



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

March 12, 2019

Public Utility Commission of Oregon  
Attn: Filing Center  
201 High Street S.E., Suite 100  
P.O. Box 1088  
Salem, OR 97308-1088

RE: UM 2001 PGE's Enhanced Update to Schedule 201 Avoided Cost Prices

Pursuant to Order No. 19-074, Portland General Electric Company (PGE) submits updated pricing pages for its Schedule 201, Qualifying Facility Power Purchase Information for Qualifying Facilities (QF) sized at 10 MW or less (3 MW or less for Solar QFs).

In Order No. 19-074, the Commission directed electric utilities to file enhanced updated avoided cost prices based on the following factors:

1. Capital costs of the avoided resources (SCCT, CCCT, and wind);
2. Fixed operations and maintenance (O&M) costs;
3. Capacity factors of the avoided renewable resources (wind);
4. Updated forward electricity prices;
5. Updated natural gas prices;
6. Changes to the status of the Production Tax Credit (PTC); and
7. Updates to the solar capacity contribution percentage (PGE only<sup>1</sup>).

This filing incorporates updates to six of the seven factors listed above. It does not include updates to the sixth factor, as there have been no changes to the status of the PTC since the last avoided cost filings. The updates contained in this filing were determined as follows:

1. *Updated capital costs:* these costs are based on the supply-side studies prepared for PGE's 2019 IRP. The capital costs for gas and wind resources are reflected in this filing.
2. *Updated fixed O&M:* these costs are based on the supply-side studies prepared for PGE's 2019 IRP. The fixed O&M costs for gas and wind resources are reflected in this filing.

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<sup>1</sup> Staff supports updating the solar capacity contribution in Order No. 19-074 at 5.

3. *Updated wind capacity factor*: based on the wind capacity factor developed in the renewable supply-side study prepared for PGE's 2019 IRP.
4. *On-and off-peak forward-looking electricity market prices*: these prices were updated and incorporated into avoided cost prices consistent with the current source and methodology.
5. *Updated natural gas prices*: these prices apply only to the Standard Fixed Price Option (i.e., non-renewable projects). For this filing they were updated and incorporated into avoided cost prices consistent with the current source and methodology.
6. *Changes to the status of the PTC*: no change from current policy.
7. *Updated solar capacity contribution*: based on the method in PGE's 2016 IRP Update (decreasing capacity value as penetration levels increase) and updated for recently executed QF contracts.

PGE has provided detailed summaries of the updated avoided cost prices in Attachments A and B. Attachment C provides a summary of the inputs and assumptions. PGE is also providing work papers with this filing.

Should you have any questions or comments regarding this filing, please contact Colin Wright at (503) 464-8011. Please direct all formal correspondence and requests to the following email address [pge.opuc.filings@pgn.com](mailto:pge.opuc.filings@pgn.com)

Sincerely,

  
for Karla Wenzel  
Manager, Pricing and Tariffs

Enclosures

cc: Service List – UM 2001

**SCHEDULE 201  
QUALIFYING FACILITY 10 MW or LESS  
AVOIDED COST POWER PURCHASE INFORMATION**

**PURPOSE**

To provide information about Standard Avoided Costs and Renewable Avoided Costs, Standard Power Purchase Agreements (PPA) and Negotiated PPAs, power purchase prices and price options for power delivered by a Qualifying Facility (QF) to the Company with nameplate capacity of 10,000 kW (10MW) or less.

**AVAILABLE**

To owners of QFs making sales of electricity to the Company in the State of Oregon (Seller).

**APPLICABLE**

For power purchased from small power production or cogeneration facilities that are QFs as defined in 18 Code of Federal Regulations (CFR) Section 292, that meet the eligibility requirements described herein and where the energy is delivered to the Company's system and made available for Company purchase pursuant to a Standard PPA.

**ESTABLISHING CREDITWORTHINESS**

The Seller must establish creditworthiness prior to service under this schedule. For a Standard PPA, a Seller may establish creditworthiness with a written acknowledgment that it is current on all existing debt obligations and that it was not a debtor in a bankruptcy proceeding within the preceding 24 months. If the Seller is not able to establish creditworthiness, the Seller must provide security deemed sufficient by the Company as set forth in the Standard PPA.

**POWER PURCHASE INFORMATION**

A Seller may call the Power Production Coordinator at (503) 464-8000 to obtain more information about being a Seller or how to apply for service under this schedule.

**PPA**

In accordance with terms set forth in this schedule and the Commission's Rules as applicable, the Company will purchase any Energy in excess of station service (power necessary to produce generation) and amounts attributable to conversion losses, which are made available from the Seller.

A Seller must execute a PPA with the Company prior to delivery of power to the Company. The agreement will have a term of up to 20 years as selected by the QF and memorialized in the PPA.

A QF with a nameplate capacity rating of 10 MW or less as defined herein may elect the option of a Standard PPA.

**SCHEDULE 201 (Continued)**

## PPA (Continued)

Any Seller may elect to negotiate a PPA with the Company. Such negotiation will comply with the requirements of the Federal Energy Regulatory Commission (FERC), and the Commission including the guidelines in Order No. 07-360, and Schedule 202. Negotiations for power purchase pricing will be based on either the filed Standard Avoided Costs or Renewable Avoided Costs in effect at that time.

**STANDARD PPA (Nameplate capacity of 10 MW or less)**

A Seller choosing a Standard PPA will complete all informational and price option selection requirements in the applicable Standard PPA and submit the executed Agreement to the Company prior to service under this schedule. The Standard PPA is available at [www.portlandgeneral.com](http://www.portlandgeneral.com). The available Standard PPAs are:

- Standard In-System Non-Variable Power Purchase Agreement
- Standard Off-System Non-Variable Power Purchase Agreement
- Standard In-System Variable Power Purchase Agreement
- Standard Off-System Variable Power Purchase Agreement
- Standard Renewable In-System Non-Variable Power Purchase Agreement
- Standard Renewable Off-System Non-Variable Power Purchase Agreement
- Standard Renewable In-System Variable Power Purchase Agreement
- Standard Renewable Off-System Variable Power Purchase Agreement

The Standard PPAs applicable to variable resources are available only to QFs utilizing wind, solar or run of river hydro as the primary motive force.

**GUIDELINES FOR 10 MW OR LESS FACILITIES ELECTING STANDARD PPA**

To execute the Standard PPA the Seller must complete all of the general project information requested in the applicable Standard PPA.

When all information required in the Standard PPA has been received in writing from the Seller, the Company will respond within 15 business days with a draft Standard PPA.

The Seller may request in writing that the Company prepare a final draft Standard PPA. The Company will respond to this request within 15 business days. In connection with such request, the QF must provide the Company with any additional or clarified project information that the Company reasonably determines to be necessary for the preparation of a final draft Standard PPA.

When both parties are in full agreement as to all terms and conditions of the draft Standard PPA, the Company will prepare and forward to the Seller a final executable version of the agreement within 15 business days. Following the Company's execution, an executed copy will be returned to the Seller. Prices and other terms and conditions in the PPA will not be final and binding until the Standard PPA has been executed by both parties.

**SCHEDULE 201 (Continued)****OFF-SYSTEM PPA**

A Seller with a facility that interconnects with an electric system other than the Company's electric system may enter into a PPA with the Company after following the applicable Standard or Negotiated PPA guidelines and making the arrangements necessary for transmission of power to the Company's system.

**BASIS FOR POWER PURCHASE PRICE****AVOIDED COST SUMMARY**

The power purchase prices are based on either the Company's Standard Avoided Costs or Renewable Avoided Costs in effect at the time the agreement is executed. Avoided Costs are defined in 18 CFR 292.101(6) as "the incremental costs to an electric utility of electric energy or capacity or both which, but for the purchase from the qualifying facility or qualifying facilities, such utility would generate itself or purchase from another source."

Monthly On-Peak prices are included in both the Standard Avoided Costs as listed in Tables 1a, 2a, and 3a and Renewable Avoided Costs as listed in Tables 4a, 5a, and 6a. Monthly Off-Peak prices are included in both the Standard Avoided Costs as listed in Tables 1b, 2b, and 3b and Renewable Avoided Costs as listed in Tables 4b, 5b, and 6b.

**ON-PEAK PERIOD**

The On-Peak period is 6:00 a.m. until 10:00 p.m., Monday through Saturday.

**OFF-PEAK PERIOD**

The Off-Peak period is 10:00 p.m. until 6:00 a.m., Monday through Saturday, and all day on Sunday.

Standard Avoided Costs are based on forward market price estimates through the Resource Sufficiency Period, the period of time during which the Company's Standard Avoided Costs are associated with incremental purchases of Energy and capacity from the market. For the Resource Deficiency Period, the Standard Avoided Costs reflect the fully allocated costs of a natural gas fueled combined cycle combustion turbine (CCCT) including fuel and capital costs. The CCCT Avoided Costs are based on the variable cost of Energy plus capitalized Energy costs at a 93% capacity factor based on a natural gas price forecast, with prices modified for shrinkage and transportation costs.

Renewable Avoided Costs are based on forward market price estimates through the Renewable Resource Sufficiency Period, the period of time during which the Company's Renewable Avoided Costs are associated with incremental purchases of energy and capacity from the market. For the Renewable Resource Deficiency Period, the Renewable Avoided Costs reflect the fully allocated costs of a wind plant including capital costs.

**SCHEDULE 201 (Continued)****PRICING FOR STANDARD PPA**

Pricing represents the purchase price per MWh the Company will pay for electricity delivered to a Point of Delivery (POD) within the Company's service territory pursuant to a Standard PPA up to the nameplate rating of the QF in any hour. Any Energy delivered in excess of the nameplate rating will be purchased at the applicable Off-Peak Prices for the selected pricing option.

**ELIGIBILITY REQUIREMENTS TO RECEIVE THE STANDARD FIXED PRICE OPTION OR THE RENEWABLE FIXED PRICE OPTION**

The Standard PPA pricing will be based on either the Standard or Renewable Avoided Costs in effect at the time the agreement is executed. A QF will be eligible to receive either the Standard Fixed Price Option or the Renewable Fixed Price Option described below only if the nameplate capacity of the QF does not exceed 3 MW for solar QF projects or 10 MW for all other types of QF projects. A QF that does not meet these eligibility requirements must negotiate prices pursuant to the terms of Schedule 202. Solar QF projects with nameplate capacity that exceed 3 MW but do not exceed 10 MW are eligible for a Standard PPA containing negotiated prices under Schedule 202. Eligibility for the Standard Fixed Price Option or the Renewable Fixed Price Option may also be affected by the Definition of a Small Cogeneration Facility or Small Power Production Facility Eligible to Receive the Standard Fixed Price Option or the Renewable Fixed Price Option Under the Standard PPA stated below.

The Company will pay the Seller either the Off-Peak Standard Avoided Cost pursuant to Tables 1b, 2b, or 3b or the Off-Peak Renewable Avoided Costs pursuant to Tables 4b, 5b, or 6b for: (a) all Net Output delivered prior to the Commercial Operation Date; (b) all Net Output deliveries greater than Maximum Net Output in any PPA year; (c) any generation subject to and as adjusted by the provisions of Section 4.3 of the Standard PPA; (d) Net Output delivered in the Off-Peak Period; and (e) deliveries above the nameplate capacity in any hour. The Company will pay the Seller either the On-Peak Standard Avoided Cost pursuant to Tables 1a, 2a, or 3a or the On-Peak Renewable Avoided Costs pursuant to Tables 4a, 5a, or 6a for all other Net Output. (See the PPA for defined terms.)

**1) Standard Fixed Price Option**

The Standard Fixed Price Option is based on Standard Avoided Costs including forecasted natural gas prices. It is available to all QFs that meet the eligibility requirements identified above.

This option is available for a maximum term of 15 years. Prices will be as established at the time the Standard PPA is executed and will be equal to the Standard Avoided Costs in Tables 1a and 1b, 2a and 2b, or 3a and 3c, depending on the type of QF, effective at execution. QFs using any resource type other than wind and solar are assumed to be Base Load QFs.

Prices paid to the Seller under the Standard Fixed Price Option include adjustments for the capacity contribution of the QF resource type relative to that of

**SCHEDULE 201 (Continued)**

**PRICING OPTIONS FOR STANDARD PPA (Continued)**

**Standard Fixed Price Option (Continued)**

the avoided proxy resource. Both the Base Load QF resources (Tables 1a and 1b) and the avoided proxy resource, the basis used to determine Standard Avoided Costs for the Standard Fixed Price Option, are assumed to have a capacity contribution to peak of 100%. The capacity contribution for Wind QF resources (Tables 2a and 2b) is assumed to be 18.59%. The capacity contribution for Solar QF resources (Tables 3a and 3b) is assumed to be 15.33%.

Prices paid to the Seller under the Standard Fixed Price Option for Wind QFs (Tables 2a and 2b) include a reduction for the wind integration costs in Table 7. However, if the Wind QF is outside of PGE's Balancing Authority Area as contemplated in the Commission's Order No. 14-058, the Seller is paid the wind integration charges in Table 7, in addition to the prices listed in Tables 2a and 2b, for a net-zero effect.

Sellers with terms exceeding 15 years from the commercial operation date will receive pricing equal to the Mid-C Index Price for all years up to five in excess of the initial 15 years after the commercial operation date selected by the Seller and memorialized in the PPA.

