.91	32.35	34.11	36.92	35.53
2047	40.81	45.02	39.16	36.59	36.48	36.53	37.93	38.38	38.68	35.71	38.20	41.12	38.67
2048	45.93	49.78	43.56	40.81	40.70	40.64	41.89	42.32	42.66	40.92	41.35	44.45	42.91
2049	48.90	53.75	46.20	43.68	43.59	43.54	44.71	45.79	46.15	43.91	45.49	48.34	46.12

Portland General Electric
Avoided Cost Study
Off-Peak Energy, Solar

Table S.3b — Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024					38.93	40.97	62.41	81.81	70.58	65.48	76.71	106.31	
2025	110.32	96.35	63.14	62.03	39.65	34.85	65.38	87.65	75.17	74.17	82.46	101.43	74.21
2026	22.25	21.78	18.93	16.31	15.59	15.92	16.56	16.57	16.58	17.36	19.91	22.07	18.30
2027	22.97	22.62	19.01	15.90	15.14	15.43	16.04	16.08	16.15	16.91	19.35	21.47	18.07
2028	22.41	22.05	18.81	15.70	14.93	15.14	15.68	15.69	15.64	16.42	19.20	21.37	17.76
2029	20.07	19.62	17.98	16.85	16.71	16.70	17.11	17.43	17.71	18.17	18.86	19.19	18.02
2030	19.37	19.42	17.97	17.11	17.21	17.08	17.37	17.22	17.55	17.94	19.22	19.86	18.10
2031	19.97	19.97	17.22	16.60	16.45	16.33	16.86	16.96	16.92	17.23	19.30	20.16	17.82
2032	19.75	20.20	18.04	16.74	16.65	16.91	17.93	18.04	18.60	19.41	20.96	21.62	18.73
2033	21.77	21.21	20.79	19.74	19.45	19.67	19.94	19.93	20.83	21.25	22.30	23.58	20.87
2034	24.94	23.27	22.10	20.72	20.66	20.37	20.40	20.91	20.76	21.51	22.24	23.65	21.80
2035	24.81	23.91	21.31	20.14	20.05	20.11	20.24	20.35	20.55	21.23	22.86	24.52	21.66
2036	25.78	24.41	21.22	19.66	19.53	19.89	19.80	19.89	20.06	21.75	21.99	23.69	21.46
2037	24.88	23.20	18.94	17.84	17.47	17.24	17.37	17.94	18.09	19.42	19.53	21.70	19.44
2038	23.42	23.35	18.53	17.03	17.20	16.68	17.65	17.34	17.93	19.27	17.06	18.82	18.68
2039	22.04	21.27	19.60	17.39	17.25	17.10	17.11	17.36	17.72	17.68	17.74	19.40	18.46
2040	22.36	23.60	20.66	18.64	18.52	18.62	18.34	18.51	19.16	19.70	18.53	20.77	19.78
2041	25.49	24.90	21.14	19.10	18.67	18.50	19.64	20.40	21.07	19.42	21.71	23.84	21.14
2042	25.97	28.14	23.61	21.29	21.15	20.98	21.93	22.05	22.25	20.77	22.13	26.12	23.00
2043	26.66	29.91	23.85	21.86	21.72	21.67	22.80	22.91	23.13	22.06	22.78	26.18	23.75
2044	28.82	34.88	28.00	25.74	25.61	25.57	28.51	28.81	29.05	25.19	26.75	29.29	27.98
2045	32.25	39.34	33.34	30.85	30.73	30.81	32.11	32.63	32.90	28.60	32.30	34.85	32.51
2046	38.72	42.39	35.78	33.34	33.23	33.25	35.23	35.62	35.91	32.35	34.11	36.92	35.53
2047	40.81	45.02	39.16	36.59	36.48	36.53	37.93	38.38	38.68	35.71	38.20	41.12	38.69
2048	45.93	49.78	43.56	40.81	40.70	40.64	41.89	42.32	42.66	40.92	41.35	44.45	42.89
2049	48.90	53.75	46.20	43.68	43.59	43.54	44.71	45.79	46.15	43.91	45.49	48.34	46.12

Portland General Electric
Avoided Cost Study
Projected On Peak Resource Sufficiency Period Delivered Wholesale Prices

Table S.4 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	252.49	89.64	73.30	70.75	57.48	72.79	149.87	208.07	158.04	82.49	97.81	139.67	121.23
2025	143.23	121.55	85.52	66.89	56.31	58.39	143.39	184.52	149.55	92.04	102.42	119.54	110.39
2026	-	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Avoided Cost Study
Projected Off Peak Resource Sufficiency Period Delivered Wholesale Prices

Table S.5 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	197.46	72.28	63.60	61.56	41.65	43.70	65.14	84.53	73.30	68.20	79.43	109.04	80.48
2025	113.10	99.13	65.92	64.81	42.43	37.63	68.16	90.43	77.95	76.95	85.24	104.21	77.08
2026	-	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Avoided Cost Study
Total Projected Other Fixed Avoided Costs

Table S.6 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)	(1.24)
2027	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)	(1.27)
2028	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)	(1.29)
2029	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)	(1.33)
2030	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)	(1.35)
2031	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)	(1.38)
2032	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)	(1.41)
2033	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)	(1.44)
2034	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)	(1.47)
2035	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)
2036	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)	(1.53)
2037	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)	(1.57)
2038	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)	(1.60)
2039	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)	(1.64)
2040	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)	(1.67)
2041	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)	(1.71)
2042	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)	(1.74)
2043	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)	(1.78)
2044	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)	(1.81)
2045	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)	(1.86)
2046	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)	(1.90)
2047	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)	(1.94)
2048	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)	(1.98)
2049	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)

Portland General Electric
Avoided Cost Study
Total Projected Avoided Variable O&M Costs

Table S.7 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024					-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
2027	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27
2028	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34
2029	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41
2030	3.49	3.49	3.49	3.49	3.49	3.49	3.49	3.49	3.49	3.49	3.49	3.49
2031	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56
2032	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64
2033	3.71	3.71	3.71	3.71	3.71	3.71	3.71	3.71	3.71	3.71	3.71	3.71
2034	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79	3.79
2035	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87
2036	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96
2037	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04
2038	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13
2039	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22
2040	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31
2041	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40
2042	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49	4.49
2043	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59
2044	4.69	4.69	4.69	4.69	4.69	4.69	4.69	4.69	4.69	4.69	4.69	4.69
2045	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78
2046	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89
2047	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99
2048	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
2049	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21

