

May 3, 2021

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

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

Pursuant to Oregon Administrative Rule (OAR) 860-029-0085 and Oregon Revised Statute (ORS) 758.525, Portland General Electric Company (PGE) submits this filing to revise its Schedule 201, Qualifying Facility Avoided Cost Power Purchase Information for Qualifying Facilities (QFs) 10 MW or Less, Sheet Nos. 201-1 through 201-25.

This filing revises PGE's Schedule 201 consistent with Order Nos. 11-505 and 14-058. In Order No. 14-058, the Commission directed electric utilities to update their avoided cost prices on May 1 every year. The annual update is limited to four factors:

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

OAR 860-029-0085(4)(c) allows updated avoided cost prices to be effective *within* 60 days of the May 1 filing. Accordingly, PGE respectfully requests an effective date of **June 16, 2021**.

On January 29, 2021, PGE filed its 2019 IRP Update in LC 73. PGE requested acknowledgment of its IRP Update for the purposes of more fully modifying its May 1 avoided cost price update. The Public Utility Commission of Oregon's (Commission or OPUC) review of the IRP update allowed for a robust public process in which key stakeholders participated, including OPUC Staff, Oregon Citizens' Utility Board, NW Energy Coalition, Renewable Northwest, Northwest and Intermountain Power Producers Coalition, Renewable Energy Coalition, NewSun Energy LLC, and Swan Lake North Hydro, LLC and Goldendale Energy Storage Project. These parties all filed comments and PGE responded to numerous data requests.

On April 20, 2021, the Commission acknowledged PGE's 2019 IRP Update at the special public meeting with the understanding that inputs impacting the avoided cost price change would continue to be discussed in this proceeding. In this filing, PGE requests incorporating information from PGE's IRP Update, which will result in more accurate avoided cost prices consistent with the customer-indifference standard.

<sup>&</sup>lt;sup>1</sup> No PTC changes due to no changes in sufficiency/deficiency date.

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The major drivers for the changes to PGE's Schedule 201 prices<sup>2</sup> are as follows:

- Updated Natural Gas Prices. For both Standard and Renewable Avoided Costs, forward natural gas prices have increased.
- **On- and off-peak forward-looking electricity market prices**. For both Standard and Renewable Avoided Costs, forward electricity prices have increased during the sufficiency period.
- Updated Effective Load Carrying Capability (ELCC) Values. The ELCC values were updated to align with the IRP Update. The largest impact was to the solar ELCC value, which declined primarily due to the increase in solar resource in the Baseline Portfolio.
- Updated Simple-Cycle Combustion Turbine (SCCT) Net Energy Value. The net energy value was updated to align with the IRP Update. The decrease in net energy value is driven primarily by lower forecasted long-term electricity prices relative to the 2019 IRP and corresponding resource dispatch.
- Updated Interconnection Cost. The resource costs in the IRP Update were updated to reflect the interconnection costs that are part of the current avoided cost pricing. This filing includes minor updates to more accurately capture actual inflation from 2013-2018 and the assumptions for the 10-year Treasury Note interest rates.
- Updated Combined-Cycle Combustion Turbine (CCCT) Annual Generation and Starts. This filing includes updated values for the CCCT annual starts and generation based on the dispatch from the IRP Update modeling. This update impacts non-renewable avoided cost prices only.

# A. The Inputs from the Acknowledged 2019 IRP Update Are Reasonable and Should be Approved as Part of PGE's Updated Avoided Cost Prices.

As part of this avoided cost price update, PGE has incorporated inputs from the acknowledged 2019 IRP Update. A brief overview of some inputs discussed below which were previously discussed in the 2019 IRP Update where parties and PGE provided comments on the reasonableness of these changes.

# 1. ELCC Values

The updated ELCC values for the solar, wind, and SCCT resources are included in this May1 filing. As discussed in PGE's reply comments in LC 73, the capacity contribution (or effective load carrying capability, ELCC) values for candidate resources were updated based on the same capacity assessment model used for the capacity need model for the 2019 IRP Update.<sup>3</sup> These results were provided in Section 5.3 of the 2019 IRP Update.<sup>4</sup>

As discussed in the IRP Update and PGE's reply comments in that proceeding, the findings of the ELCC study indicate that the primary driver in the decline of the solar ELCC value of the first incremental addition relative to the 2019 IRP is the increase in solar resources in the Baseline Portfolio. These results were shared with participants in the November 2020 Roundtable and align

<sup>&</sup>lt;sup>2</sup> The status of the federal PTC did not change and is not included as an update.

<sup>&</sup>lt;sup>3</sup> PGE 2019 Integrated Resource Plan (IRP), Docket No. LC 73, PGE Reply Comments at 15 (Mar. 24, 2021).