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Standard Fixed Price Option (Continued)

TABLE 1a												
Avoided Costs												
Fixed Price Option for Base Load QF												
On-Peak Forecast (\$/MWH)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49
2020	38.74	35.53	26.79	22.36	21.63	27.26	51.38	60.63	42.57	29.58	30.04	36.10
2021	43.58	43.21	42.22	40.60	40.42	40.67	40.93	41.03	41.00	41.17	42.90	44.05
2022	45.57	45.21	44.58	42.19	42.04	42.23	42.44	42.52	42.46	42.63	44.38	45.38
2023	46.97	46.64	46.09	44.53	44.45	44.69	44.94	45.07	45.11	45.31	46.13	47.13
2024	47.27	47.33	47.39	46.87	46.96	47.03	47.09	47.16	47.22	47.29	48.27	48.34
2025	49.62	49.69	49.76	48.88	48.95	48.96	49.03	49.10	49.17	49.24	50.15	50.23
2026	51.33	51.10	51.14	50.26	50.33	50.41	50.48	50.55	50.63	50.71	51.77	51.85
2027	52.98	52.97	52.14	51.21	51.29	51.20	51.27	51.35	51.42	51.59	52.51	52.59
2028	53.70	53.16	52.93	51.99	52.06	52.14	52.22	52.30	52.37	52.48	53.56	53.64
2029	54.88	54.96	55.00	54.06	54.14	54.23	55.33	55.43	55.52	55.77	56.91	57.01
2030	58.38	58.48	58.37	57.33	57.42	57.52	57.62	57.72	57.82	57.98	59.24	59.34
2031	60.68	60.79	60.58	59.33	59.44	59.54	59.64	59.75	59.86	60.22	61.57	61.68
2032	62.84	62.96	62.73	61.59	61.70	61.82	61.93	62.05	62.17	62.64	64.05	64.17
2033	65.86	65.99	66.03	64.83	64.95	65.08	65.20	65.33	65.46	65.82	68.07	68.20
2034	69.86	70.00	70.14	68.86	69.00	69.14	69.28	69.43	69.58	70.34	73.32	73.92
2035	75.49	75.66	75.81	74.40	74.57	74.75	74.92	75.09	75.27	76.14	77.63	77.81
2036	79.47	79.64	78.43	76.97	77.15	77.33	77.51	77.70	77.89	78.93	80.75	80.94
2037	82.93	83.14	82.18	80.64	80.84	81.04	81.23	81.43	81.64	82.97	85.00	85.21
2038	87.18	87.41	86.53	84.90	85.11	85.33	85.55	85.77	85.99	87.13	89.20	89.43
2039	91.50	91.73	89.28	87.60	87.82	88.05	88.28	88.51	88.75	89.97	92.08	92.33
2040	95.48	94.47	93.00	91.26	91.49	91.73	91.97	92.21	92.45	93.37	94.96	95.21
2041	97.47	96.43	94.93	93.16	93.40	93.64	93.88	94.13	94.38	95.32	96.94	97.19
2042	99.48	98.43	96.90	95.09	95.33	95.58	95.83	96.08	96.33	97.29	98.95	99.21
2043	101.54	100.47	98.91	97.06	97.31	97.56	97.81	98.07	98.33	99.31	101.00	101.26
2044	103.52	102.42	100.82	98.94	99.19	99.45	99.71	99.97	100.24	101.23	102.96	103.23



## SCHEDULE 201 (Continued)

PRICING OPTIONS FOR STANDARD PPA (Continued)  
Standard Fixed Price Option (Continued)

TABLE 1b												
Avoided Costs												
Fixed Price Option for Base Load QF												
Off-Peak Forecast (\$/MWH)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11
2021	17.16	16.80	15.80	14.18	14.00	14.25	14.51	14.61	14.59	14.75	16.48	17.63
2022	18.62	18.26	17.64	15.25	15.10	15.29	15.50	15.57	15.52	15.69	17.43	18.43
2023	19.40	19.07	18.51	16.96	16.88	17.12	17.37	17.50	17.54	17.74	18.56	19.56
2024	19.33	19.39	19.45	18.93	19.02	19.08	19.15	19.21	19.28	19.35	20.33	20.40
2025	21.03	21.10	21.16	20.29	20.35	20.37	20.44	20.51	20.58	20.65	21.56	21.63
2026	22.17	21.94	21.97	21.10	21.17	21.24	21.31	21.39	21.47	21.54	22.61	22.69
2027	23.23	23.22	22.39	21.47	21.54	21.45	21.52	21.60	21.68	21.84	22.77	22.84
2028	23.36	22.82	22.59	21.65	21.72	21.80	21.88	21.95	22.03	22.14	23.22	23.30
2029	23.93	24.01	24.06	23.11	23.19	23.28	24.39	24.48	24.57	24.82	25.97	26.06
2030	26.81	26.91	26.81	25.76	25.86	25.96	26.05	26.15	26.25	26.42	27.67	27.78
2031	28.48	28.59	28.38	27.14	27.24	27.34	27.45	27.55	27.66	28.02	29.37	29.48
2032	30.21	30.33	30.10	28.96	29.07	29.19	29.30	29.42	29.53	30.01	31.42	31.54
2033	32.36	32.49	32.53	31.33	31.46	31.58	31.71	31.84	31.97	32.32	34.57	34.71
2034	35.58	35.73	35.86	34.58	34.72	34.87	35.01	35.16	35.31	36.06	39.05	39.65
2035	40.64	40.82	40.96	39.55	39.72	39.90	40.07	40.24	40.42	41.29	42.78	42.96
2036	44.04	44.21	43.00	41.54	41.72	41.90	42.08	42.27	42.46	43.49	45.32	45.51
2037	46.68	46.88	45.92	44.39	44.58	44.78	44.98	45.18	45.38	46.72	48.74	48.95
2038	50.20	50.43	49.55	47.92	48.13	48.35	48.57	48.79	49.01	50.15	52.22	52.45
2039	53.78	54.01	51.56	49.88	50.11	50.34	50.56	50.79	51.03	52.25	54.37	54.61
2040	57.01	55.99	54.52	52.79	53.02	53.26	53.49	53.74	53.98	54.90	56.49	56.74
2041	58.22	57.19	55.69	53.92	54.16	54.40	54.64	54.89	55.14	56.08	57.70	57.95
2042	59.46	58.40	56.87	55.07	55.31	55.56	55.80	56.05	56.31	57.27	58.92	59.18
2043	60.72	59.64	58.08	56.24	56.48	56.74	56.99	57.25	57.50	58.48	60.17	60.44
2044	62.01	60.91	59.31	57.44	57.69	57.95	58.20	58.46	58.73	59.73	61.45	61.72

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Standard Fixed Price Option (Continued)

TABLE 2a												
Avoided Costs												
Fixed Price Option for Wind QF												
On-Peak Forecast (\$/MWH)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	40.36	38.32	28.38	24.56	21.25	30.93	57.43	71.96	40.36	29.40	29.66	40.61
2020	37.84	34.63	25.89	21.46	20.73	26.36	50.48	59.73	41.67	28.68	29.14	35.20
2021	27.58	27.22	26.23	24.60	24.43	24.68	24.93	25.04	25.01	25.18	26.91	28.06
2022	29.25	28.89	28.27	25.88	25.73	25.92	26.13	26.20	26.15	26.32	28.06	29.06
2023	30.28	29.95	29.39	27.84	27.76	28.00	28.25	28.38	28.42	28.62	29.44	30.44
2024	30.35	30.41	30.47	29.95	30.04	30.10	30.17	30.23	30.30	30.36	31.35	31.41
2025	32.31	32.38	32.44	31.57	31.63	31.65	31.72	31.79	31.86	31.93	32.84	32.91
2026	33.67	33.44	33.48	32.60	32.67	32.74	32.82	32.89	32.97	33.05	34.11	34.19
2027	34.96	34.95	34.12	33.20	33.27	33.18	33.26	33.33	33.41	33.57	34.50	34.58
2028	35.33	34.79	34.56	33.62	33.69	33.77	33.85	33.92	34.00	34.11	35.19	35.27
2029	36.14	36.22	36.27	35.32	35.40	35.49	36.59	36.69	36.78	37.03	38.18	38.27
2030	39.27	39.37	39.26	38.22	38.31	38.41	38.51	38.61	38.71	38.87	40.13	40.23
2031	41.19	41.29	41.09	39.84	39.94	40.05	40.15	40.26	40.37	40.73	42.08	42.19
2032	43.08	43.20	42.97	41.83	41.94	42.06	42.17	42.29	42.41	42.88	44.29	44.41
2033	45.58	45.71	45.74	44.55	44.67	44.80	44.92	45.05	45.18	45.54	47.78	47.92
2034	49.11	49.26	49.39	48.11	48.25	48.40	48.54	48.69	48.83	49.59	52.57	53.17
2035	54.39	54.57	54.71	53.31	53.48	53.65	53.82	54.00	54.17	55.05	56.53	56.71
2036	58.01	58.19	56.97	55.51	55.69	55.88	56.06	56.24	56.43	57.47	59.29	59.49
2037	60.98	61.19	60.23	58.70	58.89	59.09	59.28	59.49	59.69	61.02	63.05	63.26
2038	64.79	65.02	64.14	62.51	62.72	62.94	63.16	63.38	63.60	64.74	66.81	67.04
2039	68.67	68.90	66.45	64.77	64.99	65.22	65.45	65.68	65.91	67.14	69.25	69.50
2040	72.19	71.17	69.70	67.97	68.20	68.44	68.67	68.92	69.16	70.08	71.67	71.92
2041	73.70	72.67	71.17	69.40	69.64	69.88	70.12	70.37	70.62	71.56	73.18	73.43
2042	75.26	74.20	72.67	70.87	71.11	71.36	71.60	71.85	72.11	73.06	74.72	74.98
2043	76.83	75.75	74.19	72.35	72.60	72.85	73.10	73.36	73.62	74.59	76.28	76.55
2044	78.38	77.28	75.69	73.81	74.06	74.32	74.57	74.84	75.10	76.10	77.82	78.09

## SCHEDULE 201 (Continued)

PRICING OPTIONS FOR STANDARD PPA (Continued)  
Standard Fixed Price Option (Continued)

TABLE 2b												
Avoided Costs												
Fixed Price Option for Wind QF												
Off-Peak Forecast (\$/MWH)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	36.79	32.46	23.29	19.21	13.86	15.89	27.87	35.01	30.68	25.32	26.09	32.46
2020	33.69	28.83	22.85	14.13	12.08	12.53	25.03	31.37	29.73	25.12	25.68	29.21
2021	16.24	15.88	14.88	13.26	13.08	13.33	13.59	13.69	13.67	13.83	15.56	16.71
2022	17.68	17.32	16.70	14.31	14.16	14.35	14.56	14.63	14.58	14.75	16.49	17.49
2023	18.44	18.11	17.55	16.00	15.92	16.16	16.41	16.54	16.58	16.78	17.60	18.60
2024	18.35	18.41	18.47	17.95	18.04	18.10	18.17	18.23	18.30	18.37	19.35	19.42
2025	20.03	20.10	20.16	19.29	19.35	19.37	19.44	19.51	19.58	19.65	20.56	20.63
2026	21.15	20.92	20.95	20.08	20.15	20.22	20.29	20.37	20.45	20.52	21.59	21.67
2027	22.19	22.18	21.35	20.43	20.50	20.41	20.48	20.56	20.64	20.80	21.73	21.80
2028	22.30	21.76	21.53	20.59	20.66	20.74	20.82	20.89	20.97	21.08	22.16	22.24
2029	22.85	22.93	22.98	22.03	22.11	22.20	23.31	23.40	23.49	23.74	24.89	24.98
2030	25.71	25.81	25.71	24.66	24.76	24.86	24.95	25.05	25.15	25.32	26.57	26.68
2031	27.36	27.47	27.26	26.02	26.12	26.22	26.33	26.43	26.54	26.90	28.25	28.36
2032	29.07	29.19	28.96	27.82	27.93	28.05	28.16	28.28	28.39	28.87	30.28	30.40
2033	31.19	31.32	31.36	30.16	30.29	30.41	30.54	30.67	30.80	31.15	33.40	33.54
2034	34.39	34.54	34.67	33.39	33.53	33.68	33.82	33.97	34.12	34.87	37.86	38.46
2035	39.43	39.61	39.75	38.34	38.51	38.69	38.86	39.03	39.21	40.08	41.57	41.75
2036	42.80	42.97	41.76	40.30	40.48	40.66	40.84	41.03	41.22	42.25	44.08	44.27
2037	45.42	45.62	44.66	43.13	43.32	43.52	43.72	43.92	44.12	45.46	47.48	47.69
2038	48.91	49.14	48.26	46.63	46.84	47.06	47.28	47.50	47.72	48.86	50.93	51.16
2039	52.47	52.70	50.25	48.57	48.80	49.03	49.25	49.48	49.72	50.94	53.06	53.30
2040	55.67	54.65	53.18	51.45	51.68	51.92	52.15	52.40	52.64	53.56	55.15	55.40
2041	56.85	55.82	54.32	52.55	52.79	53.03	53.27	53.52	53.77	54.71	56.33	56.58
2042	58.07	57.01	55.48	53.68	53.92	54.17	54.41	54.66	54.92	55.88	57.53	57.79
2043	59.30	58.22	56.66	54.82	55.06	55.32	55.57	55.83	56.08	57.06	58.75	59.02
2044	60.56	59.46	57.86	55.99	56.24	56.50	56.75	57.01	57.28	58.28	60.00	60.27

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Standard Fixed Price Option (Continued)

<b>TABLE 3a</b>												
<b>Avoided Costs</b>												
<b>Fixed Price Option for Solar QF</b>												
<b>On-Peak Forecast (\$/MWH)</b>												
<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49
2020	38.74	35.53	26.79	22.36	21.63	27.26	51.38	60.63	42.57	29.58	30.04	36.10
2021	24.67	24.31	23.32	21.69	21.52	21.77	22.02	22.13	22.10	22.27	24.00	25.15
2022	26.29	25.92	25.30	22.91	22.76	22.95	23.16	23.24	23.18	23.35	25.10	26.10
2023	27.24	26.92	26.36	24.80	24.72	24.96	25.21	25.34	25.38	25.58	26.40	27.40
2024	27.27	27.34	27.40	26.88	26.97	27.03	27.09	27.16	27.23	27.29	28.28	28.34
2025	29.16	29.23	29.30	28.42	28.49	28.50	28.57	28.64	28.71	28.78	29.69	29.77
2026	30.46	30.23	30.27	29.39	29.46	29.54	29.61	29.68	29.76	29.84	30.90	30.98
2027	31.69	31.68	30.85	29.93	30.00	29.91	29.98	30.06	30.14	30.30	31.23	31.30
2028	31.99	31.45	31.22	30.28	30.35	30.43	30.51	30.58	30.66	30.77	31.85	31.93
2029	32.73	32.82	32.86	31.91	32.00	32.08	33.19	33.28	33.37	33.62	34.77	34.86
2030	35.79	35.89	35.79	34.74	34.84	34.93	35.03	35.13	35.23	35.40	36.65	36.75
2031	37.64	37.75	37.54	36.30	36.40	36.50	36.60	36.71	36.82	37.18	38.53	38.64
2032	39.49	39.61	39.38	38.24	38.35	38.47	38.58	38.70	38.82	39.29	40.70	40.82
2033	41.89	42.02	42.06	40.86	40.98	41.11	41.24	41.36	41.49	41.85	44.10	44.23
2034	45.33	45.48	45.61	44.33	44.47	44.62	44.76	44.91	45.05	45.81	48.79	49.39
2035	50.55	50.73	50.87	49.47	49.63	49.81	49.98	50.15	50.33	51.21	52.69	52.87
2036	54.11	54.29	53.08	51.62	51.79	51.98	52.16	52.35	52.53	53.57	55.39	55.59
2037	56.99	57.19	56.23	54.70	54.89	55.09	55.29	55.49	55.69	57.03	59.05	59.27
2038	60.72	60.94	60.06	58.44	58.65	58.87	59.08	59.31	59.53	60.67	62.74	62.97
2039	64.51	64.74	62.29	60.61	60.83	61.06	61.29	61.52	61.76	62.98	65.09	65.34
2040	67.95	66.94	65.47	63.73	63.96	64.20	64.44	64.68	64.92	65.84	67.43	67.68
2041	69.39	68.35	66.85	65.08	65.32	65.56	65.80	66.05	66.30	67.24	68.86	69.11
2042	70.84	69.79	68.26	66.45	66.69	66.94	67.19	67.44	67.69	68.65	70.31	70.56
2043	72.33	71.26	69.69	67.85	68.10	68.35	68.60	68.86	69.12	70.09	71.78	72.05
2044	73.81	72.72	71.12	69.24	69.49	69.75	70.00	70.27	70.53	71.53	73.26	73.52

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Standard Fixed Price Option (Continued)