Portland General Electric
Avoided Cost Study
Total Projected Avoided Fuel Costs

Table S.8 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	-	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-	-
2026	23.13	22.66	19.82	17.19	16.48	16.80	17.44	17.45	17.46	18.24	20.79	22.95	19.18
2027	23.87	23.52	19.91	16.80	16.04	16.33	16.94	16.98	17.05	17.81	20.25	22.37	18.97
2028	23.32	22.97	19.73	16.62	15.85	16.06	16.60	16.60	16.56	17.34	20.12	22.28	18.65
2029	21.00	20.56	18.92	17.79	17.65	17.64	18.05	18.37	18.65	19.10	19.79	20.12	18.97
2030	20.54	20.59	19.14	18.28	18.37	18.25	18.53	18.38	18.72	19.10	20.39	21.03	19.27
2031	21.16	21.16	18.41	17.79	17.64	17.53	18.05	18.15	18.11	18.43	20.50	21.35	19.01
2032	20.96	21.42	19.25	17.96	17.87	18.12	19.15	19.26	19.81	20.63	22.18	22.83	19.95
2033	23.01	22.45	22.04	20.98	20.69	20.92	21.19	21.17	22.07	22.50	23.54	24.82	22.12
2034	26.21	24.54	23.37	21.99	21.93	21.64	21.67	22.18	22.03	22.78	23.51	24.92	23.06
2035	26.11	25.21	22.61	21.44	21.35	21.40	21.54	21.65	21.84	22.53	24.15	25.81	22.96
2036	27.10	25.73	22.54	20.98	20.85	21.21	21.12	21.21	21.39	23.07	23.31	25.02	22.78
2037	26.23	24.55	20.30	19.19	18.82	18.59	18.73	19.29	19.45	20.77	20.88	23.05	20.82
2038	24.81	24.74	19.91	18.42	18.58	18.07	19.03	18.72	19.31	20.65	18.44	20.20	20.05
2039	23.45	22.68	21.02	18.81	18.66	18.52	18.53	18.77	19.13	19.09	19.15	20.82	19.87
2040	23.80	25.04	22.10	20.08	19.96	20.06	19.77	19.95	20.59	21.14	19.96	22.21	21.20
2041	26.96	26.38	22.61	20.57	20.14	19.97	21.11	21.87	22.55	20.89	23.18	25.32	22.62
2042	27.48	29.64	25.12	22.80	22.66	22.48	23.44	23.55	23.76	22.28	23.63	27.62	24.51
2043	28.20	31.44	25.38	23.40	23.25	23.21	24.33	24.45	24.67	23.59	24.31	27.71	25.29
2044	30.39	36.44	29.57	27.30	27.17	27.13	30.08	30.37	30.61	26.76	28.32	30.85	29.54
2045	33.86	40.94	34.94	32.45	32.33	32.41	33.71	34.23	34.50	30.20	33.91	36.45	34.13
2046	40.36	44.03	37.41	34.98	34.87	34.89	36.87	37.25	37.54	33.98	35.74	38.55	37.17
2047	42.48	46.69	40.83	38.27	38.15	38.20	39.61	40.05	40.36	37.38	39.87	42.79	40.35
2048	47.64	51.49	45.27	42.52	42.41	42.34	43.60	44.03	44.37	42.63	43.05	46.16	44.59
2049	50.64	55.50	47.94	45.42	45.34	45.28	46.46	47.53	47.89	45.65	47.23	50.09	47.89

Portland General Electric
Avoided Cost Study
Forecasted Gas Price - GPf ($/MMBtu - without transportation)

Table S.9a Nominal $/MMbtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	-	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-	-
2026													2.72
2027													2.68
2028													2.64
2029													2.68
2030													2.72
2031													2.68
2032													2.82
2033													3.13
2034													3.26
2035													3.25
2036													3.22
2037													2.93
2038													2.82
2039													2.79
2040													2.98
2041													3.19
2042													3.46
2043													3.57
2044													4.19
2045													4.85
2046													5.29
2047													5.75
2048													6.36
2049													6.84

Portland General Electric
Avoided Cost Study
Forecasted Gas Price - GPf ($/MMBtu - including transportation)

Table S.9b Nominal $/MMbtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	-	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-	-
2026													2.80
2027													2.77
2028													2.72
2029													2.76
2030													2.81
2031													2.77
2032													2.91
2033													3.23
2034													3.37
2035													3.35
2036													3.32
2037													3.03
2038													2.91
2039													2.88
2040													3.08
2041													3.29
2042													3.57
2043													3.69
2044													4.32
2045													5.00
2046													5.46
2047													5.93
2048													6.56
2049													7.05

Standard Capacity Tables

Portland General Electric
Avoided Cost Study
On Peak Capacity, Base Load

Table S.10a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60
2027	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49
2028	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39
2029	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32
2030	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26
2031	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23
2032	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92
2033	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22
2034	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41
2035	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30
2036	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21
2037	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47
2038	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59
2039	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73
2040	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90
2041	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09
2042	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31
2043	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56
2044	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63
2045	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32
2046	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45
2047	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80
2048	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97
2049	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60

Portland General Electric
Avoided Cost Study
Off Peak Capacity, Base Load

Table S.10b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Avoided Cost Study
On Peak Capacity, Wind

Table S.11a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22
2027	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65
2028	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09
2029	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54
2030	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
2031	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47
2032	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80
2033	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44
2034	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02
2035	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45
2036	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89
2037	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50
2038	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05
2039	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60
2040	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17
2041	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75
2042	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34
2043	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95
2044	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47
2045	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29
2046	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84
2047	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50
2048	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07
2049	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86

Portland General Electric
Avoided Cost Study
Off Peak Capacity, Wind

Table S.11b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Avoided Cost Study
On Peak Capacity, Solar

Table S.12a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58
2027	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28
2028	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99
2029	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71
2030	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45
2031	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21
2032	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74
2033	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77
2034	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70
2035	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40
2036	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11
2037	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10
2038	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97
2039	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87
2040	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78
2041	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72
2042	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67
2043	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64
2044	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49
2045	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81
2046	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69
2047	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75
2048	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67
2049	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94

Portland General Electric
Avoided Cost Study
Off Peak Capacity, Solar

Table S.12b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Avoided Cost Study
On Peak Capacity, Solar + Storage

Table S.13a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11
2027	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65
2028	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22
2029	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07
2030	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47
2031	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14
2032	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85
2033	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60
2034	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65
2035	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20
2036	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06
2037	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96
2038	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90
2039	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88
2040	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22
2041	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98
2042	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09
2043	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24
2044	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45
2045	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04
2046	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99
2047	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34
2048	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74
2049	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18

Portland General Electric
Avoided Cost Study
Off Peak Capacity, Solar + Storage

Table S.13b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

UM 1728

Application to Update Schedule 201
Avoided Cost Power Purchase Information

Attachment B
Description of Renewable Avoided Costs

PORTLAND GENERAL ELECTRIC COMPANY
RENEWABLE AVOIDED COST STUDY
2024 ANNUAL UPDATE

Introduction

This avoided cost update is consistent with PGE's 2023 Integrated Resource Plan (IRP). The Commission directs electric utilities to make an avoided cost filing within 30 days of IRP acknowledgement.

Integrated Resource Plan

The Commission acknowledged PGE's 2023 IRP at its January 25, 2024 special public meeting. The 2023 IRP forms the basis of most of the inputs in this avoided cost study.

Below is a summary of the changes:

Deficiency/Sufficiency Periods

The Deficiency/Sufficiency periods have been updated based on the 2023 IRP. The current Deficiency/Sufficiency periods are stated below for reference purposes:

- Resource Sufficiency Period is the period from the current year through 2025.
- Resource Deficiency Period is the period beginning in 2026.

Electricity Market Projections

The forward trading curves are based on market prices for electricity delivered to PGE's system. The forward trading curves adjusted for delivery are used to price avoided costs during a resource sufficiency period. For January 2024 through December 2025, the market prices are based on PGE's forward trading curve from January 31, 2024.

The current Schedule 201 prices, wheeling costs are based on 2023 BPA rates consistent with the 2023 IRP, adjusted for inflation.

Production Tax Credits

There are no changes since PGE's last avoided cost update in May 2023.

Summary of Avoided Cost Estimates

Tables R.1 through R.3 and R.10 (following) summarize PGE avoided cost prices. Tables R.1a, R.1b, R.2a, R.2b, R.3a, R.3b and R 10[1] are estimates of monthly on- and off-peak renewable avoided costs for over twenty years beginning in January 2024. The renewable resource sufficiency period prices (expressed in $/MWh or mills/kWh) for the years 2024

[1] R1: Base Load QF; R2: Wind QF; R3: Solar QF, R10 Interim Solar plus Storage QF.

through 2025 are based on the forward electricity curves adjusted for delivery as discussed above.

Renewable avoided cost prices beginning January 2026 are represented by the fully allocated costs of a renewable wind resource based on PGE's acknowledged 2023 IRP[2] with applicable adjustments for capacity value. The energy portion of the on- and off-peak prices are shaped using the on- and off-peak monthly shape factors based on the 2025 market prices. On-peak periods are from 6 a.m. through 10 p.m. Mondays through Saturdays.[3] The off-peak hours are from 10 p.m. until 6 a.m. Mondays through Saturdays and all twenty-four hours on Sunday. For the interim Solar plus Storage rate the four daily premium peak hours are daylight savings months (March–October): 6:00 PM – 10:00 PM and winter months (November–February): 5:00 AM – 7:00 AM and 7:00 PM – 9:00 PM.[4] Table R.4 provides the wind integration costs. Tables R.5 and R.6 show the on- and off-peak resource sufficiency rates.