<b>TABLE 3b</b>												
<b>Avoided Costs</b>												
<b>Fixed Price Option for Solar QF</b>												
<b>Off-Peak Forecast (\$/MWH)</b>												
<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11
2021	17.16	16.80	15.80	14.18	14.00	14.25	14.51	14.61	14.59	14.75	16.48	17.63
2022	18.62	18.26	17.64	15.25	15.10	15.29	15.50	15.57	15.52	15.69	17.43	18.43
2023	19.40	19.07	18.51	16.96	16.88	17.12	17.37	17.50	17.54	17.74	18.56	19.56
2024	19.33	19.39	19.45	18.93	19.02	19.08	19.15	19.21	19.28	19.35	20.33	20.40
2025	21.03	21.10	21.16	20.29	20.35	20.37	20.44	20.51	20.58	20.65	21.56	21.63
2026	22.17	21.94	21.97	21.10	21.17	21.24	21.31	21.39	21.47	21.54	22.61	22.69
2027	23.23	23.22	22.39	21.47	21.54	21.45	21.52	21.60	21.68	21.84	22.77	22.84
2028	23.36	22.82	22.59	21.65	21.72	21.80	21.88	21.95	22.03	22.14	23.22	23.30
2029	23.93	24.01	24.06	23.11	23.19	23.28	24.39	24.48	24.57	24.82	25.97	26.06
2030	26.81	26.91	26.81	25.76	25.86	25.96	26.05	26.15	26.25	26.42	27.67	27.78
2031	28.48	28.59	28.38	27.14	27.24	27.34	27.45	27.55	27.66	28.02	29.37	29.48
2032	30.21	30.33	30.10	28.96	29.07	29.19	29.30	29.42	29.53	30.01	31.42	31.54
2033	32.36	32.49	32.53	31.33	31.46	31.58	31.71	31.84	31.97	32.32	34.57	34.71
2034	35.58	35.73	35.86	34.58	34.72	34.87	35.01	35.16	35.31	36.06	39.05	39.65
2035	40.64	40.82	40.96	39.55	39.72	39.90	40.07	40.24	40.42	41.29	42.78	42.96
2036	44.04	44.21	43.00	41.54	41.72	41.90	42.08	42.27	42.46	43.49	45.32	45.51
2037	46.68	46.88	45.92	44.39	44.58	44.78	44.98	45.18	45.38	46.72	48.74	48.95
2038	50.20	50.43	49.55	47.92	48.13	48.35	48.57	48.79	49.01	50.15	52.22	52.45
2039	53.78	54.01	51.56	49.88	50.11	50.34	50.56	50.79	51.03	52.25	54.37	54.61
2040	57.01	55.99	54.52	52.79	53.02	53.26	53.49	53.74	53.98	54.90	56.49	56.74
2041	58.22	57.19	55.69	53.92	54.16	54.40	54.64	54.89	55.14	56.08	57.70	57.95
2042	59.46	58.40	56.87	55.07	55.31	55.56	55.80	56.05	56.31	57.27	58.92	59.18
2043	60.72	59.64	58.08	56.24	56.48	56.74	56.99	57.25	57.50	58.48	60.17	60.44
2044	62.01	60.91	59.31	57.44	57.69	57.95	58.20	58.46	58.73	59.73	61.45	61.72

**SCHEDULE 201 (Continued)**

## PRICING OPTIONS FOR STANDARD PPA (Continued)

**2) Renewable Fixed Price Option**

The Renewable Fixed Price Option is based on Renewable Avoided Costs. It is available only to Renewable QFs that generate electricity from a renewable energy source that may be used by the Company to comply with the Oregon Renewable Portfolio Standard as set forth in ORS 469A.005 to 469A.210 and that satisfy the eligibility requirements identified above.

This option is available for a maximum term of 15 years. Prices will be as established at the time the Standard PPA is executed and will be equal to the Renewable Avoided Costs in Tables 4a and 4b, 5a and 5b, or 6a and 6b, depending on the type of QF, effective at execution. QFs using any resource type other than wind and solar are assumed to be Base Load QFs.

Sellers will retain all Environmental Attributes generated by the facility during the Renewable Resource Sufficiency Period. A Renewable QF choosing the Renewable Fixed Price Option must cede all RPS Attributes generated by the facility to the Company from the start of the Renewable Resource Deficiency Period through the remainder of the PPA term.

Prices paid to the Seller under the Renewable Fixed Price Option include adjustments for the capacity contribution of the QF resource type relative to that of the avoided proxy resource. Both Wind QF resources (Tables 5a and 5b) and the avoided proxy resource, the basis used to determine Renewable Avoided Costs for the Renewable Fixed Price Option, are assumed to have a capacity contribution to peak of 18.59%. The capacity contribution for Solar QF resources (Tables 6a and 6b) is assumed to be 15.33%. The capacity contribution for Base Load QF resources (Tables 4a and 4b) is assumed to be 100%.

The Renewable Avoided Costs during the Renewable Resource Deficiency Period reflect an increase for avoided wind integration costs, shown in Table 7.

Prices paid to the Seller under the Renewable Fixed Price Option for Wind QFs (Tables 5a and 5b) include a reduction for the wind integration costs in Table 7, which cancels out wind integration costs included in the Renewable Avoided Costs during the Renewable Resource Deficiency Period. However, if the Wind QF is outside of PGE's Balancing Authority Area as contemplated in the Commission's Order No. 14-058, the Seller is paid the wind integration charges in Table 7, in addition to the prices listed in Tables 5a and 5b.

Sellers with terms exceeding 15 years from the commercial operation date will receive pricing equal to the Mid-C Index Price for all years up to five in excess of the initial 15 years following the commercial operation date selected by the Seller and memorialized in the PPA.

## SCHEDULE 201 (Continued)

PRICING OPTIONS FOR STANDARD PPA (Continued)  
Renewable Fixed Price Option (Continued)

TABLE 4a												
Renewable Avoided Costs												
Renewable Fixed Price Option for Base Load QF												
On-Peak Forecast (\$/MWH)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49
2020	38.74	35.53	26.79	22.36	21.63	27.26	51.38	60.63	42.57	29.58	30.04	36.10
2021	40.91	38.88	29.06	25.25	22.00	31.53	57.66	71.95	40.89	30.07	30.33	40.86
2022	41.56	39.50	29.54	25.68	22.39	32.05	58.55	73.05	41.54	30.57	30.83	41.51
2023	45.83	43.54	32.48	28.20	24.54	35.27	64.68	80.76	45.80	33.63	33.91	45.76
2024	49.08	46.62	34.76	30.16	26.24	37.75	69.31	86.57	49.05	35.99	36.30	49.01
2025	94.32	90.05	86.22	74.65	68.71	53.60	79.32	86.27	92.22	92.28	93.51	97.39
2026	96.21	91.85	87.94	76.15	70.08	54.67	80.90	88.00	94.07	94.12	95.38	99.34
2027	98.13	93.68	89.70	77.67	71.48	55.76	82.52	89.76	95.95	96.00	97.29	101.32
2028	99.90	95.37	91.32	79.09	72.80	56.81	84.02	91.38	97.68	97.74	99.04	103.15
2029	102.09	97.46	93.32	80.80	74.37	58.01	85.85	93.38	99.82	99.88	101.22	105.41
2030	104.13	99.41	95.18	82.42	75.86	59.17	87.57	95.25	101.82	101.87	103.24	107.52
2031	106.22	101.40	97.08	84.07	77.37	60.36	89.32	97.15	103.85	103.91	105.30	109.67
2032	107.92	103.02	98.63	85.39	78.58	61.28	90.73	98.70	105.52	105.58	106.99	111.43
2033	110.50	105.49	101.00	87.46	80.50	62.79	92.92	101.07	108.04	108.10	109.55	114.09
2034	112.82	107.71	103.13	89.32	82.21	64.16	94.89	103.20	110.31	110.37	111.85	116.48
2035	114.96	109.75	105.08	90.99	83.74	65.33	96.67	105.15	112.40	112.47	113.97	118.70
2036	116.93	111.62	106.87	92.54	85.17	66.44	98.32	106.94	114.32	114.39	115.92	120.73
2037	119.61	114.18	109.32	94.66	87.13	67.96	100.58	109.40	116.94	117.01	118.58	123.49
2038	122.00	116.46	111.51	96.55	88.87	69.32	102.59	111.58	119.28	119.35	120.95	125.96
2039	124.43	118.79	113.74	98.48	90.64	70.71	104.64	113.81	121.66	121.73	123.36	128.48
2040	126.68	120.94	115.80	100.28	92.31	72.03	106.54	115.88	123.86	123.93	125.59	130.79
2041	129.46	123.58	118.33	102.46	94.30	73.56	108.86	118.41	126.57	126.64	128.34	133.66
2042	132.04	126.05	120.69	104.51	96.19	75.03	111.04	120.77	129.10	129.18	130.91	136.34
2043	134.68	128.57	123.10	106.60	98.11	76.53	113.26	123.19	131.68	131.76	133.52	139.06
2044	136.98	130.76	125.20	108.41	99.78	77.83	115.18	125.29	133.93	134.00	135.80	141.43

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Renewable Fixed Price Option (Continued)

<b>TABLE 4b</b>												
<b>Renewable Avoided Costs</b>												
<b>Renewable Fixed Price Option for Base Load QF</b>												
<b>Off-Peak Forecast (\$/MWH)</b>												
<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11
2021	37.66	33.33	24.21	20.10	14.80	16.81	28.76	35.86	31.57	26.26	27.02	37.62
2022	39.53	34.99	25.41	21.09	15.52	17.64	30.18	37.65	33.14	27.56	28.36	39.49
2023	42.17	37.30	27.04	22.40	16.44	18.71	32.15	40.15	35.32	29.34	30.20	42.13
2024	44.93	39.73	28.78	23.83	17.46	19.88	34.23	42.77	37.62	31.24	32.15	44.88
2025	58.19	53.34	52.60	43.71	37.09	21.11	44.24	52.02	56.40	57.61	60.55	62.65
2026	59.35	54.40	53.65	44.59	37.83	21.53	45.13	53.06	57.52	58.76	61.76	63.90
2027	60.53	55.49	54.72	45.48	38.59	21.96	46.03	54.12	58.67	59.94	62.99	65.18
2028	61.58	56.45	55.67	46.26	39.25	22.34	46.82	55.05	59.68	60.97	64.07	66.30
2029	62.98	57.73	56.93	47.31	40.14	22.85	47.89	56.31	61.04	62.36	65.53	67.81
2030	64.24	58.89	58.07	48.26	40.95	23.31	48.85	57.43	62.26	63.60	66.84	69.17
2031	65.52	60.06	59.23	49.22	41.76	23.77	49.82	58.58	63.51	64.87	68.18	70.55
2032	66.65	61.10	60.25	50.07	42.48	24.18	50.68	59.59	64.60	65.99	69.35	71.76
2033	68.17	62.49	61.62	51.21	43.45	24.73	51.83	60.95	66.07	67.49	70.93	73.40
2034	69.53	63.74	62.85	52.23	44.32	25.23	52.87	62.16	67.39	68.84	72.35	74.87
2035	70.92	65.01	64.11	53.28	45.20	25.73	53.92	63.41	68.74	70.22	73.80	76.36
2036	72.14	66.13	65.21	54.19	45.98	26.17	54.85	64.50	69.92	71.42	75.06	77.67
2037	73.78	67.63	66.70	55.43	47.03	26.77	56.10	65.97	71.51	73.05	76.77	79.44
2038	75.25	68.99	68.03	56.54	47.97	27.30	57.22	67.28	72.94	74.51	78.31	81.03
2039	76.76	70.36	69.39	57.66	48.93	27.85	58.37	68.63	74.40	76.00	79.87	82.65
2040	78.08	71.57	70.59	58.66	49.77	28.33	59.37	69.81	75.68	77.31	81.25	84.07
2041	79.86	73.20	72.19	59.99	50.90	28.97	60.72	71.40	77.40	79.07	83.10	85.99
2042	81.45	74.67	73.64	61.19	51.92	29.55	61.94	72.83	78.95	80.65	84.76	87.71
2043	83.08	76.16	75.11	62.41	52.96	30.14	63.17	74.28	80.53	82.26	86.45	89.46
2044	84.51	77.47	76.40	63.49	53.87	30.66	64.26	75.56	81.91	83.67	87.94	91.00



**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Renewable Fixed Price Option (Continued)

<b>TABLE 5a</b>												
<b>Renewable Avoided Costs</b>												
<b>Renewable Fixed Price Option for Wind QF</b>												
<b>On-Peak Forecast (\$/MWH)</b>												
<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
2019	40.36	38.32	28.38	24.56	21.25	30.93	57.43	71.96	40.36	29.40	29.66	40.61
2020	37.84	34.63	25.89	21.46	20.73	26.36	50.48	59.73	41.67	28.68	29.14	35.20
2021	39.99	37.96	28.14	24.33	21.08	30.61	56.74	71.03	39.97	29.15	29.41	39.94
2022	40.62	38.56	28.60	24.74	21.45	31.11	57.61	72.11	40.60	29.63	29.89	40.57
2023	44.87	42.58	31.52	27.24	23.58	34.31	63.72	79.80	44.84	32.67	32.95	44.80
2024	48.10	45.64	33.78	29.18	25.26	36.77	68.33	85.59	48.07	35.01	35.32	48.03
2025	77.01	72.73	68.90	57.34	51.40	36.29	62.00	68.96	74.91	74.96	76.20	80.08
2026	78.55	74.18	70.28	58.49	52.42	37.01	63.24	70.34	76.41	76.46	77.72	81.68
2027	80.12	75.67	71.68	59.65	53.47	37.75	64.51	71.74	77.93	77.99	79.27	83.31
2028	81.53	77.00	72.95	60.71	54.42	38.43	65.65	73.01	79.31	79.36	80.67	84.77
2029	83.36	78.72	74.58	62.07	55.63	39.28	67.11	74.64	81.08	81.14	82.48	86.67
2030	85.02	80.30	76.07	63.31	56.74	40.06	68.46	76.14	82.70	82.76	84.13	88.41
2031	86.72	81.91	77.59	64.57	57.88	40.87	69.83	77.66	84.36	84.42	85.81	90.18
2032	88.16	83.26	78.88	65.63	58.82	41.52	70.98	78.94	85.76	85.82	87.23	91.68
2033	90.22	85.21	80.72	67.18	60.21	42.51	72.64	80.79	87.76	87.82	89.27	93.81
2034	92.07	86.96	82.38	68.57	61.47	43.41	74.14	82.45	89.56	89.63	91.10	95.74
2035	93.87	88.65	83.99	69.90	62.65	44.23	75.58	84.06	91.31	91.37	92.88	97.61
2036	95.47	90.16	85.41	71.08	63.71	44.98	76.86	85.49	92.86	92.93	94.46	99.27
2037	97.66	92.23	87.38	72.72	65.18	46.02	78.63	87.45	94.99	95.06	96.63	101.55
2038	99.60	94.07	89.12	74.16	66.48	46.93	80.20	89.19	96.89	96.96	98.55	103.57
2039	101.60	95.96	90.90	75.65	67.81	47.88	81.80	90.98	98.83	98.90	100.53	105.65
2040	103.39	97.64	92.50	76.99	69.01	48.74	83.25	92.58	100.57	100.64	102.30	107.50
2041	105.70	99.82	94.57	78.70	70.54	49.80	85.10	94.65	102.81	102.88	104.58	109.90
2042	107.82	101.83	96.46	80.28	71.96	50.80	86.81	96.55	104.87	104.95	106.68	112.11
2043	109.97	103.86	98.39	81.88	73.39	51.82	88.54	98.47	106.97	107.04	108.81	114.34
2044	111.85	105.63	100.07	83.28	74.64	52.70	90.05	100.15	108.79	108.87	110.67	116.30