Avoided Cost Components

Energy:
Tables R.7, R.8 and R.9 are the basis for energy during the deficiency period.
Table R.8 shows the full value of a wind resource (as flat $/MWh). Table 7 isolates the value of wind capacity using a 4-hour battery as the capacity proxy resource. Tables R.9 shows the full value of a wind resource less wind capacity value (Table 8 less Table 7 equates to Table 9).

To arrive at final renewable energy pricing, the full value of a wind resource less the capacity value of wind is shaped via monthly shape factors as described above.

Capacity:
Table R10a and b, R.1a and b, R.12a and b and R.13a and b isolate the capacity portion of avoided cost prices for Base Load, Wind, and Solar QFs (both on- and off-peak) using a 4-hour battery as the capacity proxy resource.

[2] Acknowledged at the OPUC January 25, 2024 Public Meeting.
[3] Schedule 201, Sheet 201-3.
[4] *Id.*

Renewable Energy Tables

Portland General Electric
Renewable Avoided Cost Study
On-Peak Energy, Base Load

Table R.1a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	252.49	89.64	73.30	70.75	57.48	72.79	149.87	208.07	158.04	82.49	97.81	139.67	
2025	143.23	121.55	85.52	66.89	56.31	58.39	143.39	184.52	149.55	92.04	102.42	119.54	110.41
2026	25.79	21.88	15.40	12.04	10.14	10.51	25.82	33.22	26.93	16.57	18.44	21.52	19.88
2027	26.34	22.35	15.73	12.30	10.35	10.74	26.37	33.93	27.50	16.92	18.83	21.98	20.28
2028	26.83	22.77	16.02	12.53	10.55	10.94	26.86	34.56	28.01	17.24	19.18	22.39	20.67
2029	27.47	23.32	16.40	12.83	10.80	11.20	27.51	35.40	28.69	17.65	19.65	22.93	21.15
2030	28.06	23.81	16.75	13.10	11.03	11.44	28.09	36.15	29.30	18.03	20.06	23.42	21.64
2031	28.66	24.32	17.11	13.38	11.27	11.68	28.69	36.92	29.92	18.42	20.49	23.92	22.09
2032	29.19	24.77	17.43	13.63	11.48	11.90	29.22	37.61	30.48	18.76	20.87	24.36	22.50
2033	29.90	25.37	17.85	13.96	11.75	12.19	29.93	38.51	31.21	19.21	21.38	24.95	23.04
2034	30.53	25.91	18.23	14.26	12.00	12.45	30.57	39.33	31.88	19.62	21.83	25.48	23.52
2035	31.18	26.46	18.62	14.56	12.26	12.71	31.22	40.17	32.56	20.04	22.30	26.03	24.00
2036	31.76	26.95	18.96	14.83	12.49	12.95	31.80	40.92	33.16	20.41	22.71	26.51	24.49
2037	32.53	27.60	19.42	15.19	12.79	13.26	32.57	41.91	33.96	20.90	23.26	27.15	25.08
2038	33.22	28.19	19.84	15.51	13.06	13.54	33.26	42.80	34.69	21.35	23.76	27.73	25.58
2039	33.93	28.80	20.26	15.85	13.34	13.83	33.97	43.71	35.43	21.80	24.26	28.32	26.15
2040	34.56	29.33	20.63	16.14	13.59	14.09	34.60	44.52	36.09	22.21	24.71	28.84	26.59
2041	35.40	30.04	21.13	16.53	13.92	14.43	35.43	45.60	36.96	22.74	25.31	29.54	27.30
2042	36.15	30.68	21.58	16.88	14.21	14.74	36.19	46.57	37.75	23.23	25.85	30.17	27.87
2043	36.92	31.33	22.04	17.24	14.52	15.05	36.96	47.56	38.55	23.72	26.40	30.81	28.46
2044	37.61	31.91	22.45	17.56	14.78	15.33	37.65	48.45	39.27	24.16	26.89	31.39	28.99
2045	38.51	32.68	22.99	17.98	15.14	15.70	38.56	49.62	40.21	24.75	27.54	32.14	29.67
2046	39.33	33.38	23.48	18.37	15.46	16.04	39.38	50.67	41.07	25.28	28.13	32.83	30.28
2047	40.17	34.09	23.99	18.76	15.79	16.38	40.22	51.75	41.95	25.81	28.73	33.53	30.98
2048	40.92	34.72	24.43	19.11	16.09	16.68	40.96	52.71	42.72	26.29	29.26	34.15	31.55
2049	41.91	35.56	25.02	19.57	16.47	17.08	41.95	53.99	43.76	26.93	29.96	34.97	32.26

Capacity Removed, Aurora Shaping

Portland General Electric
Renewable Avoided Cost Study
Off-Peak Energy, Base Load

Table R.1b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	197.46	72.28	63.60	61.56	41.65	43.70	65.14	84.53	73.30	68.20	79.43	109.04	
2025	113.10	99.13	65.92	64.81	42.43	37.63	68.16	90.43	77.95	76.95	85.24	104.21	76.99
2026	20.36	17.85	11.87	11.67	7.64	6.77	12.27	16.28	14.03	13.86	15.35	18.76	13.87
2027	20.80	18.23	12.12	11.92	7.80	6.92	12.53	16.63	14.33	14.15	15.67	19.16	14.19
2028	21.18	18.57	12.35	12.14	7.95	7.05	12.77	16.94	14.60	14.41	15.96	19.52	14.49
2029	21.69	19.02	12.64	12.43	8.14	7.22	13.08	17.35	14.95	14.76	16.35	19.99	14.80
2030	22.16	19.42	12.91	12.70	8.31	7.37	13.35	17.72	15.27	15.08	16.70	20.42	15.09
2031	22.63	19.84	13.19	12.97	8.49	7.53	13.64	18.09	15.60	15.40	17.05	20.85	15.40
2032	23.05	20.20	13.43	13.21	8.65	7.67	13.89	18.43	15.89	15.68	17.37	21.24	15.71
2033	23.61	20.69	13.76	13.53	8.86	7.85	14.23	18.87	16.27	16.06	17.79	21.75	16.09
2034	24.11	21.13	14.05	13.82	9.05	8.02	14.53	19.28	16.62	16.40	18.17	22.21	16.48
2035	24.62	21.58	14.35	14.11	9.24	8.19	14.84	19.69	16.97	16.75	18.56	22.69	16.80
2036	25.08	21.98	14.62	14.37	9.41	8.34	15.12	20.05	17.29	17.06	18.90	23.11	17.08
2037	25.69	22.51	14.97	14.72	9.64	8.55	15.48	20.54	17.70	17.48	19.36	23.67	17.49
2038	26.23	22.99	15.29	15.03	9.84	8.73	15.81	20.98	18.08	17.85	19.77	24.17	17.90
2039	26.79	23.48	15.62	15.35	10.05	8.91	16.15	21.42	18.47	18.23	20.19	24.69	18.26
2040	27.29	23.92	15.91	15.64	10.24	9.08	16.45	21.82	18.81	18.57	20.57	25.14	18.66
2041	27.95	24.50	16.29	16.02	10.49	9.30	16.84	22.35	19.26	19.02	21.06	25.75	19.03
2042	28.54	25.02	16.64	16.36	10.71	9.50	17.20	22.82	19.67	19.42	21.51	26.30	19.43
2043	29.15	25.55	16.99	16.71	10.94	9.70	17.57	23.31	20.09	19.84	21.97	26.86	19.85
2044	29.69	26.03	17.31	17.02	11.14	9.88	17.90	23.74	20.47	20.20	22.38	27.36	20.25
2045	30.41	26.66	17.73	17.43	11.41	10.12	18.33	24.32	20.96	20.69	22.92	28.02	20.78
2046	31.06	27.22	18.10	17.80	11.65	10.33	18.72	24.83	21.41	21.13	23.41	28.62	21.19
2047	31.72	27.81	18.49	18.18	11.90	10.55	19.12	25.36	21.86	21.58	23.91	29.23	21.60
2048	32.31	28.32	18.83	18.52	12.12	10.75	19.47	25.83	22.27	21.98	24.35	29.77	22.01
2049	33.09	29.00	19.29	18.96	12.41	11.01	19.94	26.46	22.81	22.51	24.94	30.49	22.58

Capacity Removed, Aurora Shaping

Portland General Electric
Renewable Avoided Cost Study
On-Peak Energy, Wind

Table R.2a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	0.00	0.00	0.00	0.00	55.01	70.33	147.41	205.61	155.58	80.03	95.34	137.20	
2025	140.72	119.03	83.00	64.37	53.79	55.88	140.87	182.01	147.04	89.52	99.90	117.02	107.89
2026	23.22	19.31	12.83	9.47	7.57	7.94	23.25	30.65	24.36	14.00	15.87	18.95	17.31
2027	23.71	19.73	13.10	9.67	7.73	8.11	23.74	31.31	24.88	14.30	16.21	19.36	17.65
2028	24.15	20.09	13.34	9.85	7.87	8.26	24.18	31.88	25.33	14.56	16.50	19.71	17.99
2029	24.74	20.58	13.67	10.09	8.06	8.46	24.77	32.66	25.95	14.92	16.91	20.19	18.41
2030	24.16	19.91	12.85	9.20	7.13	7.54	24.19	32.25	25.40	14.13	16.16	19.52	17.74
2031	24.68	20.34	13.13	9.40	7.28	7.70	24.71	32.94	25.94	14.43	16.51	19.94	18.11
2032	25.12	20.70	13.36	9.56	7.41	7.83	25.16	33.54	26.41	14.69	16.80	20.29	18.43
2033	25.74	21.21	13.69	9.81	7.60	8.03	25.77	34.36	27.06	15.06	17.22	20.80	18.89
2034	26.29	21.67	13.99	10.01	7.76	8.20	26.32	35.09	27.64	15.38	17.59	21.24	19.28
2035	26.85	22.13	14.28	10.23	7.93	8.38	26.88	35.84	28.23	15.70	17.96	21.69	19.67
2036	27.34	22.53	14.54	10.41	8.06	8.52	27.37	36.49	28.74	15.98	18.28	22.08	20.06
2037	28.01	23.08	14.90	10.67	8.27	8.74	28.04	37.39	29.44	16.38	18.74	22.63	20.55
2038	28.61	23.58	15.22	10.90	8.44	8.93	28.64	38.18	30.07	16.73	19.14	23.11	20.96
2039	29.22	24.08	15.54	11.13	8.62	9.12	29.25	39.00	30.71	17.09	19.55	23.60	21.44
2040	29.74	24.51	15.82	11.32	8.77	9.27	29.78	39.71	31.27	17.39	19.90	24.03	21.77
2041	30.48	25.12	16.21	11.61	9.00	9.51	30.51	40.68	32.04	17.82	20.39	24.62	22.38
2042	31.13	25.65	16.56	11.86	9.19	9.71	31.17	41.55	32.72	18.20	20.82	25.15	22.84
2043	31.79	26.20	16.91	12.11	9.38	9.92	31.83	42.43	33.42	18.59	21.27	25.68	23.33
2044	32.37	26.67	17.21	12.32	9.54	10.09	32.41	43.21	34.02	18.92	21.65	26.14	23.75
2045	33.16	27.33	17.64	12.63	9.79	10.35	33.20	44.26	34.86	19.40	22.19	26.79	24.31
2046	33.87	27.91	18.02	12.90	10.00	10.57	33.91	45.21	35.60	19.81	22.66	27.36	24.81
2047	34.59	28.51	18.40	13.18	10.21	10.79	34.63	46.17	36.36	20.23	23.14	27.95	25.40
2048	35.22	29.02	18.73	13.41	10.38	10.98	35.26	47.01	37.02	20.59	23.56	28.45	25.85
2049	36.08	29.74	19.20	13.74	10.65	11.26	36.13	48.16	37.93	21.10	24.14	29.15	26.44

Capacity Removed, Aurora Shaping, Integration Removed

Portland General Electric
Renewable Avoided Cost Study
Off-Peak Energy, Wind

Table R.2b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	0.00	0.00	0.00	0.00	39.19	41.23	62.67	82.07	70.84	65.73	76.97	106.57	
2025	110.58	96.62	63.40	62.29	39.92	35.11	65.65	87.92	75.43	74.44	82.72	101.69	74.47
2026	17.79	15.28	9.30	9.10	5.07	4.20	9.70	13.71	11.46	11.29	12.78	16.19	11.30
2027	18.17	15.60	9.50	9.29	5.18	4.29	9.91	14.00	11.71	11.53	13.05	16.54	11.57
2028	18.50	15.89	9.67	9.46	5.27	4.37	10.09	14.26	11.92	11.73	13.28	16.84	11.80
2029	18.96	16.28	9.91	9.69	5.40	4.48	10.34	14.61	12.21	12.02	13.61	17.25	12.06
2030	18.26	15.52	9.01	8.80	4.41	3.47	9.45	13.82	11.37	11.18	12.80	16.52	11.19
2031	18.65	15.85	9.21	8.98	4.51	3.55	9.66	14.11	11.61	11.41	13.07	16.87	11.42
2032	18.98	16.14	9.37	9.14	4.58	3.60	9.82	14.36	11.82	11.62	13.30	17.17	11.64
2033	19.45	16.54	9.60	9.37	4.70	3.70	10.07	14.72	12.11	11.91	13.64	17.60	11.93
2034	19.87	16.89	9.81	9.57	4.80	3.78	10.29	15.03	12.37	12.16	13.93	17.97	12.23
2035	20.29	17.25	10.02	9.78	4.90	3.86	10.51	15.35	12.64	12.42	14.22	18.35	12.46
2036	20.65	17.56	10.19	9.95	4.98	3.92	10.69	15.63	12.86	12.64	14.48	18.68	12.66
2037	21.16	17.99	10.45	10.20	5.12	4.02	10.96	16.02	13.18	12.96	14.84	19.15	12.97
2038	21.62	18.38	10.67	10.42	5.22	4.11	11.19	16.36	13.46	13.23	15.15	19.55	13.28
2039	22.08	18.77	10.90	10.64	5.34	4.20	11.43	16.71	13.75	13.51	15.48	19.97	13.54
2040	22.47	19.10	11.09	10.82	5.42	4.26	11.63	17.00	13.99	13.75	15.75	20.33	13.85
2041	23.03	19.58	11.37	11.10	5.57	4.38	11.92	17.43	14.34	14.10	16.14	20.83	14.11
2042	23.52	20.00	11.61	11.33	5.68	4.47	12.18	17.80	14.65	14.40	16.49	21.28	14.41
2043	24.02	20.42	11.86	11.58	5.81	4.57	12.44	18.18	14.96	14.71	16.84	21.73	14.72
2044	24.45	20.79	12.07	11.78	5.90	4.64	12.66	18.50	15.22	14.96	17.14	22.12	15.01
2045	25.06	21.30	12.37	12.07	6.06	4.77	12.98	18.96	15.61	15.34	17.57	22.67	15.43
2046	25.59	21.76	12.64	12.33	6.19	4.87	13.25	19.37	15.94	15.67	17.94	23.15	15.72
2047	26.14	22.22	12.91	12.59	6.32	4.97	13.53	19.78	16.28	16.00	18.32	23.64	16.02
2048	26.61	22.62	13.13	12.81	6.42	5.05	13.77	20.13	16.57	16.28	18.65	24.07	16.31
2049	27.27	23.18	13.46	13.14	6.59	5.18	14.12	20.63	16.98	16.69	19.11	24.66	16.76