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Renewable Fixed Price Option (Continued)

<b>TABLE 5b</b>												
<b>Renewable Avoided Costs</b>												
<b>Renewable Fixed Price Option for Wind QF</b>												
<b>Off-Peak Forecast (\$/MWH)</b>												
<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
2019	36.79	32.46	23.29	19.21	13.86	15.89	27.87	35.01	30.68	25.32	26.09	32.46
2020	33.69	28.83	22.85	14.13	12.08	12.53	25.03	31.37	29.73	25.12	25.68	29.21
2021	36.74	32.41	23.29	19.18	13.88	15.89	27.84	34.94	30.65	25.34	26.10	36.70
2022	38.59	34.05	24.47	20.15	14.58	16.70	29.24	36.71	32.20	26.62	27.42	38.55
2023	41.21	36.34	26.08	21.44	15.48	17.75	31.19	39.19	34.36	28.38	29.24	41.17
2024	43.95	38.75	27.80	22.85	16.48	18.90	33.25	41.79	36.64	30.26	31.17	43.90
2025	57.19	52.34	51.60	42.71	36.09	20.11	43.24	51.02	55.40	56.61	59.55	61.65
2026	58.33	53.38	52.63	43.57	36.81	20.51	44.11	52.04	56.50	57.74	60.74	62.88
2027	59.49	54.45	53.68	44.44	37.55	20.92	44.99	53.08	57.63	58.90	61.95	64.14
2028	60.52	55.39	54.61	45.20	38.19	21.28	45.76	53.99	58.62	59.91	63.01	65.24
2029	61.90	56.65	55.85	46.23	39.06	21.77	46.81	55.23	59.96	61.28	64.45	66.73
2030	63.14	57.79	56.97	47.16	39.85	22.21	47.75	56.33	61.16	62.50	65.74	68.07
2031	64.40	58.94	58.11	48.10	40.64	22.65	48.70	57.46	62.39	63.75	67.06	69.43
2032	65.51	59.96	59.11	48.93	41.34	23.04	49.54	58.45	63.46	64.85	68.21	70.62
2033	67.00	61.32	60.45	50.04	42.28	23.56	50.66	59.78	64.90	66.32	69.76	72.23
2034	68.34	62.55	61.66	51.04	43.13	24.04	51.68	60.97	66.20	67.65	71.16	73.68
2035	69.71	63.80	62.90	52.07	43.99	24.52	52.71	62.20	67.53	69.01	72.59	75.15
2036	70.90	64.89	63.97	52.95	44.74	24.93	53.61	63.26	68.68	70.18	73.82	76.43
2037	72.52	66.37	65.44	54.17	45.77	25.51	54.84	64.71	70.25	71.79	75.51	78.18
2038	73.96	67.70	66.74	55.25	46.68	26.01	55.93	65.99	71.65	73.22	77.02	79.74
2039	75.45	69.05	68.08	56.35	47.62	26.54	57.06	67.32	73.09	74.69	78.56	81.34
2040	76.74	70.23	69.25	57.32	48.43	26.99	58.03	68.47	74.34	75.97	79.91	82.73
2041	78.49	71.83	70.82	58.62	49.53	27.60	59.35	70.03	76.03	77.70	81.73	84.62
2042	80.06	73.28	72.25	59.80	50.53	28.16	60.55	71.44	77.56	79.26	83.37	86.32
2043	81.66	74.74	73.69	60.99	51.54	28.72	61.75	72.86	79.11	80.84	85.03	88.04
2044	83.06	76.02	74.95	62.04	52.42	29.21	62.81	74.11	80.46	82.22	86.49	89.55

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Renewable Fixed Price Option (Continued)

<b>TABLE 6a</b>												
<b>Renewable Avoided Costs</b>												
<b>Renewable Fixed Price Option for Solar QF</b>												
<b>On-Peak Forecast (\$/MWH)</b>												
<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49
2020	38.74	35.53	26.79	22.36	21.63	27.26	51.38	60.63	42.57	29.58	30.04	36.10
2021	40.91	38.88	29.06	25.25	22.00	31.53	57.66	71.95	40.89	30.07	30.33	40.86
2022	41.56	39.50	29.54	25.68	22.39	32.05	58.55	73.05	41.54	30.57	30.83	41.51
2023	45.83	43.54	32.48	28.20	24.54	35.27	64.68	80.76	45.80	33.63	33.91	45.76
2024	49.08	46.62	34.76	30.16	26.24	37.75	69.31	86.57	49.05	35.99	36.30	49.01
2025	73.86	69.59	65.76	54.19	48.25	33.14	58.86	65.81	71.76	71.82	73.05	76.93
2026	75.34	70.98	67.07	55.28	49.21	33.80	60.03	67.13	73.20	73.25	74.51	78.47
2027	76.85	72.39	68.41	56.38	50.20	34.48	61.23	68.47	74.66	74.72	76.00	80.04
2028	78.19	73.66	69.61	57.38	51.08	35.09	62.31	69.67	75.97	76.02	77.33	81.44
2029	79.95	75.32	71.17	58.66	52.22	35.87	63.71	71.23	77.68	77.73	79.07	83.27
2030	81.55	76.82	72.59	59.83	53.27	36.59	64.98	72.66	79.23	79.28	80.65	84.93
2031	83.18	78.36	74.04	61.03	54.33	37.32	66.28	74.11	80.81	80.87	82.26	86.63
2032	84.57	79.67	75.28	62.04	55.23	37.93	67.38	75.35	82.17	82.23	83.64	88.08
2033	86.53	81.52	77.03	63.49	56.53	38.82	68.95	77.10	84.07	84.13	85.58	90.13
2034	88.29	83.18	78.60	64.79	57.69	39.63	70.36	78.67	85.78	85.85	87.32	91.96
2035	90.03	84.81	80.14	66.05	58.81	40.39	71.74	80.21	87.47	87.53	89.04	93.76
2036	91.57	86.27	81.52	67.18	59.81	41.08	72.97	81.59	88.97	89.03	90.56	95.37
2037	93.66	88.24	83.38	68.72	61.18	42.02	74.63	83.45	91.00	91.06	92.63	97.55
2038	95.53	90.00	85.05	70.09	62.40	42.86	76.12	85.12	92.82	92.88	94.48	99.50
2039	97.44	91.80	86.74	71.49	63.65	43.72	77.65	86.82	94.67	94.74	96.37	101.49
2040	99.15	93.41	88.27	72.75	64.78	44.50	79.01	88.34	96.33	96.40	98.06	103.26
2041	101.38	95.50	90.25	74.38	66.22	45.48	80.78	90.33	98.49	98.56	100.26	105.58
2042	103.40	97.41	92.05	75.87	67.54	46.39	82.39	92.13	100.46	100.53	102.27	107.69
2043	105.47	99.36	93.89	77.38	68.89	47.32	84.04	93.97	102.47	102.54	104.31	109.85
2044	107.28	101.06	95.50	78.71	70.07	48.13	85.48	95.58	104.23	104.30	106.10	111.73

**SCHEDULE 201 (Continued)**PRICING OPTIONS FOR STANDARD PPA (Continued)  
Renewable Fixed Price Option (Continued)

<b>TABLE 6b</b>												
<b>Renewable Avoided Costs</b>												
<b>Renewable Fixed Price Option for Solar QF</b>												
<b>Off-Peak Forecast (\$/MWH)</b>												
<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11
2021	37.66	33.33	24.21	20.10	14.80	16.81	28.76	35.86	31.57	26.26	27.02	37.62
2022	39.53	34.99	25.41	21.09	15.52	17.64	30.18	37.65	33.14	27.56	28.36	39.49
2023	42.17	37.30	27.04	22.40	16.44	18.71	32.15	40.15	35.32	29.34	30.20	42.13
2024	44.93	39.73	28.78	23.83	17.46	19.88	34.23	42.77	37.62	31.24	32.15	44.88
2025	58.19	53.34	52.60	43.71	37.09	21.11	44.24	52.02	56.40	57.61	60.55	62.65
2026	59.35	54.40	53.65	44.59	37.83	21.53	45.13	53.06	57.52	58.76	61.76	63.90
2027	60.53	55.49	54.72	45.48	38.59	21.96	46.03	54.12	58.67	59.94	62.99	65.18
2028	61.58	56.45	55.67	46.26	39.25	22.34	46.82	55.05	59.68	60.97	64.07	66.30
2029	62.98	57.73	56.93	47.31	40.14	22.85	47.89	56.31	61.04	62.36	65.53	67.81
2030	64.24	58.89	58.07	48.26	40.95	23.31	48.85	57.43	62.26	63.60	66.84	69.17
2031	65.52	60.06	59.23	49.22	41.76	23.77	49.82	58.58	63.51	64.87	68.18	70.55
2032	66.65	61.10	60.25	50.07	42.48	24.18	50.68	59.59	64.60	65.99	69.35	71.76
2033	68.17	62.49	61.62	51.21	43.45	24.73	51.83	60.95	66.07	67.49	70.93	73.40
2034	69.53	63.74	62.85	52.23	44.32	25.23	52.87	62.16	67.39	68.84	72.35	74.87
2035	70.92	65.01	64.11	53.28	45.20	25.73	53.92	63.41	68.74	70.22	73.80	76.36
2036	72.14	66.13	65.21	54.19	45.98	26.17	54.85	64.50	69.92	71.42	75.06	77.67
2037	73.78	67.63	66.70	55.43	47.03	26.77	56.10	65.97	71.51	73.05	76.77	79.44
2038	75.25	68.99	68.03	56.54	47.97	27.30	57.22	67.28	72.94	74.51	78.31	81.03
2039	76.76	70.36	69.39	57.66	48.93	27.85	58.37	68.63	74.40	76.00	79.87	82.65
2040	78.08	71.57	70.59	58.66	49.77	28.33	59.37	69.81	75.68	77.31	81.25	84.07
2041	79.86	73.20	72.19	59.99	50.90	28.97	60.72	71.40	77.40	79.07	83.10	85.99
2042	81.45	74.67	73.64	61.19	51.92	29.55	61.94	72.83	78.95	80.65	84.76	87.71
2043	83.08	76.16	75.11	62.41	52.96	30.14	63.17	74.28	80.53	82.26	86.45	89.46
2044	84.51	77.47	76.40	63.49	53.87	30.66	64.26	75.56	81.91	83.67	87.94	91.00

## SCHEDULE 201 (Continued)

## WIND INTEGRATION

<b>TABLE 7</b>		
<b>Integration Costs</b>		
<b>Year</b>	<b>Wind</b>	<b>Solar</b>
2019	0.88	0.00
2020	0.90	0.00
2021	0.92	0.00
2022	0.94	0.00
2023	0.96	0.00
2024	0.98	0.00
2025	1.00	0.00
2026	1.02	0.00
2027	1.04	0.00
2028	1.06	0.00
2029	1.08	0.00
2030	1.10	0.00
2031	1.12	0.00
2032	1.14	0.00
2033	1.17	0.00
2034	1.19	0.00
2035	1.21	0.00
2036	1.24	0.00
2037	1.26	0.00
2038	1.29	0.00
2039	1.31	0.00
2040	1.34	0.00
2041	1.37	0.00
2042	1.39	0.00
2043	1.42	0.00
2044	1.45	0.00

**SCHEDULE 201 (Continued)****MONTHLY SERVICE CHARGE**

Each separately metered QF not associated with a retail Customer account will be charged \$10.00 per month.

**INSURANCE REQUIREMENTS**

The following insurance requirements are applicable to Sellers with a Standard PPA:

- 1) QFs with nameplate capacity ratings greater than 200 kW are required to secure and maintain a prudent amount of general liability insurance. The Seller must certify to the Company that it is maintaining general liability insurance coverage for each QF at prudent amounts. A prudent amount will be deemed to mean liability insurance coverage for both bodily injury and property damage liability in the amount of not less than \$1,000,000 each occurrence combined single limit, which limits may be required to be increased or decreased by the Company as the Company determines in its reasonable judgment, that economic conditions or claims experience may warrant.
- 2) Such insurance will include an endorsement naming the Company as an additional insured insofar as liability arising out of operations under this schedule and a provision that such liability policies will not be canceled or their limits reduced without 30 days' written notice to the Company. The Seller will furnish the Company with certificates of insurance together with the endorsements required herein. The Company will have the right to inspect the original policies of such insurance.
- 3) QFs with a design capacity of 200 kW or less are encouraged to pursue liability insurance on their own. The Oregon Public Utility Commission in Order No. 05-584 determined that it is inappropriate to require QFs that have a design capacity of 200 kW or less to obtain general liability insurance.

**TRANSMISSION AGREEMENTS**

If the QF is located outside the Company's service territory, the Seller is responsible for the transmission of power at its cost to the Company's service territory.

**INTERCONNECTION REQUIREMENTS**

Except as otherwise provided in a generation Interconnection Agreement between the Company and Seller, if the QF is located within the Company's service territory, switching equipment capable of isolating the QF from the Company's system will be accessible to the Company at all times. At the Company's option, the Company may operate the switching equipment described above if, in the sole opinion of the Company, continued operation of the QF in connection with the utility's system may create or contribute to a system emergency.

**SCHEDULE 201 (Continued)****INTERCONNECTION REQUIREMENTS (Continued)**

The QF owner interconnecting with the Company's distribution system must comply with all requirements for interconnection as established pursuant to Commission rule, in the Company's Rules and Regulations (Rule C) or the Company's Interconnection Procedures contained in its FERC Open Access Transmission Tariff (OATT), as applicable. The Seller will bear full responsibility for the installation and safe operation of the interconnection facilities.

**DEFINITION OF A SMALL COGENERATION FACILITY OR SMALL POWER PRODUCTION FACILITY ELIGIBLE TO RECEIVE THE STANDARD FIXED PRICE OPTION OR THE RENEWABLE FIXED PRICE OPTION UNDER THE STANDARD PPA**

A QF will be eligible to receive the Standard Fixed Price Option or the Renewable Fixed Price Option (as appropriate) under the Standard PPA if the nameplate capacity of the QF, together with any other electric generating facility using the same motive force, owned or controlled by the Same Person(s) or Affiliated Person(s), and located at the Same Site, does not exceed 3 MW for solar QF projects or 10 MW for all other types of QF projects. Solar QF projects with nameplate capacity (as calculated in this paragraph) that exceed 3 MW but do not exceed 10 MW are eligible for a Standard PPA containing negotiated prices under Schedule 202. A Community-Based or Family-Owned QF is exempt from these restrictions.

**Definition of Community-Based**

- a. A community project (or a community sponsored project) must have a recognized and established organization located within the county of the project or within 50 miles of the project that has a genuine role in helping the project be developed and must have some not insignificant continuing role with or interest in the project after it is completed and placed in service.
- b. After excluding the passive investor whose ownership interests are primarily related to green tag values and tax benefits as the primary ownership benefit, the equity (ownership) interests in a community sponsored project must be owned in substantial percentage (80 percent or more) by the following persons (individuals and entities): (i) the sponsoring organization, or its controlled affiliates; (ii) members of the sponsoring organization (if it is a membership organization) or owners of the sponsorship organization (if it is privately owned); (iii) persons who live in the county in which the project is located or who live a county adjoining the county in which the project is located; or (iv) units of local government, charities, or other established nonprofit organizations active either in the county in which the project is located or active in a county adjoining the county in which the project is located.