Capacity Removed, Aurora Shaping, Integration Removed

Portland General Electric
Renewable Avoided Cost Study
On-Peak Energy, Solar

Table R.3a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	0.00	0.00	0.00	0.00	54.76	70.07	147.15	205.35	155.32	79.77	95.08	136.94	
2025	140.45	118.77	82.74	64.10	53.53	55.61	140.61	181.74	146.77	89.26	99.63	116.76	107.63
2026	22.95	19.04	12.56	9.20	7.30	7.67	22.98	30.38	24.09	13.73	15.60	18.68	17.04
2027	23.44	19.45	12.83	9.40	7.45	7.84	23.47	31.03	24.60	14.02	15.93	19.08	17.38
2028	23.87	19.80	13.05	9.57	7.58	7.97	23.89	31.60	25.05	14.28	16.22	19.43	17.71
2029	24.45	20.29	13.38	9.80	7.78	8.17	24.48	32.37	25.66	14.63	16.62	19.90	18.12
2030	24.76	20.51	13.45	9.80	7.73	8.14	24.79	32.85	26.00	14.73	16.76	20.12	18.34
2031	25.29	20.95	13.74	10.01	7.90	8.31	25.32	33.55	26.55	15.05	17.12	20.55	18.72
2032	25.75	21.33	13.99	10.19	8.03	8.46	25.78	34.16	27.04	15.32	17.43	20.92	19.06
2033	26.38	21.85	14.33	10.44	8.24	8.67	26.41	35.00	27.70	15.69	17.86	21.43	19.53
2034	26.94	22.32	14.64	10.67	8.41	8.86	26.98	35.74	28.29	16.03	18.24	21.89	19.93
2035	27.52	22.80	14.95	10.89	8.59	9.05	27.55	36.51	28.89	16.37	18.63	22.36	20.34
2036	28.02	23.21	15.22	11.09	8.74	9.20	28.05	37.17	29.42	16.66	18.97	22.76	20.75
2037	28.70	23.78	15.60	11.36	8.96	9.44	28.74	38.08	30.14	17.08	19.43	23.32	21.25
2038	29.32	24.29	15.93	11.61	9.15	9.64	29.35	38.89	30.78	17.44	19.85	23.82	21.67
2039	29.94	24.80	16.27	11.85	9.35	9.84	29.98	39.72	31.44	17.81	20.27	24.33	22.16
2040	30.49	25.25	16.56	12.06	9.51	10.01	30.52	40.45	32.01	18.13	20.64	24.77	22.51
2041	31.23	25.87	16.97	12.37	9.75	10.27	31.27	41.44	32.79	18.58	21.15	25.38	23.14
2042	31.90	26.43	17.33	12.63	9.96	10.49	31.94	42.32	33.49	18.98	21.60	25.92	23.61
2043	32.58	26.99	17.70	12.90	10.17	10.71	32.62	43.22	34.21	19.38	22.06	26.47	24.12
2044	33.17	27.48	18.02	13.13	10.35	10.90	33.21	44.01	34.83	19.73	22.45	26.95	24.56
2045	33.98	28.15	18.47	13.46	10.61	11.17	34.03	45.09	35.68	20.22	23.01	27.61	25.14
2046	34.71	28.75	18.86	13.74	10.84	11.41	34.75	46.05	36.44	20.65	23.50	28.20	25.65
2047	35.45	29.37	19.26	14.04	11.07	11.65	35.49	47.03	37.22	21.09	24.00	28.80	26.26
2048	36.09	29.90	19.61	14.28	11.26	11.86	36.14	47.89	37.90	21.47	24.43	29.33	26.73
2049	36.98	30.63	20.09	14.64	11.55	12.16	37.02	49.06	38.83	22.00	25.04	30.05	27.33

Capacity Removed, Aurora Shaping, Integration Removed

Portland General Electric
Renewable Avoided Cost Study
Off-Peak Energy, Solar

Table R.3b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	0.00	0.00	0.00	0.00	38.93	40.97	62.41	81.81	70.58	65.48	76.71	106.31	
2025	110.32	96.35	63.14	62.03	39.65	34.85	65.38	87.65	75.17	74.17	82.46	101.43	74.21
2026	17.52	15.01	9.03	8.83	4.80	3.93	9.43	13.44	11.19	11.02	12.51	15.92	11.03
2027	17.90	15.33	9.22	9.02	4.90	4.02	9.63	13.73	11.43	11.25	12.77	16.26	11.29
2028	18.22	15.61	9.38	9.18	4.98	4.09	9.80	13.98	11.64	11.45	13.00	16.56	11.52
2029	18.67	15.99	9.62	9.41	5.11	4.19	10.05	14.32	11.93	11.74	13.32	16.96	11.77
2030	18.86	16.12	9.61	9.40	5.01	4.07	10.05	14.42	11.97	11.78	13.40	17.12	11.79
2031	19.26	16.47	9.82	9.60	5.12	4.16	10.27	14.72	12.23	12.03	13.68	17.48	12.03
2032	19.61	16.76	9.99	9.77	5.21	4.23	10.45	14.99	12.44	12.24	13.93	17.80	12.26
2033	20.09	17.18	10.24	10.01	5.34	4.34	10.71	15.36	12.75	12.55	14.27	18.23	12.57
2034	20.52	17.54	10.46	10.23	5.45	4.43	10.94	15.69	13.03	12.81	14.58	18.62	12.89
2035	20.96	17.92	10.68	10.44	5.57	4.53	11.17	16.02	13.30	13.09	14.89	19.02	13.13
2036	21.34	18.24	10.87	10.63	5.66	4.60	11.37	16.31	13.54	13.32	15.16	19.36	13.34
2037	21.86	18.69	11.15	10.89	5.81	4.72	11.65	16.71	13.88	13.65	15.53	19.84	13.66
2038	22.33	19.09	11.38	11.13	5.93	4.82	11.90	17.07	14.17	13.94	15.86	20.26	13.99
2039	22.80	19.49	11.63	11.36	6.06	4.92	12.16	17.43	14.48	14.24	16.20	20.70	14.27
2040	23.21	19.84	11.83	11.56	6.16	5.00	12.37	17.74	14.73	14.49	16.49	21.07	14.59
2041	23.79	20.33	12.13	11.85	6.32	5.14	12.68	18.18	15.10	14.85	16.90	21.59	14.87
2042	24.29	20.77	12.39	12.11	6.46	5.25	12.95	18.57	15.42	15.17	17.26	22.05	15.18
2043	24.81	21.21	12.65	12.36	6.60	5.36	13.23	18.97	15.75	15.49	17.63	22.52	15.51
2044	25.26	21.59	12.87	12.58	6.71	5.44	13.46	19.31	16.03	15.77	17.94	22.93	15.82
2045	25.88	22.13	13.20	12.90	6.88	5.59	13.80	19.79	16.43	16.16	18.39	23.49	16.25
2046	26.43	22.60	13.48	13.17	7.03	5.71	14.09	20.21	16.78	16.51	18.78	23.99	16.56
2047	27.00	23.08	13.76	13.45	7.18	5.83	14.39	20.64	17.14	16.86	19.18	24.50	16.88
2048	27.49	23.50	14.01	13.69	7.30	5.92	14.65	21.01	17.44	17.16	19.52	24.95	17.19
2049	28.16	24.08	14.36	14.03	7.49	6.08	15.01	21.53	17.88	17.59	20.01	25.56	17.65

Capacity Removed, Aurora Shaping, Integration Removed

	Portland General Electric	
	Renewable Avoided Cost Study	
	Integration Costs	
Table R.4	Nominal $/MWh	
Year	Wind	Solar
2024	2.46	2.72
2025	2.52	2.78
2026	2.57	2.84
2027	2.62	2.90
2028	2.68	2.96
2029	2.74	3.03
2030	3.90	3.30
2031	3.98	3.37
2032	4.07	3.44
2033	4.15	3.52
2034	4.24	3.59
2035	4.33	3.67
2036	4.43	3.75
2037	4.52	3.83
2038	4.62	3.91
2039	4.72	3.99
2040	4.82	4.08
2041	4.92	4.16
2042	5.02	4.25
2043	5.13	4.34
2044	5.24	4.43
2045	5.35	4.53
2046	5.47	4.63
2047	5.58	4.72
2048	5.70	4.83
2049	5.82	4.93

Portland General Electric												
Renewable Avoided Cost Study												
Sufficiency Period: Projected On Peak Delivered Wholesale Prices												
Table R.5											Nominal $/MWh	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	252.49	89.64	73.30	70.75	57.48	72.79	149.87	208.07	158.04	82.49	97.81	139.67
2025	143.23	121.55	85.52	66.89	56.31	58.39	143.39	184.52	149.55	92.04	102.42	119.54
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Renewable Avoided Cost Study
Sufficiency Period: Projected Off Peak Delivered Wholesale Prices