**Definition of Family-Owned**

After excluding the ownership interest of the passive investor whose ownership interests are primarily related to green tag values and tax benefits as the primary ownership benefit, five or fewer individuals own 50 percent or more of the equity of the project entity, or fifteen or fewer individuals own 90 percent or more of the project entity. A "look through" rule applies to closely held entities that hold the project entity, so that equity held by LLCs, trusts, estates, corporations, partnerships or other similar entities is considered

**SCHEDULE 201 (Continued)****DEFINITION OF A SMALL COGENERATION FACILITY OR SMALL POWER PRODUCTION FACILITY ELIGIBLE TO RECEIVE THE STANDARD FIXED PRICE OPTION OR THE RENEWABLE FIXED PRICE OPTION UNDER THE STANDARD PPA (Continued)**

held by the equity owners of the look through entity. An individual is a natural person. In counting to five or fifteen, spouses or children of an equity owner of the project owner who also have an equity interest are aggregated and counted as a single individual.

**Definition of Person(s) or Affiliated Person(s)**

As used above, the term "Same Person(s)" or "Affiliated Person(s)" means a natural person or persons or any legal entity or entities sharing common ownership, management or acting jointly or in concert with or exercising influence over the policies or actions of another person or entity. However, two facilities will not be held to be owned or controlled by the Same Person(s) or Affiliated Person(s) solely because they are developed by a single entity.

Furthermore, two facilities will not be held to be owned or controlled by the Same Person(s) or Affiliated Person(s) if such common person or persons is a "passive investor" whose ownership interest in the QF is primarily related to utilizing production tax credits, green tag values and MACRS depreciation as the primary ownership benefit and the facilities at issue are independent family-owned or community-based projects. A unit of Oregon local government may also be a "passive investor" in a community-based project if the local governmental unit demonstrates that it will not have an equity ownership interest in or exercise any control over the management of the QF and that its only interest is a share of the cash flow from the QF, which share will not exceed 20%. The 20% cash flow share limit may only be exceeded for good cause shown and only with the prior approval of the Commission.

**Definition of Same Site**

For purposes of the foregoing, generating facilities are considered to be located at the same site as the QF for which qualification for standard pricing or negotiated pricing under the Standard PPA is sought if they are located within a five-mile radius of any generating facilities or equipment providing fuel or motive force associated with the QF for which qualification for standard pricing or negotiated pricing under the Standard PPA is sought.

**Definition of Shared Interconnection and Infrastructure**

QFs otherwise meeting the above-described separate ownership test and thereby qualified for entitlement to standard pricing or negotiated pricing under the Standard PPA will not be disqualified by utilizing an interconnection or other infrastructure not providing motive force or fuel that is shared with other QFs qualifying for standard pricing or negotiated pricing under the Standard PPA so long as the use of the shared interconnection complies with the interconnecting utility's safety and reliability standards, interconnection agreement requirements and Prudent Electrical Practices as that term is defined in the interconnecting utility's approved Standard PPA.



**SCHEDULE 201 (Continued)****OTHER DEFINITIONS****Mid-C Index Price**

As used in this schedule, the daily Mid-C Index Price shall be the Day Ahead Intercontinental Exchange ("ICE") for the bilateral OTC market for energy at the Mid-C Physical for Average On-Peak Power and Average Off-Peak Power found on the following website: <https://www.theice.com/products/OTC/Physical-Energy/Electricity>. In the event ICE no longer publishes this index, PGE and the Seller agree to select an alternative successor index representative of the Mid-C trading hub.

**Definition of RPS Attributes**

As used in this schedule, RPS Attributes means all attributes related to the Net Output generated by the Facility that are required in order to provide PGE with "qualifying electricity," as that term is defined in Oregon's Renewable Portfolio Standard Act, Ore. Rev. Stat. 469A.010, in effect at the time of execution of this Agreement. RPS Attributes do not include Environmental Attributes that are greenhouse gas offsets from methane capture not associated with the generation of electricity and not needed to ensure that there are zero net emissions associated with the generation of electricity.

**Definition of Environmental Attributes**

As used in this schedule, Environmental Attributes shall mean any and all claims, credits, benefits, emissions reductions, offsets, and allowances, howsoever entitled, resulting from the avoidance of the emission of any gas, chemical, or other substance to the air, soil or water. Environmental Attributes include but are not limited to: (1) any avoided emissions of pollutants to the air, soil, or water such as (subject to the foregoing) sulfur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO), and other pollutants; and (2) any avoided emissions of carbon dioxide (CO2), methane (CH4), and other greenhouse gases (GHGs) that have been determined by the United Nations Intergovernmental Panel on Climate Change to contribute to the actual or potential threat of altering the Earth's climate by trapping heat in the atmosphere.

**Definition of Resource Sufficiency Period**

This is the period from the current year through 2020.

**Definition of Resource Deficiency Period**

This is the period from 2021.

**Definition of Renewable Resource Sufficiency Period**

This is the period from the current year through 2024.

**Definition of Renewable Resource Deficiency Period**

This is the period from 2025.

**SCHEDULE 201 (Concluded)****DISPUTE RESOLUTION**

Upon request, the QF will provide the purchasing utility with documentation verifying the ownership, management and financial structure of the QF in reasonably sufficient detail to allow the utility to make an initial determination of whether or not the QF meets the above-described criteria for entitlement to standard pricing or negotiated pricing under the Standard PPA.

The QF may present disputes to the Commission for resolution using the following process:

The QF may file a complaint asking the Commission to adjudicate disputes regarding the formation of the standard contract. The QF may not file such a complaint during any 15-day period in which the utility has the obligation to respond, but must wait until the 15-day period has passed.

The utility may respond to the complaint within ten days of service.

The Commission will limit its review to the issues identified in the complaint and response, and utilize a process similar to the arbitration process adopted to facilitate the execution of interconnection agreements among telecommunications carriers. See OAR 860, Division 016. The administrative law judge will not act as an arbitrator.

**SPECIAL CONDITIONS**

1. Delivery of energy by Seller will be at a voltage, phase, frequency, and power factor as specified by the Company.
2. If the Seller also receives retail Electricity Service from the Company at the same location, any payments under this schedule will be credited to the Seller's retail Electricity Service bill. At the option of the Customer, any net credit over \$10.00 will be paid by check to the Customer.
3. Unless required by state or federal law, if the 1978 Public Utility Regulatory Policies Act (PURPA) is repealed, PPAs entered into pursuant to this schedule will not terminate prior to the Standard or Negotiated PPA's termination date.

**TERM OF AGREEMENT**

Not less than one year and not to exceed 20 years from the commercial operation date selected by the Seller and memorialized in the PPA.

UM 2001

Enhanced Update to Schedule 201  
Avoided Cost Power Purchase Information

Attachment A  
Summary of Standard Avoided Costs

## **Standard Energy Tables**

Portland General Electric												
Avoided Cost Study												
On-Peak Energy, Base Load												
Nominal \$/MWh												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49
2020	38.74	35.53	26.79	22.36	21.65	27.26	51.38	60.63	42.57	29.58	30.04	36.10
2021	17.16	16.80	15.80	14.18	14.00	14.25	14.51	14.75	14.59	14.75	16.48	17.63
2022	18.62	18.26	17.64	15.25	15.10	15.29	15.50	15.57	15.52	15.69	17.43	18.43
2023	19.40	19.07	18.51	16.96	16.88	17.12	17.37	17.50	17.54	17.74	18.56	19.56
2024	19.33	19.39	19.45	18.93	19.02	19.08	19.15	19.21	19.28	19.35	20.33	20.40
2025	21.03	21.10	21.16	20.29	20.35	20.37	20.44	20.51	20.58	20.65	21.56	21.63
2026	22.17	22.14	22.39	21.47	21.54	21.24	21.31	21.39	21.47	21.54	22.61	22.69
2027	23.23	23.22	22.39	21.47	21.54	21.45	21.52	21.60	21.68	21.84	22.77	22.84
2028	23.36	22.82	22.59	21.65	21.72	21.80	21.88	21.95	22.03	22.14	23.22	23.30
2029	26.93	24.06	23.11	23.19	23.28	24.39	24.57	24.48	24.57	24.82	25.97	26.06
2030	26.81	26.91	26.81	25.76	25.86	26.05	26.15	26.25	26.42	27.67	27.78	28.54
2031	28.48	28.59	28.38	27.14	27.24	27.34	27.45	27.55	27.66	28.02	29.37	29.48
2032	30.21	30.33	30.10	28.96	29.07	29.19	29.30	29.42	29.53	30.01	31.42	31.54
2033	32.36	32.49	32.53	31.33	31.46	31.58	31.71	31.84	31.97	32.32	34.71	35.97
2034	35.58	35.73	35.86	34.58	34.72	34.87	35.01	35.16	35.31	36.06	39.05	39.65
2035	40.64	40.82	40.96	39.55	39.72	39.90	40.07	40.24	40.42	41.29	42.78	42.96
2036	44.04	44.21	43.00	41.54	41.72	41.90	42.08	42.27	42.46	43.49	45.32	45.51
2037	46.68	46.88	45.92	44.39	44.58	44.78	44.98	45.18	45.38	46.72	48.74	48.95
2038	50.20	50.43	49.55	47.92	48.13	48.35	48.57	48.79	49.01	50.15	52.22	52.45
2039	53.78	54.01	51.56	49.88	50.11	50.34	50.56	50.79	51.03	52.25	54.37	54.61
2040	57.01	55.99	54.52	52.79	53.02	53.26	53.49	53.74	53.98	54.90	56.49	56.74
2041	58.22	57.19	55.69	53.92	54.16	54.40	54.64	54.89	55.14	56.08	57.70	57.95
2042	59.46	58.40	56.87	55.07	55.31	55.56	55.80	56.05	56.31	57.27	58.92	59.18
2043	60.72	59.64	58.08	56.24	56.48	56.74	56.99	57.25	57.50	58.48	60.17	60.44
2044	62.01	60.91	59.31	57.44	57.69	57.95	58.20	58.46	58.73	59.73	61.45	61.72

Portland General Electric												
Avoided Cost Study												
Off-Peak Energy, Base Load												
Nominal \$/MWh												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11
2021	17.16	15.80	14.18	14.00	14.25	14.51	14.75	14.59	14.75	14.75	16.48	17.63
2022	18.62	18.26	17.64	15.25	15.10	15.29	15.50	15.57	15.52	15.69	17.43	18.43
2023	19.40	19.07	18.51	16.96	16.88	17.12	17.37	17.50	17.54	17.74	18.56	19.56
2024	19.33	19.39	19.45	18.93	19.02	19.08	19.15	19.21	19.28	19.35	20.33	20.40
2025	21.16	21.10	21.16	20.29	20.35	20.37	20.44	20.51	20.58	20.65	21.56	21.63
2026	22.17	22.14	22.39	21.47	21.54	21.24	21.31	21.39	21.47	21.54	22.61	22.69
2027	23.23	23.22	22.39	21.47	21.54	21.45	21.52	21.60	21.68	21.84	22.77	22.84
2028	23.36	22.82	22.59	21.65	21.72	21.80	21.88	21.95	22.03	22.14	23.22	23.30
2029	26.93	24.06	23.11	23.19	23.28	24.39	24.57	24.48	24.57	24.82	25.97	26.06
2030	26.81	26.91	26.81	25.76	25.86	26.05	26.15	26.25	26.42	27.67	27.78	28.54
2031	28.48	28.59	28.38	27.14	27.24	27.34	27.45	27.55	27.66	28.02	29.37	29.48
2032	30.21	30.33	30.10	28.96	29.07	29.19	29.30	29.42	29.53	30.01	31.42	31.54
2033	32.36	32.49	32.53	31.33	31.46	31.58	31.71	31.84	31.97	32.32	34.71	35.97
2034	35.58	35.73	35.86	34.58	34.72	34.87	35.01	35.16	35.31	36.06	39.05	39.65
2035	40.64	40.82	40.96	39.55	39.72	39.90	40.07	40.24	40.42	41.29	42.78	42.96
2036	44.04	44.21	43.00	41.54	41.72	41.90	42.08	42.27	42.46	43.49	45.32	45.51
2037	46.68	46.88	45.92	44.39	44.58	44.78	44.98	45.18	45.38	46.72	48.74	48.95
2038	50.20	50.43	49.55	47.92	48.13	48.35	48.57	48.79	49.01	50.15	52.22	52.45
2039	53.78	54.01	51.56	49.88	50.11	50.34	50.56	50.79	51.03	52.25	54.37	54.61
2040	57.01	55.99	54.52	52.79	53.02	53.26	53.49	53.74	53.98	54.90	56.49	56.74
2041	58.22	57.19	55.69	53.92	54.16	54.40	54.64	54.89	55.14	56.08	57.70	57.95
2042	59.46	58.40	56.87	55.07	55.31	55.56	55.80	56.05	56.31	57.27	58.92	59.18
2043	60.72	59.64	58.08	56.24	56.48	56.74	56.99	57.25	57.50	58.48	60.17	60.44
2044	62.01	60.91	59.31	57.44	57.69	57.95	58.20	58.46	58.73	59.73	61.45	61.72