Table R.6 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	197.46	72.28	63.60	61.56	41.65	43.70	65.14	84.53	73.30	68.20	79.43	109.04
2025	113.10	99.13	65.92	64.81	42.43	37.63	68.16	90.43	77.95	76.95	85.24	104.21
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Renewable Avoided Cost Study
Deficiency Period: Value of Wind Capacity, Flat $/MWh

Table R.7 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09
2027	12.34	12.34	12.34	12.34	12.34	12.34	12.34	12.34	12.34	12.34	12.34	12.34
2028	12.57	12.57	12.57	12.57	12.57	12.57	12.57	12.57	12.57	12.57	12.57	12.57
2029	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88
2030	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15
2031	13.43	13.43	13.43	13.43	13.43	13.43	13.43	13.43	13.43	13.43	13.43	13.43
2032	13.68	13.68	13.68	13.68	13.68	13.68	13.68	13.68	13.68	13.68	13.68	13.68
2033	14.01	14.01	14.01	14.01	14.01	14.01	14.01	14.01	14.01	14.01	14.01	14.01
2034	14.31	14.31	14.31	14.31	14.31	14.31	14.31	14.31	14.31	14.31	14.31	14.31
2035	14.61	14.61	14.61	14.61	14.61	14.61	14.61	14.61	14.61	14.61	14.61	14.61
2036	14.88	14.88	14.88	14.88	14.88	14.88	14.88	14.88	14.88	14.88	14.88	14.88
2037	15.24	15.24	15.24	15.24	15.24	15.24	15.24	15.24	15.24	15.24	15.24	15.24
2038	15.57	15.57	15.57	15.57	15.57	15.57	15.57	15.57	15.57	15.57	15.57	15.57
2039	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90
2040	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20
2041	16.59	16.59	16.59	16.59	16.59	16.59	16.59	16.59	16.59	16.59	16.59	16.59
2042	16.94	16.94	16.94	16.94	16.94	16.94	16.94	16.94	16.94	16.94	16.94	16.94
2043	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30
2044	17.62	17.62	17.62	17.62	17.62	17.62	17.62	17.62	17.62	17.62	17.62	17.62
2045	18.05	18.05	18.05	18.05	18.05	18.05	18.05	18.05	18.05	18.05	18.05	18.05
2046	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43
2047	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83
2048	19.18	19.18	19.18	19.18	19.18	19.18	19.18	19.18	19.18	19.18	19.18	19.18
2049	19.64	19.64	19.64	19.64	19.64	19.64	19.64	19.64	19.64	19.64	19.64	19.64

Portland General Electric
Renewable Avoided Cost Study
Deficiency Period: Full Wind Cost, Flat $/MWh

Table R.8 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	29.39	29.39	29.39	29.39	29.39	29.39	29.39	29.39	29.39	29.39	29.39	29.39
2027	30.01	30.01	30.01	30.01	30.01	30.01	30.01	30.01	30.01	30.01	30.01	30.01
2028	30.57	30.57	30.57	30.57	30.57	30.57	30.57	30.57	30.57	30.57	30.57	30.57
2029	31.31	31.31	31.31	31.31	31.31	31.31	31.31	31.31	31.31	31.31	31.31	31.31
2030	31.98	31.98	31.98	31.98	31.98	31.98	31.98	31.98	31.98	31.98	31.98	31.98
2031	32.66	32.66	32.66	32.66	32.66	32.66	32.66	32.66	32.66	32.66	32.66	32.66
2032	33.26	33.26	33.26	33.26	33.26	33.26	33.26	33.26	33.26	33.26	33.26	33.26
2033	34.07	34.07	34.07	34.07	34.07	34.07	34.07	34.07	34.07	34.07	34.07	34.07
2034	34.79	34.79	34.79	34.79	34.79	34.79	34.79	34.79	34.79	34.79	34.79	34.79
2035	35.54	35.54	35.54	35.54	35.54	35.54	35.54	35.54	35.54	35.54	35.54	35.54
2036	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19
2037	37.07	37.07	37.07	37.07	37.07	37.07	37.07	37.07	37.07	37.07	37.07	37.07
2038	37.86	37.86	37.86	37.86	37.86	37.86	37.86	37.86	37.86	37.86	37.86	37.86
2039	38.67	38.67	38.67	38.67	38.67	38.67	38.67	38.67	38.67	38.67	38.67	38.67
2040	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38
2041	40.33	40.33	40.33	40.33	40.33	40.33	40.33	40.33	40.33	40.33	40.33	40.33
2042	41.19	41.19	41.19	41.19	41.19	41.19	41.19	41.19	41.19	41.19	41.19	41.19
2043	42.07	42.07	42.07	42.07	42.07	42.07	42.07	42.07	42.07	42.07	42.07	42.07
2044	42.85	42.85	42.85	42.85	42.85	42.85	42.85	42.85	42.85	42.85	42.85	42.85
2045	43.89	43.89	43.89	43.89	43.89	43.89	43.89	43.89	43.89	43.89	43.89	43.89
2046	44.82	44.82	44.82	44.82	44.82	44.82	44.82	44.82	44.82	44.82	44.82	44.82
2047	45.78	45.78	45.78	45.78	45.78	45.78	45.78	45.78	45.78	45.78	45.78	45.78
2048	46.63	46.63	46.63	46.63	46.63	46.63	46.63	46.63	46.63	46.63	46.63	46.63
2049	47.75	47.75	47.75	47.75	47.75	47.75	47.75	47.75	47.75	47.75	47.75	47.75

Portland General Electric
Renewable Avoided Cost Study
Deficiency Period: Full Wind Cost - Value of Wind Capacity, Flat $/MWh

Table R.9 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024					-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30
2027	17.67	17.67	17.67	17.67	17.67	17.67	17.67	17.67	17.67	17.67	17.67	17.67
2028	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
2029	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43	18.43
2030	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83	18.83
2031	19.23	19.23	19.23	19.23	19.23	19.23	19.23	19.23	19.23	19.23	19.23	19.23
2032	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58
2033	20.06	20.06	20.06	20.06	20.06	20.06	20.06	20.06	20.06	20.06	20.06	20.06
2034	20.48	20.48	20.48	20.48	20.48	20.48	20.48	20.48	20.48	20.48	20.48	20.48
2035	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92	20.92
2036	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31
2037	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82
2038	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29
2039	22.76	22.76	22.76	22.76	22.76	22.76	22.76	22.76	22.76	22.76	22.76	22.76
2040	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19
2041	23.75	23.75	23.75	23.75	23.75	23.75	23.75	23.75	23.75	23.75	23.75	23.75
2042	24.25	24.25	24.25	24.25	24.25	24.25	24.25	24.25	24.25	24.25	24.25	24.25
2043	24.77	24.77	24.77	24.77	24.77	24.77	24.77	24.77	24.77	24.77	24.77	24.77
2044	25.23	25.23	25.23	25.23	25.23	25.23	25.23	25.23	25.23	25.23	25.23	25.23
2045	25.84	25.84	25.84	25.84	25.84	25.84	25.84	25.84	25.84	25.84	25.84	25.84
2046	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39
2047	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95
2048	27.45	27.45	27.45	27.45	27.45	27.45	27.45	27.45	27.45	27.45	27.45	27.45
2049	28.11	28.11	28.11	28.11	28.11	28.11	28.11	28.11	28.11	28.11	28.11	28.11

Portland General Electric
Renewable Avoided Cost Study
Flat Energy, Solar + Storage

Table R.10 Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	252.49	89.64	73.30	70.75	57.48	72.79	149.87	208.07	158.04	82.49	97.81	139.67	
2025	143.23	121.55	85.52	66.89	56.31	58.39	143.39	184.52	149.55	92.04	102.42	119.54	110.41
2026	14.46	14.46	14.46	14.46	14.46	14.46	14.46	14.46	14.46	14.46	14.46	14.46	14.46
2027	14.77	14.77	14.77	14.77	14.77	14.77	14.77	14.77	14.77	14.77	14.77	14.77	14.77
2028	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04
2029	15.41	15.41	15.41	15.41	15.41	15.41	15.41	15.41	15.41	15.41	15.41	15.41	15.41
2030	15.53	15.53	15.53	15.53	15.53	15.53	15.53	15.53	15.53	15.53	15.53	15.53	15.53
2031	15.86	15.86	15.86	15.86	15.86	15.86	15.86	15.86	15.86	15.86	15.86	15.86	15.86
2032	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14
2033	16.54	16.54	16.54	16.54	16.54	16.54	16.54	16.54	16.54	16.54	16.54	16.54	16.54
2034	16.89	16.89	16.89	16.89	16.89	16.89	16.89	16.89	16.89	16.89	16.89	16.89	16.89
2035	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25	17.25
2036	17.56	17.56	17.56	17.56	17.56	17.56	17.56	17.56	17.56	17.56	17.56	17.56	17.56
2037	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
2038	18.38	18.38	18.38	18.38	18.38	18.38	18.38	18.38	18.38	18.38	18.38	18.38	18.38
2039	18.77	18.77	18.77	18.77	18.77	18.77	18.77	18.77	18.77	18.77	18.77	18.77	18.77
2040	19.11	19.11	19.11	19.11	19.11	19.11	19.11	19.11	19.11	19.11	19.11	19.11	19.11
2041	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58	19.58
2042	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
2043	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43
2044	20.80	20.80	20.80	20.80	20.80	20.80	20.80	20.80	20.80	20.80	20.80	20.80	20.80
2045	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31	21.31
2046	21.76	21.76	21.76	21.76	21.76	21.76	21.76	21.76	21.76	21.76	21.76	21.76	21.76
2047	22.23	22.23	22.23	22.23	22.23	22.23	22.23	22.23	22.23	22.23	22.23	22.23	22.23
2048	22.63	22.63	22.63	22.63	22.63	22.63	22.63	22.63	22.63	22.63	22.63	22.63	22.63
2049	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19	23.19

Capacity Removed, No Shaping, Integration Removed

Renewable Capacity Tables

Portland General Electric
Renewable Avoided Cost Study
On-Peak Capacity, Base Load

Table R10.a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60	41.60
2027	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49	42.49
2028	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39	43.39
2029	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32	44.32
2030	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26	45.26
2031	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23	46.23
2032	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92	46.92
2033	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22	48.22
2034	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41	49.41
2035	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30	50.30
2036	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21	51.21
2037	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47
2038	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59	53.59
2039	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73	54.73
2040	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90	55.90
2041	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09	57.09
2042	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31	58.31
2043	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56	59.56
2044	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63	60.63
2045	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32	62.32
2046	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45	63.45
2047	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80	64.80
2048	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97	65.97
2049	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60	67.60

Portland General Electric
Renewable Avoided Cost Study
Off-Peak Capacity, Base Load

Table R.10b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Renewable Avoided Cost Study
On-Peak Capacity, Wind

Table R.11a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22
2027	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65	20.65
2028	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09	21.09
2029	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54	21.54
2030	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
2031	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47	22.47
2032	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80	22.80
2033	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44	23.44
2034	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02
2035	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45	24.45
2036	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89
2037	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50	25.50
2038	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05	26.05
2039	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60	26.60
2040	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17	27.17
2041	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75	27.75
2042	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34	28.34
2043	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95	28.95
2044	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47
2045	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29	30.29
2046	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84	30.84
2047	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50
2048	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07	32.07
2049	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86	32.86

Portland General Electric
Renewable Avoided Cost Study
Off-Peak Capacity, Wind

Table R.11b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Renewable Avoided Cost Study
On-Peak Capacity, Solar

Table R.12a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58	32.58
2027	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28	33.28
2028	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99	33.99
2029	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71	34.71
2030	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45	35.45
2031	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21	36.21
2032	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74
2033	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77	37.77
2034	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70	38.70
2035	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40	39.40
2036	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11	40.11
2037	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10	41.10
2038	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97	41.97
2039	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87	42.87
2040	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78	43.78
2041	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72	44.72
2042	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67
2043	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64	46.64
2044	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49	47.49
2045	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81	48.81
2046	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69	49.69
2047	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75	50.75
2048	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67	51.67
2049	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94

Portland General Electric
Renewable Avoided Cost Study
Off-Peak Capacity, Solar

Table R.12b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

Portland General Electric
Avoided Cost Study
On Peak Capacity, Solar + Storage

Table R.13a Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11	72.11
2027	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65	73.65
2028	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22	75.22
2029	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07	77.07
2030	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47	78.47
2031	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14	80.14
2032	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85	81.85
2033	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60	83.60
2034	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65	85.65
2035	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20	87.20
2036	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06
2037	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96	90.96
2038	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90	92.90
2039	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88	94.88
2040	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22	97.22
2041	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98	98.98
2042	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09	101.09
2043	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24	103.24
2044	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45	105.45
2045	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04	108.04
2046	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99	109.99
2047	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34	112.34
2048	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74	114.74
2049	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18	117.18

Avoided Cost Study
Off Peak Capacity, Solar + Storage

Table R.13b Nominal $/MWh

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-	-

UM 1728

Application to Update Schedule 201
Avoided Cost Power Purchase Information

Attachment C
Filing Inputs

Worksheet Tab: Plant Capital Cost Inputs

	3/18/24 Filing				4/28/23 Filing	
	Value	**Units**	**$ Year**	**Source**	**Value**	**$ Year**
Simple Cycle Combustion Thermal Plant Equipment (1x0 GE 7HA.02)						
Clean Capacity	233	MW		2023 IRP - Supply-Side Resource Study - 2022	356	
Degraded Capacity	227	MW		2023 IRP - Table 35 - 2026 COD SCCT and CCCT	347	
Overnight capital cost	159,897	($000s)	2022	calculation. 2023 IRP revenue requirement model	181,044	2018
CO2 offset	3,056	($000s)	2017	2023 IRP revenue requirement model	3,674	2017
Economic life	38	yrs.		no change	38	
Tax life	15	yrs.		no change	15	
Decommissioning cost	1,605	($000s)	2022	2023 IRP revenue requirement model	1,533	2018
In-service date	2026			check order for reference to in-service date	2025	
Start construction date	2024				2023	
EPC period	22	months		2023 IRP - Supply-Side Resource Study - 2022	20	
Capacity contribution	95.9%	%		2023 IRP Update. Table 169. Summary of SCCT operatio	95.5%	
Interconnection Facilities	12,664	($000s)	2013	2023 IRP revenue requirement model	6,160	2013
Interconnection Facilities	16,564	($000s)	2023	Calculation	6,639	2018
Network Upgrades	4,932	($000s)	2013	2023 IRP revenue requirement model	3,556	2013
Network Upgrades	6,450	($000s)	2023	Calculation	3,833	2018
Interconnection and Network Upgrades	23,015	($000s)	2023	Calculation	10,473	2018
Combined Cycle Combustion Thermal Plant Equipment (1x1 GE 7HA.02)						
Clean Capacity	418	MW		2023 IRP - Supply-Side Resource Study - 2022	517	
Degraded Capacity	407	MW		2023 IRP - Table 172. Summary of CCCT operational cha	503	
Overnight capital cost	506,261	($000s)	2022	calculation. Table 35. 2026 COD SCCT and CCCT	459,128	2018
CO2 offset	10,710	($000s)	2017	2023 IRP revenue requirement model	9,277	2017
Economic life	38	yrs.		no change	38	
Tax life	20			no change	20	
Decomissioning cost	2,915	($000s)	2022	2023 IRP revenue requirement model	2,450	2018
In-service date	2026				2025	
Start construction date	2024				2022	
EPC period	22	months		2023 IRP - Supply-Side Resource Study - 2022	30	
Interconnection Facilities	5,618	($000s)	2013	2023 IRP revenue requirement model	8,313	2013
Interconnection Facilities	7,348	($000s)	2023	Calculation	8,961	2018
Network Upgrades	4,932	($000s)	2013	2023 IRP revenue requirement model	3,556	2013
Network Upgrades	6,450	($000s)	2023	Calculation	3,833	2018
Interconnection and Network Upgrades	13,798	($000s)	2023	Calculation	12,794	2018