PGE's 2019 Standard AVOIDED COST ENHANCED UPDATE  
SUMMARY TABLES – Page 4

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
2019	40.36	38.32	28.38	24.56	21.25	30.93	57.43	71.96	40.36	29.40	29.66	40.61	
2020	37.84	34.63	25.89	21.46	20.73	26.36	50.48	59.73	41.67	28.68	29.14	35.20	34.40
2021	16.24	15.88	14.88	13.26	13.08	13.33	13.59	13.69	13.67	13.83	15.56	16.71	14.48
2022	17.68	17.32	16.70	14.31	14.16	14.35	14.56	14.63	14.58	14.75	16.49	17.49	15.58
2023	18.44	18.11	17.55	16.00	15.92	16.16	16.41	16.54	16.58	16.78	17.60	18.60	17.06
2024	18.35	18.41	18.47	17.95	18.04	18.10	18.17	18.23	18.30	18.37	19.35	19.42	18.43
2025	20.03	20.10	20.16	19.29	19.35	19.37	19.44	19.51	19.58	19.65	20.56	20.63	19.81
2026	21.15	20.92	20.95	20.08	20.15	20.22	20.29	20.37	20.45	20.52	21.59	21.67	20.69
2027	22.19	22.18	21.35	20.43	20.50	20.41	20.48	20.56	20.64	20.80	21.73	21.80	21.08
2028	22.30	21.76	21.53	20.59	20.66	20.74	20.82	20.89	20.97	21.08	22.16	22.24	21.31
2029	22.85	22.93	22.98	22.03	22.11	22.20	23.31	23.40	23.49	23.74	24.89	24.98	23.24
2030	25.71	25.81	25.71	24.66	24.76	24.86	24.95	25.05	25.15	25.32	26.57	26.68	25.44
2031	27.36	27.47	27.26	26.02	26.12	26.22	26.33	26.43	26.54	26.90	28.25	28.36	26.93
2032	29.07	29.19	28.96	27.82	27.93	28.05	28.16	28.28	28.39	28.87	30.28	30.40	28.78
2033	31.19	31.32	31.36	30.16	30.29	30.41	30.54	30.67	30.80	31.15	33.40	33.54	31.24
2034	34.39	34.54	34.67	33.39	33.53	33.68	33.82	33.97	34.12	34.87	37.86	38.46	34.78
2035	39.43	39.61	39.75	38.34	38.51	38.69	38.86	39.03	39.21	40.08	41.57	41.75	39.57
2036	42.80	42.97	41.76	40.30	40.48	40.66	40.84	41.03	41.22	42.25	44.08	44.27	41.88
2037	45.42	45.62	44.66	43.13	43.32	43.52	43.72	43.92	44.12	45.46	47.48	47.69	44.84
2038	48.91	49.14	48.26	46.63	46.84	47.06	47.28	47.50	47.72	48.86	50.93	51.16	48.35
2039	52.47	52.70	50.25	48.57	48.80	49.03	49.25	49.48	49.72	50.94	53.06	53.30	50.62
2040	55.67	54.65	53.18	51.45	51.68	51.92	52.15	52.40	52.64	53.56	55.15	55.40	53.32
2041	56.85	55.82	54.32	52.55	52.79	53.03	53.27	53.52	53.77	54.71	56.33	56.58	54.46
2042	58.07	57.01	55.48	53.68	53.92	54.17	54.41	54.66	54.92	55.88	57.53	57.79	55.62
2043	59.30	58.22	56.66	54.82	55.06	55.32	55.57	55.83	56.08	57.06	58.75	59.02	56.80
2044	60.56	59.46	57.86	55.99	56.24	56.50	56.75	57.01	57.28	58.28	60.00	60.27	58.01
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
2019	36.79	32.46	23.29	19.21	13.86	15.89	27.87	35.01	30.68	25.32	26.09	32.46	
2020	33.69	28.83	22.85	14.13	12.08	12.53	25.03	31.37	29.73	25.12	25.68	29.21	24.18
2021	16.24	15.88	14.88	13.26	13.08	13.33	13.59	13.69	13.67	13.83	15.56	16.71	14.47
2022	17.68	17.32	16.70	14.31	14.16	14.35	14.56	14.63	14.58	14.75	16.49	17.49	15.57
2023	18.44	18.11	17.55	16.00	15.92	16.16	16.41	16.54	16.58	16.78	17.60	18.60	17.05
2024	18.35	18.41	18.47	17.95	18.04	18.10	18.17	18.23	18.30	18.37	19.35	19.42	18.43
2025	20.03	20.10	20.16	19.29	19.35	19.37	19.44	19.51	19.58	19.65	20.56	20.63	19.81
2026	21.15	20.92	20.95	20.08	20.15	20.22	20.29	20.37	20.45	20.52	21.59	21.67	20.70
2027	22.19	22.18	21.35	20.43	20.50	20.41	20.48	20.56	20.64	20.80	21.73	21.80	21.08
2028	22.30	21.76	21.53	20.59	20.66	20.74	20.82	20.89	20.97	21.08	22.16	22.24	21.31
2029	22.85	22.93	22.98	22.03	22.11	22.20	23.31	23.40	23.49	23.74	24.89	24.98	23.25
2030	25.71	25.81	25.71	24.66	24.76	24.86	24.95	25.05	25.15	25.32	26.57	26.68	25.43
2031	27.36	27.47	27.26	26.02	26.12	26.22	26.33	26.43	26.54	26.90	28.25	28.36	26.94
2032	29.07	29.19	28.96	27.82	27.93	28.05	28.16	28.28	28.39	28.87	30.28	30.40	28.78
2033	31.19	31.32	31.36	30.16	30.29	30.41	30.54	30.67	30.80	31.15	33.40	33.54	31.23
2034	34.39	34.54	34.67	33.39	33.53	33.68	33.82	33.97	34.12	34.87	37.86	38.46	34.76
2035	39.43	39.61	39.75	38.34	38.51	38.69	38.86	39.03	39.21	40.08	41.57	41.75	39.57
2036	42.80	42.97	41.76	40.30	40.48	40.66	40.84	41.03	41.22	42.25	44.08	44.27	41.88
2037	45.42	45.62	44.66	43.13	43.32	43.52	43.72	43.92	44.12	45.46	47.48	47.69	44.84
2038	48.91	49.14	48.26	46.63	46.84	47.06	47.28	47.50	47.72	48.86	50.93	51.16	48.36
2039	52.47	52.70	50.25	48.57	48.80	49.03	49.25	49.48	49.72	50.94	53.06	53.30	50.62
2040	55.67	54.65	53.18	51.45	51.68	51.92	52.15	52.40	52.64	53.56	55.15	55.40	53.32
2041	56.85	55.82	54.32	52.55	52.79	53.03	53.27	53.52	53.77	54.71	56.33	56.58	54.46
2042	58.07	57.01	55.48	53.68	53.92	54.17	54.41	54.66	54.92	55.88	57.53	57.79	55.62
2043	59.30	58.22	56.66	54.82	55.06	55.32	55.57	55.83	56.08	57.06	58.75	59.02	56.80
2044	60.56	59.46	57.86	55.99	56.24	56.50	56.75	57.01	57.28	58.28	60.00	60.27	58.01

PGE's 2019 Standard AVOIDED COST ENHANCED UPDATE  
SUMMARY TABLES – Page 5

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
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49	
2020	38.74	35.53	26.79	22.36	21.63	27.26	51.38	60.63	42.57	29.58	30.04	36.10	35.30
2021	17.16	16.80	15.80	14.18	14.00	14.25	14.51	14.61	14.59	14.75	16.48	17.63	15.40
2022	18.62	18.26	17.64	15.25	15.10	15.29	15.50	15.57	15.52	15.69	17.43	18.43	16.52
2023	19.40	19.07	18.51	16.96	16.88	17.12	17.37	17.50	17.54	17.74	18.56	19.56	18.02
2024	19.33	19.39	19.45	18.93	19.02	19.08	19.15	19.21	19.28	19.35	20.33	20.40	19.41
2025	21.03	21.10	21.16	20.29	20.35	20.37	20.44	20.51	20.58	20.65	21.56	21.63	20.81
2026	22.17	21.94	21.97	21.10	21.17	21.24	21.31	21.39	21.47	21.54	22.61	22.69	21.71
2027	23.23	23.22	22.39	21.47	21.54	21.45	21.52	21.60	21.68	21.84	22.77	22.84	22.12
2028	23.36	22.82	22.59	21.65	21.72	21.80	21.88	21.95	22.03	22.14	23.22	23.30	22.37
2029	23.93	24.01	24.06	23.11	23.19	23.28	24.39	24.48	24.57	24.82	25.97	26.06	24.32
2030	26.81	26.91	26.81	25.76	25.86	25.96	26.05	26.15	26.25	26.42	27.67	27.78	26.54
2031	28.48	28.59	28.38	27.14	27.24	27.34	27.45	27.55	27.66	28.02	29.37	29.48	28.05
2032	30.21	30.33	30.10	28.96	29.07	29.19	29.30	29.42	29.53	30.01	31.42	31.54	29.92
2033	32.36	32.49	32.53	31.33	31.46	31.58	31.71	31.84	31.97	32.32	34.57	34.71	32.41
2034	35.58	35.73	35.86	34.58	34.72	34.87	35.01	35.16	35.31	36.06	39.05	39.65	35.97
2035	40.64	40.82	40.96	39.55	39.72	39.90	40.07	40.24	40.42	41.29	42.78	42.96	40.78
2036	44.04	44.21	43.00	41.54	41.72	41.90	42.08	42.27	42.46	43.49	45.32	45.51	43.12
2037	46.68	46.88	45.92	44.39	44.58	44.78	44.98	45.18	45.38	46.72	48.74	48.95	46.10
2038	50.20	50.43	49.55	47.92	48.13	48.35	48.57	48.79	49.01	50.15	52.22	52.45	49.64
2039	53.78	54.01	51.56	49.88	50.11	50.34	50.56	50.79	51.03	52.25	54.37	54.61	51.93
2040	57.01	55.99	54.52	52.79	53.02	53.26	53.49	53.74	53.98	54.90	56.49	56.74	54.66
2041	58.22	57.19	55.69	53.92	54.16	54.40	54.64	54.89	55.14	56.08	57.70	57.95	55.83
2042	59.46	58.40	56.87	55.07	55.31	55.56	55.80	56.05	56.31	57.27	58.92	59.18	57.01
2043	60.72	59.64	58.08	56.24	56.48	56.74	56.99	57.25	57.50	58.48	60.17	60.44	58.22
2044	62.01	60.91	59.31	57.44	57.69	57.95	58.20	58.46	58.73	59.73	61.45	61.72	59.46
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
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34	
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11	25.08
2021	17.16	16.80	15.80	14.18	14.00	14.25	14.51	14.61	14.59	14.75	16.48	17.63	15.39
2022	18.62	18.26	17.64	15.25	15.10	15.29	15.50	15.57	15.52	15.69	17.43	18.43	16.51
2023	19.40	19.07	18.51	16.96	16.88	17.12	17.37	17.50	17.54	17.74	18.56	19.56	18.01
2024	19.33	19.39	19.45	18.93	19.02	19.08	19.15	19.21	19.28	19.35	20.33	20.40	19.41
2025	21.03	21.10	21.16	20.29	20.35	20.37	20.44	20.51	20.58	20.65	21.56	21.63	20.81
2026	22.17	21.94	21.97	21.10	21.17	21.24	21.31	21.39	21.47	21.54	22.61	22.69	21.72
2027	23.23	23.22	22.39	21.47	21.54	21.45	21.52	21.60	21.68	21.84	22.77	22.84	22.12
2028	23.36	22.82	22.59	21.65	21.72	21.80	21.88	21.95	22.03	22.14	23.22	23.30	22.37
2029	23.93	24.01	24.06	23.11	23.19	23.28	24.39	24.48	24.57	24.82	25.97	26.06	24.33
2030	26.81	26.91	26.81	25.76	25.86	25.96	26.05	26.15	26.25	26.42	27.67	27.78	26.53
2031	28.48	28.59	28.38	27.14	27.24	27.34	27.45	27.55	27.66	28.02	29.37	29.48	28.06
2032	30.21	30.33	30.10	28.96	29.07	29.19	29.30	29.42	29.53	30.01	31.42	31.54	29.92
2033	32.36	32.49	32.53	31.33	31.46	31.58	31.71	31.84	31.97	32.32	34.57	34.71	32.40
2034	35.58	35.73	35.86	34.58	34.72	34.87	35.01	35.16	35.31	36.06	39.05	39.65	35.95
2035	40.64	40.82	40.96	39.55	39.72	39.90	40.07	40.24	40.42	41.29	42.78	42.96	40.78
2036	44.04	44.21	43.00	41.54	41.72	41.90	42.08	42.27	42.46	43.49	45.32	45.51	43.12
2037	46.68	46.88	45.92	44.39	44.58	44.78	44.98	45.18	45.38	46.72	48.74	48.95	46.10
2038	50.20	50.43	49.55	47.92	48.13	48.35	48.57	48.79	49.01	50.15	52.22	52.45	49.65
2039	53.78	54.01	51.56	49.88	50.11	50.34	50.56	50.79	51.03	52.25	54.37	54.61	51.93
2040	57.01	55.99	54.52	52.79	53.02	53.26	53.49	53.74	53.98	54.90	56.49	56.74	54.66
2041	58.22	57.19	55.69	53.92	54.16	54.40	54.64	54.89	55.14	56.08	57.70	57.95	55.83
2042	59.46	58.40	56.87	55.07	55.31	55.56	55.80	56.05	56.31	57.27	58.92	59.18	57.01
2043	60.72	59.64	58.08	56.24	56.48	56.74	56.99	57.25	57.50	58.48	60.17	60.44	58.22
2044	62.01	60.91	59.31	57.44	57.69	57.95	58.20	58.46	58.73	59.73	61.45	61.72	59.46







Portland General Electric													
Avoided Cost Study													
Total Projected Avoided Fuel Costs													
Nominal \$/MWh													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2019	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	10.24	9.88	8.89	7.27	7.09	7.34	7.59	7.70	7.67	7.84	9.57	10.72	8.48
2022	11.58	11.22	10.59	8.20	8.05	8.24	8.45	8.53	8.47	8.65	10.39	11.39	9.47
2023	12.21	11.88	11.22	9.76	9.68	9.93	10.18	10.31	10.35	10.54	11.37	12.37	10.82
2024	12.00	12.06	12.12	11.60	11.69	11.75	11.82	11.88	11.95	12.02	13.00	13.07	12.08
2025	13.54	13.62	13.68	12.80	12.87	12.89	12.95	13.03	13.10	13.17	14.08	14.15	13.32
2026	14.53	14.30	14.34	13.46	13.54	13.61	13.68	13.76	13.83	13.91	14.97	15.05	14.08
2027	15.44	15.43	14.60	13.68	13.75	13.66	13.74	13.81	13.89	14.05	14.98	15.06	14.34
2028	15.43	14.88	14.65	13.72	13.79	13.87	13.94	14.02	14.10	14.21	15.29	15.37	14.44
2029	15.83	15.91	15.95	15.01	15.09	15.18	16.28	16.38	16.47	16.72	17.87	17.96	16.22
2030	18.55	18.65	18.55	17.50	17.59	17.69	17.79	17.89	17.99	18.16	19.41	19.51	18.27
2031	20.05	20.16	19.96	18.71	18.81	18.92	19.02	19.13	19.23	19.59	20.94	21.05	19.63
2032	21.62	21.74	21.51	20.37	20.49	20.60	20.71	20.83	20.95	21.42	22.83	22.95	21.34
2033	23.60	23.72	23.76	22.56	22.69	22.81	22.94	23.07	23.20	23.56	25.80	25.94	23.64
2034	26.64	26.79	26.92	25.64	25.78	25.92	26.07	26.21	26.36	27.12	30.10	30.70	27.02
2035	31.52	31.69	31.84	30.43	30.60	30.77	30.94	31.12	31.30	32.17	33.65	33.84	31.66
2036	34.74	34.92	33.71	32.25	32.42	32.61	32.79	33.16	33.33	34.20	36.02	36.22	33.83
2037	37.18	37.39	36.43	34.90	35.09	35.29	35.48	35.69	35.89	37.23	39.25	39.46	36.60
2038	40.52	40.75	39.87	38.24	38.45	38.67	38.89	39.11	39.33	40.47	42.54	42.77	39.96
2039	43.91	44.14	41.69	40.01	40.23	40.46	40.69	40.92	41.15	42.37	44.49	44.73	42.06
2040	46.95	45.93	44.46	42.73	42.96	43.20	43.44	43.68	43.92	44.84	46.43	46.68	44.60
2041	47.95	46.92	45.42	43.65	43.89	44.13	44.37	44.62	44.87	45.80	47.43	47.68	45.55
2042	48.98	47.93	46.39	44.59	44.83	45.08	45.32	45.58	45.83	46.79	48.44	48.70	46.53
2043	50.03	48.96	47.39	45.55	45.80	46.05	46.30	46.56	46.82	47.80	49.49	49.75	47.54
2044	51.11	50.01	48.41	46.53	46.78	47.04	47.30	47.56	47.83	48.82	50.55	50.82	48.56