Wind Equipment (Gorge wind):							
	Capacity	300	MW		2023 IRP - Table 28. 2026 COD onshore wind	245	
	Turbines	87	turbines		2023 IRP - page 585	68	
	Overnight capital cost	405,226	($000s)	2022	2023 IRP revenue requirement model	369,222	2018
	Annual capital reinvestment		$s/MW				
	PTC application	100%				100%	
	Economic life	30			no change	30	
	Tax life	5			no change	5	
	Decommissioning cost	9,984	($000s)	2022	2023 IRP revenue requirement model	8,428	2018
	In-service date	2026				2025	
	Start construction date	2024				2027	
	EPC period	21	months		2023 IRP revenue requirement model	27	
	Plant retirement						
	Capacity contribution	24.0%	%		Tuned ELCC values UM1728	25.0%	
	Interconnection Facilities	16,779	($000s)	2013	2023 IRP revenue requirement model	15,061	2013
	Interconnection Facilities	21,947	($000s)	2023	Calculation	16,234	2018
	Network Upgrades	4,932	($000s)	2013	2023 IRP revenue requirement model	3,556	2013
	Network Upgrades	6,450	($000s)	2023	Calculation	3,833	2018
	Interconnection and Network Upgrades	28,397	($000s)	2023	Calculation	20,067	2018
4 Hour Lithium-Ion Battery							
	Clean Capacity	50	MW		2023 IRP revenue requirement model		
	Degraded Capacity	50	MW				
	Overnight capital cost	50,880	($000s)	2022	2023 IRP revenue requirement model		
	CO2 offset	-	($000s)	0	Eliminated with battery		
	Economic life	20	yrs.		2023 IRP revenue requirement model		
	Tax life	7	yrs.		2023 IRP revenue requirement model		
	Final Year Decom Cost	590	($000s)		2023 IRP revenue requirement model		
	Decommissioning cost	363	($000s)	2022	2023 IRP revenue requirement model		
	In-service date	2026					
	Start construction date	2024			2023 IRP revenue requirement model		
	EPC period	18	months		2023 IRP revenue requirement model		
	Capacity contribution	42%	%		Tuned ELCC values UM1728		
	Interconnection and Network Upgrades	6,121	($000s)	2022			

Workbook Tab: Plant Operating Parameters						
	3/18/24 Filing				4/28/23 Filing	
	Value	**Units**	**$ Year**	**Source**	**Value**	**$ Year**
Simple Cycle Combustion Thermal Plant Equipment (1x0 GE 7HA.02)						
Heat Rate (avg over life)	10,042	Btu/kWh	2,023	2023 IRP - Table 35 - 2026 COD SCCT and CCCT	9,298	
Fixed O&M	7.92	$/kW-yr	2022	2023 IRP - Supply-Side Resource Study - 2022	2.10	2018
Variable O&M	0.68	$/MWh	2022	2023 IRP - Supply-Side Resource Study - 2022	9.69	2018
Insurance	0.17	$/100 project cost	2024	2023 IRP - Supply-Side Resource Study - 2022	0.17	2023
Materials inventory	2.49	$/kW degraded	2019	2023 IRP - Supply-Side Resource Study - 2022	4.90	2018
Net Energy Value	56.82	$/kW-yr	2026	2023 IRP Update AURORA model	0.39	2020
Flexibility value	4.82	$/kW-yr	2020	2019 IRP table 6-5 (Gas resources were not included fo	4.82	2020
Contingency reserves (%)	-	%				
Spinning reserves	-	$/MWh				
Supplemental reserves	-	$/MWh				
Contingency reserves cost	-	$/MWh				
Availability factor	-	%				
Ancillary services cost	-					
Combined Cycle Combustion Thermal Plant Equipment (1x1 GE 7HA.02)						
Heat Rate (avg over life)	6,561	Btu/kWh	2,023	2023 IRP - Table 172. Summary of CCCT operational cha	6,362	
Fixed O&M	15.95	$/kW-yr	2022	2023 IRP - Supply-Side Resource Study - 2022	6.57	2018
Variable O&M	2.88	$/MWh	2022	2023 IRP - Supply-Side Resource Study - 2022	0.72	2018
Insurance	0.17	$/100 project cost	2024	2023 IRP - Supply-Side Resource Study - 2022	0.17	2022
Materials inventory	2.49	$/kW degraded	2019	2023 IRP - Supply-Side Resource Study - 2022	2.49	2018
Availability factor	94.01%	%		2023 IRP - Supply-Side Resource Study - 2022	94.01%	
Contingency reserves (%)	-	%				
Spinning reserves	-	$/MWh				
Supplemental reserves	-	$/MWh				
Contingency reserves cost	-	$/MWh				
Schedule outage rate	3.88%	%	2023	2023 IRP - Table 172. Summary of CCCT operational characteristics		
Gorge Wind						
Fixed O&M	25.25	$/kW-yr	2022	2023 IRP - Supply-Side Resource Study - 2022	37.00	2018
Capacity factor (flat)	44.40%			2023 IRP - Table 28. 2026 COD onshore wind	40.80%	
Capacity factor (peak)	46.42%			CFs_SolarWind.xlsx	39.97%	
Annual output	1,166,832	MWh				
Land royalties	1.92	$/MWh	2022	2023 IRP - Supply-Side Resource Study - 2022	1.70	2018
Insurance	0.08	$/100 project cost	2024		0.08	0
Capacity contribution	24.00%			Tuned ELCC values UM1728	25.00%	
Spinning reserves	-	%				
Contingency reserves cost	-					

4 Hour Lithium-Ion Battery						
Fixed O&M	24.86	$/kW-yr	2022	2023 IRP revenue requirement model (2026 COD)		
Variable O&M	-	$/MWh		2023 IRP revenue requirement model		
Insurance	0.15	$/100 project cost	2024	2023 IRP revenue requirement model		
Energy Value	8.98	$/kW-yr	2023	New resource economics workbook - Tab: Aurora_2023IRP)2026COD)		
Flexibility value	9.77	$/kW-yr	2023	Table 47. Flexibility value ($/kW-yr.) of new resources in 2026		
Solar						
Capacity factor (peak)	39.61%			CFs_SolarWind.xlsx	36.87%	
Capacity contribution	33.00%			Tuned ELCC values UM1728	8.50%	
BPA line loss	2.05%			https://www.bpa.gov/-/media/Aep/transmission/ope	1.90%	
Workboook Tab: Financial and Tax Parameters						
				3/18/24 Filing	4/28/23 Filing	
	Value			**Source**	**Value**	
Federal Tax Rate	21.00%			2023 IRP revenue requirement model		
State Tax Rate	8.23%			2023 IRP revenue requirement model		
Composite Income Tax Rate	27.50%			2023 IRP - Appendix H Table 127	27.35%	
Debt Portion of Capitalization	50.00%			2023 IRP - Appendix H Table 127	50.00%	
Common Stock Portion of Capitalization	50.00%			2023 IRP - Appendix H Table 127	50.00%	
Property Tax Rate	1.50%			2023 IRP revenue requirement model	1.45%	
Inflation Rate	2.13%			2023 IRP - Appendix H Table 127	2.05%	
Common Return	9.50%			2023 IRP - Appendix H Table 127	9.50%	
Debt Return	3.91%			2023 IRP - Appendix H Table 127	4.94%	
Pre-Tax Nominal Cost of Capital	6.71%			calculation	4.75%	
Equity portion	70.84%			calculation	65.79%	
After-Tax Nominal Cost of Capital	6.17%			calculation	6.54%	
After-Tax Real Cost of Capital	3.95%			calculation	4.41%	

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused **Portland General Electric Company's CONFIDENTIAL Attachment A and Work Papers** to be served by electronic mail to those parties whose e-mail addresses appear on the attached service list for OPUC Docket UM 1728.

Dated at Portland, Oregon, this 18st day of March, 2024.

/s/ *Robert Macfarlane*

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