## **Standard Capacity Tables**







UM 2001

Enhanced Update to Schedule 201  
Avoided Cost Power Purchase Information

Attachment B  
Summary of Renewable Avoided Costs



## **Renewable Energy Tables**

PGE's 2018 Renewable AVOIDED COST ENHANCED UPDATE  
SUMMARY TABLES – Page 3

Portland General Electric Renewable Avoided Cost Study On-Peak Energy, Base Load													Nominal \$/MWh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49	
2020	38.74	35.53	26.79	22.36	21.63	27.26	51.38	60.63	42.57	29.58	30.04	36.10	35.30
2021	40.91	38.88	29.06	25.25	22.00	31.53	57.66	71.95	40.89	30.07	30.33	40.86	38.36
2022	41.56	39.50	29.54	25.68	22.39	32.05	58.55	73.05	41.54	30.57	30.83	41.51	38.93
2023	45.83	43.54	32.48	28.20	24.54	35.27	64.68	80.76	45.80	33.63	33.91	45.76	42.96
2024	49.08	46.62	34.76	30.16	26.24	37.75	69.31	86.57	49.05	35.99	36.30	49.01	45.98
2025	65.73	61.45	57.62	46.06	40.12	25.01	50.73	57.68	63.63	63.68	64.92	68.80	55.51
2026	67.05	62.68	58.78	46.98	40.92	25.51	51.74	58.83	64.90	64.96	66.22	70.17	56.63
2027	68.39	63.93	59.95	47.92	41.74	26.02	52.77	60.01	66.20	66.25	67.54	71.58	57.71
2028	69.56	65.03	60.98	48.75	42.46	26.46	53.68	61.04	67.34	67.39	68.70	72.81	58.68
2029	71.15	66.52	62.37	49.86	43.42	27.07	54.90	62.43	68.87	68.93	70.27	74.46	59.99
2030	72.57	67.84	63.62	50.85	44.29	27.61	56.00	63.68	70.25	70.31	71.67	75.95	61.21
2031	74.02	69.20	64.89	51.87	45.18	28.16	57.12	64.95	71.65	71.71	73.10	77.47	62.48
2032	75.29	70.39	66.00	52.76	45.95	28.64	58.10	66.07	72.89	72.95	74.36	78.80	63.59
2033	77.01	71.99	67.51	53.96	47.00	29.30	59.43	67.58	74.55	74.61	76.06	80.60	65.02
2034	78.55	73.43	68.86	55.04	47.94	29.88	60.61	68.93	76.04	76.10	77.58	82.21	66.28
2035	80.12	74.90	70.23	56.14	48.90	30.48	61.83	70.30	77.56	77.62	79.13	83.85	67.53
2036	81.49	76.19	71.44	57.11	49.74	31.00	62.89	71.51	78.89	78.95	80.49	85.29	68.74
2037	83.35	77.92	73.07	58.41	50.87	31.71	64.32	73.14	80.69	80.75	82.32	87.24	70.42
2038	85.02	79.48	74.53	59.57	51.89	32.34	65.61	74.60	82.30	82.37	83.97	88.98	71.74
2039	86.71	81.07	76.02	60.77	52.92	32.99	66.92	76.09	83.94	84.01	85.64	90.76	73.15
2040	88.21	82.46	77.32	61.81	53.83	33.56	68.07	77.40	85.39	85.46	87.12	92.32	74.44
2041	90.22	84.34	79.09	63.22	55.06	34.32	69.62	79.17	87.33	87.40	89.10	94.42	76.07
2042	92.02	86.03	80.67	64.48	56.16	35.01	71.01	80.75	89.08	89.15	90.88	96.31	77.68
2043	93.86	87.75	82.28	65.77	57.28	35.71	72.43	82.36	90.86	90.93	92.70	98.23	79.27
2044	95.47	89.26	83.69	66.90	58.27	36.32	73.68	83.78	92.42	92.50	94.29	99.92	80.57
<b>Capacity Removed, Aurora Shaping</b>													
Portland General Electric Renewable Avoided Cost Study Off-Peak Energy, Base Load													Nominal \$/MWh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34	
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11	25.08
2021	37.66	33.33	24.21	20.10	14.80	16.81	28.76	35.86	31.57	26.26	27.02	37.62	27.80
2022	39.53	34.99	25.41	21.09	15.52	17.64	30.18	37.65	33.14	27.56	28.36	39.49	29.23
2023	42.17	37.30	27.04	22.40	16.44	18.71	32.15	40.15	35.32	29.34	30.20	42.13	31.09
2024	44.93	39.73	28.78	23.83	17.46	19.88	34.23	42.77	37.62	31.24	32.15	44.88	33.18
2025	58.19	53.34	52.60	43.71	37.09	21.11	44.24	52.02	56.40	57.61	60.55	62.65	49.95
2026	59.35	54.40	53.65	44.59	37.83	21.53	45.13	53.06	57.52	58.76	61.76	63.90	50.92
2027	60.53	55.49	54.72	45.48	38.59	21.96	46.03	54.12	58.67	59.94	62.99	65.18	52.00
2028	61.58	56.45	55.67	46.26	39.25	22.34	46.82	55.05	59.68	60.97	64.07	66.30	52.91
2029	62.98	57.73	56.93	47.31	40.14	22.85	47.89	56.31	61.04	62.36	65.53	67.81	54.18
2030	64.24	58.89	58.07	48.26	40.95	23.31	48.85	57.43	62.26	63.60	66.84	69.17	55.21
2031	65.52	60.06	59.23	49.22	41.76	23.77	49.82	58.58	63.51	64.87	68.18	70.55	56.24
2032	66.65	61.10	60.25	50.07	42.48	24.18	50.68	59.59	64.60	65.99	69.35	71.76	57.18
2033	68.17	62.49	61.62	51.21	43.45	24.73	51.83	60.95	66.07	67.49	70.93	73.40	58.54
2034	69.53	63.74	62.85	52.23	44.32	25.23	52.87	62.16	67.39	68.84	72.35	74.87	59.70
2035	70.92	65.01	64.11	53.28	45.20	25.73	53.92	63.41	68.74	70.22	73.80	76.36	61.00
2036	72.14	66.13	65.21	54.19	45.98	26.17	54.85	64.50	69.92	71.42	75.06	77.67	62.00
2037	73.78	67.63	66.70	55.43	47.03	26.77	56.10	65.97	71.51	73.05	76.77	79.44	63.31
2038	75.25	68.99	68.03	56.54	47.97	27.30	57.22	67.28	72.94	74.51	78.31	81.03	64.65
2039	76.76	70.36	69.39	57.66	48.93	27.85	58.37	68.63	74.40	76.00	79.87	82.65	65.96
2040	78.08	71.57	70.59	58.66	49.77	28.33	59.37	69.81	75.68	77.31	81.25	84.07	67.05
2041	79.86	73.20	72.19	59.99	50.90	28.97	60.72	71.40	77.40	79.07	83.10	85.99	68.69
2042	81.45	74.67	73.64	61.19	51.92	29.55	61.94	72.83	78.95	80.65	84.76	87.71	69.92
2043	83.08	76.16	75.11	62.41	52.96	30.14	63.17	74.28	80.53	82.26	86.45	89.46	71.28
2044	84.51	77.47	76.40	63.49	53.87	30.66	64.26	75.56	81.91	83.67	87.94	91.00	72.60
<b>Capacity Removed, Aurora Shaping</b>													

PGE's 2018 Renewable AVOIDED COST ENHANCED UPDATE  
SUMMARY TABLES – Page 4

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
2019	40.36	38.32	28.38	24.56	21.25	30.93	57.43	71.96	40.36	29.40	29.66	40.61	
2020	37.84	34.63	25.89	21.46	20.73	26.36	50.48	59.73	41.67	28.68	29.14	35.20	34.40
2021	39.99	37.96	28.14	24.33	21.08	30.61	56.74	71.03	39.97	29.15	29.41	39.94	37.44
2022	40.62	38.56	28.60	24.74	21.45	31.11	57.61	72.11	40.60	29.63	29.89	40.57	37.99
2023	44.87	42.58	31.52	27.24	23.58	34.31	63.72	79.80	44.84	32.67	32.95	44.80	42.00
2024	48.10	45.64	33.78	29.18	25.26	36.77	68.33	85.59	48.07	35.01	35.32	48.03	45.00
2025	64.73	60.45	56.62	45.06	39.12	24.01	49.73	56.68	62.63	62.68	63.92	67.80	54.51
2026	66.03	61.66	57.76	45.96	39.90	24.49	50.72	57.81	63.88	63.94	65.20	69.15	55.61
2027	67.35	62.89	58.91	46.88	40.70	24.98	51.73	58.97	65.16	65.21	66.50	70.54	56.67
2028	68.50	63.97	59.92	47.69	41.40	25.40	52.62	59.98	66.28	66.33	67.64	71.75	57.62
2029	70.07	65.44	61.29	48.78	42.34	25.99	53.82	61.35	67.79	67.85	69.19	73.38	58.91
2030	71.47	66.74	62.52	49.75	43.19	26.51	54.90	62.58	69.15	69.21	70.57	74.85	60.11
2031	72.90	68.08	63.77	50.75	44.06	27.04	56.00	63.83	70.53	70.59	71.98	76.35	61.36
2032	74.15	69.25	64.86	51.62	44.81	27.50	56.96	64.93	71.75	71.81	73.22	77.66	62.45
2033	75.84	70.82	66.34	52.79	45.83	28.13	58.26	66.41	73.38	73.44	74.89	79.43	63.85
2034	77.36	72.24	67.67	53.85	46.75	28.69	59.42	67.74	74.85	74.91	76.39	81.02	65.09
2035	78.91	73.69	69.02	54.93	47.69	29.27	60.62	69.09	76.35	76.41	77.92	82.64	66.32
2036	80.25	74.95	70.20	55.87	48.50	29.76	61.65	70.27	77.65	77.71	79.25	84.05	67.50
2037	82.09	76.66	71.81	57.15	49.61	30.45	63.06	71.88	79.43	79.49	81.06	85.98	69.16
2038	83.73	78.19	73.24	58.28	50.60	31.05	64.32	73.31	81.01	81.08	82.68	87.69	70.45
2039	85.40	79.76	74.71	59.46	51.61	31.68	65.61	74.78	82.63	82.70	84.33	89.45	71.84
2040	86.87	81.12	75.98	60.47	52.49	32.22	66.73	76.06	84.05	84.12	85.78	90.98	73.10
2041	88.85	82.97	77.72	61.85	53.69	32.95	68.25	77.80	85.96	86.03	87.73	93.05	74.70
2042	90.63	84.64	79.28	63.09	54.77	33.62	69.62	79.36	87.69	87.76	89.49	94.92	76.29
2043	92.44	86.33	80.86	64.35	55.86	34.29	71.01	80.94	89.44	89.51	91.28	96.81	77.85
2044	94.02	87.81	82.24	65.45	56.82	34.87	72.23	82.33	90.97	91.05	92.84	98.47	79.12
<b>Capacity Removed, Aurora Shaping, Integration Removed</b>													
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
2019	36.79	32.46	23.29	19.21	13.86	15.89	27.87	35.01	30.68	25.32	26.09	32.46	
2020	33.69	28.83	22.85	14.13	12.08	12.53	25.03	31.37	29.73	25.12	25.68	29.21	24.18
2021	36.74	32.41	23.29	19.18	13.88	15.89	27.84	34.94	30.65	25.34	26.10	36.70	26.88
2022	38.59	34.05	24.47	20.15	14.58	16.70	29.24	36.71	32.20	26.62	27.42	38.55	28.29
2023	41.21	36.34	26.08	21.44	15.48	17.75	31.19	39.19	34.36	28.38	29.24	41.17	30.13
2024	43.95	38.75	27.80	22.85	16.48	18.90	33.25	41.79	36.64	30.26	31.17	43.90	32.20
2025	57.19	52.34	51.60	42.71	36.09	20.11	43.24	51.02	55.40	56.61	59.55	61.65	48.95
2026	58.33	53.38	52.63	43.57	36.81	20.51	44.11	52.04	56.50	57.74	60.74	62.88	49.90
2027	59.49	54.45	53.68	44.44	37.55	20.92	44.99	53.08	57.63	58.90	61.95	64.14	50.96
2028	60.52	55.39	54.61	45.20	38.19	21.28	45.76	53.99	58.62	59.91	63.01	65.24	51.85
2029	61.90	56.65	55.85	46.23	39.06	21.77	46.81	55.23	59.96	61.28	64.45	66.73	53.10
2030	63.14	57.79	56.97	47.16	39.85	22.21	47.75	56.33	61.16	62.50	65.74	68.07	54.11
2031	64.40	58.94	58.11	48.10	40.64	22.65	48.70	57.46	62.39	63.75	67.06	69.43	55.12
2032	65.51	59.96	59.11	48.93	41.34	23.04	49.54	58.45	63.46	64.85	68.21	70.62	56.04
2033	67.00	61.32	60.45	50.04	42.28	23.56	50.66	59.78	64.90	66.32	69.76	72.23	57.37
2034	68.34	62.55	61.66	51.04	43.13	24.04	51.68	60.97	66.20	67.65	71.16	73.68	58.51
2035	69.71	63.80	62.90	52.07	43.99	24.52	52.71	62.20	67.53	69.01	72.59	75.15	59.79
2036	70.90	64.89	63.97	52.95	44.74	24.93	53.61	63.26	68.68	70.18	73.82	76.43	60.76
2037	72.52	66.37	65.44	54.17	45.77	25.51	54.84	64.71	70.25	71.79	75.51	78.18	62.05
2038	73.96	67.70	66.74	55.25	46.68	26.01	55.93	65.99	71.65	73.22	77.02	79.74	63.36
2039	75.45	69.05	68.08	56.35	47.62	26.54	57.06	67.32	73.09	74.69	78.56	81.34	64.65
2040	76.74	70.23	69.25	57.32	48.43	26.99	58.03	68.47	74.34	75.97	79.91	82.73	65.71
2041	78.49	71.83	70.82	58.62	49.53	27.60	59.35	70.03	76.03	77.70	81.73	84.62	67.32
2042	80.06	73.28	72.25	59.80	50.53	28.16	60.55	71.44	77.56	79.26	83.37	86.32	68.53
2043	81.66	74.74	73.69	60.99	51.54	28.72	61.75	72.86	79.11	80.84	85.03	88.04	69.86
2044	83.06	76.02	74.95	62.04	52.42	29.21	62.81	74.11	80.46	82.22	86.49	89.55	71.15
<b>Capacity Removed, Aurora Shaping, Integration Removed</b>													

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Portland General Electric Renewable Avoided Cost Study On-Peak Energy, Solar														Nominal \$/MWh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
2019	41.24	39.20	29.26	25.44	22.13	31.81	58.31	72.84	41.24	30.28	30.54	41.49		
2020	38.74	35.53	26.79	22.36	21.63	27.26	51.38	60.63	42.57	29.58	30.04	36.10	35.30	
2021	40.91	38.88	29.06	25.25	22.00	31.53	57.66	71.95	40.89	30.07	30.33	40.86	38.36	
2022	41.56	39.50	29.54	25.68	22.39	32.05	58.55	73.05	41.54	30.57	30.83	41.51	38.93	
2023	45.83	43.54	32.48	28.20	24.54	35.27	64.68	80.76	45.80	33.63	33.91	45.76	42.96	
2024	49.08	46.62	34.76	30.16	26.24	37.75	69.31	86.57	49.05	35.99	36.30	49.01	45.98	
2025	65.73	61.45	57.62	46.06	40.12	25.01	50.73	57.68	63.63	63.68	64.92	68.80	55.51	
2026	67.05	62.68	58.78	46.98	40.92	25.51	51.74	58.83	64.90	64.96	66.22	70.17	56.63	
2027	68.39	63.93	59.95	47.92	41.74	26.02	52.77	60.01	66.20	66.25	67.54	71.58	57.71	
2028	69.56	65.03	60.98	48.75	42.46	26.46	53.68	61.04	67.34	67.39	68.70	72.81	58.68	
2029	71.15	66.52	62.37	49.86	43.42	27.07	54.90	62.43	68.87	68.93	70.27	74.46	59.99	
2030	72.57	67.84	63.62	50.85	44.29	27.61	56.00	63.68	70.25	70.31	71.67	75.95	61.21	
2031	74.02	69.20	64.89	51.87	45.18	28.16	57.12	64.95	71.65	71.71	73.10	77.47	62.48	
2032	75.29	70.39	66.00	52.76	45.95	28.64	58.10	66.07	72.89	72.95	74.36	78.80	63.59	
2033	77.01	71.99	67.51	53.96	47.00	29.30	59.43	67.58	74.55	74.61	76.06	80.60	65.02	
2034	78.55	73.43	68.86	55.04	47.94	29.88	60.61	68.93	76.04	76.10	77.58	82.21	66.28	
2035	80.12	74.90	70.23	56.14	48.90	30.48	61.83	70.30	77.56	77.62	79.13	83.85	67.53	
2036	81.49	76.19	71.44	57.11	49.74	31.00	62.89	71.51	78.89	78.95	80.49	85.29	68.74	
2037	83.35	77.92	73.07	58.41	50.87	31.71	64.32	73.14	80.69	80.75	82.32	87.24	70.42	
2038	85.02	79.48	74.53	59.57	51.89	32.34	65.61	74.60	82.30	82.37	83.97	88.98	71.74	
2039	86.71	81.07	76.02	60.77	52.92	32.99	66.92	76.09	83.94	84.01	85.64	90.76	73.15	
2040	88.21	82.46	77.32	61.81	53.83	33.56	68.07	77.40	85.39	85.46	87.12	92.32	74.44	
2041	90.22	84.34	79.09	63.22	55.06	34.32	69.62	79.17	87.33	87.40	89.10	94.42	76.07	
2042	92.02	86.03	80.67	64.48	56.16	35.01	71.01	80.75	89.08	89.15	90.88	96.31	77.68	
2043	93.86	87.75	82.28	65.77	57.28	35.71	72.43	82.36	90.86	90.93	92.70	98.23	79.27	
2044	95.47	89.26	83.69	66.90	58.27	36.32	73.68	83.78	92.42	92.50	94.29	99.92	80.57	
<i>Capacity Removed, Aurora Shaping, Integration Removed</i>														
Portland General Electric Renewable Avoided Cost Study Off-Peak Energy, Solar														Nominal \$/MWh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
2019	37.67	33.34	24.17	20.09	14.74	16.77	28.75	35.89	31.56	26.20	26.97	33.34		
2020	34.59	29.73	23.75	15.03	12.98	13.43	25.93	32.27	30.63	26.02	26.58	30.11	25.08	
2021	37.66	33.33	24.21	20.10	14.80	16.81	28.76	35.86	31.57	26.26	27.02	37.62	27.80	
2022	39.53	34.99	25.41	21.09	15.52	17.64	30.18	37.65	33.14	27.56	28.36	39.49	29.23	
2023	42.17	37.30	27.04	22.40	16.44	18.71	32.15	40.15	35.32	29.34	30.20	42.13	31.09	
2024	44.93	39.73	28.78	23.83	17.46	19.88	34.23	42.77	37.62	31.24	32.15	44.88	33.18	
2025	58.19	53.34	52.60	43.71	37.09	21.11	44.24	52.02	56.40	57.61	60.55	62.65	49.95	
2026	59.35	54.40	53.65	44.59	37.83	21.53	45.13	53.06	57.52	58.76	61.76	63.90	50.92	
2027	60.53	55.49	54.72	45.48	38.59	21.96	46.03	54.12	58.67	59.94	62.99	65.18	52.00	
2028	61.58	56.45	55.67	46.26	39.25	22.34	46.82	55.05	59.68	60.97	64.07	66.30	52.91	
2029	62.98	57.73	56.93	47.31	40.14	22.85	47.89	56.31	61.04	62.36	65.53	67.81	54.18	
2030	64.24	58.89	58.07	48.26	40.95	23.31	48.85	57.43	62.26	63.60	66.84	69.17	55.21	
2031	65.52	60.06	59.23	49.22	41.76	23.77	49.82	58.58	63.51	64.87	68.18	70.55	56.24	
2032	66.65	61.10	60.25	50.07	42.48	24.18	50.68	59.59	64.60	65.99	69.35	71.76	57.18	
2033	68.17	62.49	61.62	51.21	43.45	24.73	51.83	60.95	66.07	67.49	70.93	73.40	58.54	
2034	69.53	63.74	62.85	52.23	44.32	25.23	52.87	62.16	67.39	68.84	72.35	74.87	59.70	
2035	70.92	65.01	64.11	53.28	45.20	25.73	53.92	63.41	68.74	70.22	73.80	76.36	61.00	
2036	72.14	66.13	65.21	54.19	45.98	26.17	54.85	64.50	69.92	71.42	75.06	77.67	62.00	
2037	73.78	67.63	66.70	55.43	47.03	26.77	56.10	65.97	71.51	73.05	76.77	79.44	63.31	
2038	75.25	68.99	68.03	56.54	47.97	27.30	57.22	67.28	72.94	74.51	78.31	81.03	64.65	
2039	76.76	70.36	69.39	57.66	48.93	27.85	58.37	68.63	74.40	76.00	79.87	82.65	65.96	
2040	78.08	71.57	70.59	58.66	49.77	28.33	59.37	69.81	75.68	77.31	81.25	84.07	67.05	
2041	79.86	73.20	72.19	59.99	50.90	28.97	60.72	71.40	77.40	79.07	83.10	85.99	68.69	
2042	81.45	74.67	73.64	61.19	51.92	29.55	61.94	72.83	78.95	80.65	84.76	87.71	69.92	
2043	83.08	76.16	75.11	62.41	52.96	30.14	63.17	74.28	80.53	82.26	86.45	89.46	71.28	
2044	84.51	77.47	76.40	63.49	53.87	30.66	64.26	75.56	81.91	83.67	87.94	91.00	72.60	
<i>Capacity Removed, Aurora Shaping, Integration Removed</i>														

PGE's 2018 Renewable AVOIDED COST ENHANCED UPDATE  
 SUMMARY TABLES – Page 6

<b>Portland General Electric</b>			
<b>Renewable Avoided Cost Study</b>			
<b>Integration Costs</b>			
<b>Table R.4</b>	Nominal \$/MWh		
Year	Wind	Solar	
2019	0.88	-	
2020	0.90	-	
2021	0.92	-	
2022	0.94	-	
2023	0.96	-	
2024	0.98	-	
2025	1.00	-	
2026	1.02	-	
2027	1.04	-	
2028	1.06	-	
2029	1.08	-	
2030	1.10	-	
2031	1.12	-	
2032	1.14	-	
2033	1.17	-	
2034	1.19	-	
2035	1.21	-	
2036	1.24	-	
2037	1.26	-	
2038	1.29	-	
2039	1.31	-	
2040	1.34	-	
2041	1.37	-	
2042	1.39	-	
2043	1.42	-	
2044	1.45	-	



Portland General Electric												
Renewable AVOIDED Cost Study												
Deficiency Period: Value of Wind Capacity, Flat \$/MWh												
Table R.7												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06
2026	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18
2027	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
2028	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42
2029	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56
2030	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69
2031	6.83	6.83	6.83	6.83	6.83	6.83	6.83	6.83	6.83	6.83	6.83	6.83
2032	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94
2033	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10
2034	7.24	7.24	7.24	7.24	7.24	7.24	7.24	7.24	7.24	7.24	7.24	7.24
2035	7.39	7.39	7.39	7.39	7.39	7.39	7.39	7.39	7.39	7.39	7.39	7.39
2036	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52
2037	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69
2038	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
2039	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
2040	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14
2041	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.32
2042	8.49	8.49	8.49	8.49	8.49	8.49	8.49	8.49	8.49	8.49	8.49	8.49
2043	8.66	8.66	8.66	8.66	8.66	8.66	8.66	8.66	8.66	8.66	8.66	8.66
2044	8.81	8.81	8.81	8.81	8.81	8.81	8.81	8.81	8.81	8.81	8.81	8.81

Nominal \$/MWh





## **Renewable Capacity Tables**







UM 2001

Enhanced Update to Schedule 201  
Avoided Cost Power Purchase Information

Attachment C

**Workbook tab: Plant Capital Cost Inputs**

	3-11-18 Filing				5-1-18 Filing	
	Value	Units	\$ Year	Source	Value	\$ Year
<b>SCCT (1x0 FE 7F.05):</b>						
Clean Capacity	231	MW		2016 IRP Update Appendix A	231	
Degraded Capacity	218	MW		2016 IRP Update Appendix A	218	
Overnight capital cost	122,770	(\$000s)	2018	2019 IRP Supply Side Options Study	143,696	2017
CO2 offset	3,172	(\$000s)	2017	2016 IRP Update Appendix C	3,172	
Economic life	38	yrs.		2016 IRP Update, Section 7	38	
Tax life	15	yrs.		No change	15	
Decommissioning cost	1,379	(\$000s)	2017	2016 IRP Update Appendix A	1,379	
In-service date	2021			No change	2021	
Start construction date	2019			No change	2019	
EPC period	24	months		No change	24	
<b>CCCT Production Equipment (1x1 GE 7HA.01):</b>						
Clean Capacity	424	MW		2016 IRP Update Appendix A	424	
Degraded Capacity	400	MW		2016 IRP Update Appendix A	400	
Overnight capital cost	384,312	(\$000s)	2018	2019 IRP Supply Side Options Study	562,835	2017
CO2 offset	6,755	(\$000s)	2017	2016 IRP Update Appendix C	6,755	
Economic life	38	yrs.		2016 IRP Update, Section 7	38	
Tax life	20			No change	20	
Decommissioning cost	9,798	(\$000s)	2017	2016 IRP Update Appendix A	9,798	
In-service date	2021			No change	2021	
Start construction date	2018			No change	2018	
EPC period	30	months		No change	30	
<b>Wind Equipment (Gorge wind):</b>						
Capacity	332	MW		2016 IRP Update Table 7	332	
Turbines	166	turbines		2016 IRP Update Appendix B	166	
Overnight capital cost	496,174	(\$000s)	2018	2019 IRP Supply Side Options Study	457,088	2017
Annual capital reinvestment	12,500	\$/MW	2017	2016 IRP Update Appendix B	12,500	2017
Economic life	30			2016 IRP Update, Section 7	30	
Tax life	5			No change	5	
Decommissioning cost	0			No change	0	
In-service date	2025			No change	2025	
Start construction date	2023			No change	2023	
EPC period	16	months		No change	16	
Plant retirement	2054			No change	2054	

**Workbook tab: Plant Operating Parameters**

	3-11-18 Filing				5-1-18 Filing	
	Value	Units	\$ Year	Source	Value	\$ Year
<b>SCCT 1x0 GE 7F.05</b>						
Heat Rate (Degraded)	10,170	Btu/kWh		IRP Update Appendix A	10,170	
Fixed O&M	2.10	\$/kW-yr	2018	2019 IRP Supply Side Options Study	7.10	2017
Variable O&M	7.31	\$/MWh	2017	Appendix A, new&clean converted to degr.	7.31	2017
<b>CCCT 1x1 GE FHA.01</b>						
Heat Rate (Degraded)	6,450	Btu/kWh		IRP Update Appendix A	6,450	
Fixed O&M	6.57	\$/kW-yr	2018	2019 IRP Supply Side Options Study	7.84	2017
Variable O&M	3.50	\$/MWh	2017	Appendix A, new&clean converted to degr.	3.50	2017
Availability factor	90.43%	%		2016 IRP Update Table 7	90.43%	
Start up costs	950	MMBtu/start		No change	950	
<b>Gorge Wind</b>						
Fixed O&M	37.00	\$/kW-yr	2018	2019 IRP Supply Side Options Study	33.00	2017
Capacity factor (flat)	40.80%			2019 IRP Supply Side Options Study	35.00%	
Capacity factor (peak)	35.24%			No change	35.24%	
Annual output	1,186,595	MWh		calculation	1,017,912	
Land royalties	5.50	\$/kw-yr	2017	2016 IRP Update Appendix B	5.50	2017
Capacity contribution	16.73%			2016 IRP Update Appendix D	16.73%	
<b>Solar</b>						
Capacity factor (peak)	35.61%			2016 IRP, Section 5.1.5 (no change)	35.61%	
Capacity contribution	11.20%			2016 IRP Update; solar contracts as of Dec 2018	14.40%	
<b>BPA Line Loss</b>						
BPA line loss	1.9%			No change	1.9%	

**Workbook tab: Financial and Tax Parameters**

	3-11-18 Filing		5-1-18 Filing
	Value	Source	Value
Federal Income Tax Rate	21.00%	2016 IRP Update, Section 7	21.00%
State Income Tax Rate	7.69%	2016 IRP Update, Section 7	7.69%
Composite Income Tax Rate	27.08%	calculation	27.08%
Debt Portion of Capitalization	50.00%	2016 IRP Update, Section 7	50.00%
Common Stock Portion of Capitalization	50.00%	2016 IRP Update, Section 7	50.00%
Property Tax Rate	1.45%	2016 IRP Update, Section 7	1.45%
Inflation Rate	2.00%	2016 IRP Update, Section 7	2.00%
Common Return	9.50%	2016 IRP Update, Section 7	9.50%
Debt Return	4.97%	2016 IRP Update, Section 7	4.97%
Pre-Tax Nominal Cost of Capital	7.24%	calculation	7.24%
Equityportion	65.64%	calculation	65.64%
After-Tax Nominal Cost of Capital	6.56%	calculation	6.56%
After-Tax Real Cost of Capital	4.48%	calculation	4.48%

Summary Report

UM 2001 STAFF INVESTIGATION INTO INTERIM PURPA ACTION

Category: Miscellaneous

In the Matter of PUBLIC UTILITY COMMISSION OF OREGON, Investigation Into Interim PURPA Action.

Opened at 2/14/19 Public Meeting.

Filing Date: 2/14/2019

Case DRENNAN, TED  
ANDRUS, BRITTANY

Law Judge(s): MOSER, NOLAN 503-378-3098

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**Summary Report**

**UM 2001 STAFF INVESTIGATION INTO INTERIM PURPA ACTION**

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