<sup>&</sup>lt;sup>4</sup> See Docket No. LC 73, PGE Reply Comments at 15.

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with the declining marginal ELCC values for solar from previous ELCC studies. The ELCC studies in the 2016 IRP, 2016 IRP Update, and 2019 IRP all found that the ELCC value of solar resources declined as more solar resources were added to the portfolio, which is consistent with the findings of this IRP Update.<sup>5</sup> In Staff's Report in the 2019 IRP Update proceeding, Staff found the solar ELCC values to be "an acceptable starting point" and discussed three inputs to the analysis: the executed qualifying facility contracts, the Community Solar Program (CSP), and the examination of a 2025 test year.<sup>6</sup> The treatment of the three items in the Baseline Portfolio for the ELCC aligns with modeling in the capacity need assessment and with PGE's long-term planning.

Parties were provided ample opportunity to review these proposed changes in the IRP Update proceeding, and PGE appreciates the thorough review of these modifications.

# 2. Voluntary Renewable Programs

This avoided cost update includes updated inputs from the 2019 IRP Update, including the CSP and PGE's Green Energy Affinity Rider (GEAR) resource as discussed below.

# a. CSP

The need and position assessments for the 2019 IRP Update included the approximately 93 MW from the CSP in the Baseline Portfolio, which is now incorporated into this avoided cost update. This "snapshot" also incorporated the anticipated QF contract terminations related to the Community Solar Settlement Agreement. As discussed in Section 4.3 of PGE's 2019 IRP Update reply comments, PGE found this to be the most appropriate treatment for long-term planning based on the information available at the time of analysis.<sup>7</sup> PGE's intention in long-term planning is to align our treatment of CSP with what we expect from the CSP's intent and goals, including the assumption that all capacity for the program will be allocated. In Staff's Report in LC 73, Staff supported PGE's treatment "as the best possible forecast as of this filing."<sup>8</sup>

# b. GEAR

In the 2019 IRP Update, the baseline portfolio for the capacity need assessment and ELCC study included the initial 162 MW solar resource for GEAR Phase 1, which was executed in November 2019. The remaining 138 MW of GEAR Phase 1 was not executed at the time of the analysis snapshot and was examined through a sensitivity analysis of a placeholder resource. On February 11, 2021, PGE announced that the Company had entered into a Power Purchase Agreement (PPA) for the generation from a solar facility to fill this remaining portion of GEAR Phase 1.<sup>9</sup> In the Staff Report, Staff commented that PGE should update the GEAR resource modeling in the Baseline Portfolio to reflect the contracted resource.<sup>10</sup> This should be included in the Baseline Portfolio in the next snapshot update and PGE intends to include it in the Baseline Portfolio for the analysis

<sup>&</sup>lt;sup>5</sup> Docket No. LC 73, PGE Reply Comments at 17.

<sup>&</sup>lt;sup>6</sup> Docket No. LC 73, Staff's Report at 12-13 (Apr. 6, 2021).

<sup>&</sup>lt;sup>7</sup> Docket No. LC 73, PGE Reply Comments at 9-11; *see also Community Solar Rulemaking (SB 1547)*, Docket No. AR 603, Order No. 17-232 at 13 (June 29, 2017).

<sup>&</sup>lt;sup>8</sup> Docket No. LC 73, Staff's Report at 7.

<sup>&</sup>lt;sup>9</sup> See: <u>https://portlandgeneral.com/news/2021-02-11-customer-participation-in-pges-green-future-impactprogram</u>.

<sup>&</sup>lt;sup>10</sup> Docket No. LC 73, Staff's Report at 4-5.

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for the upcoming RFP process.

# 3. Public Utility Regulatory Policies Act (PURPA) QF Contracts

This avoided cost filing includes updates based on QF assumptions from the 2019 IRP Update. PGE's approach to modeling QF contracts in the IRP Update is consistent with its approach in the 2019 IRP. PGE includes all executed PURPA QF contracts in the Baseline Portfolio. PGE continues to believe that this is the most appropriate approach for customers when considering long-term resource procurement or when contracting for avoided cost resources. PGE periodically updates the resource snapshot, capturing executions, terminations, and delays.

Parties provided comments in the IRP Update proceeding regarding PURPA QF contracts and the challenge of examining a changing portfolio of QF resources. In response to the argument that PGE should project a certain percentage of terminations, as PGE discussed in the IRP Update, PGE is concerned that past terminations may not provide a reasonable forecast of future terminations. Approximately 55% of PGE's QF contracts were executed from 2017 to 2021. As most QF contracts allow for four years to achieve Commercial Operation Date (COD), we anticipate most of these projects will come online this year, which will impact the current historical success rate of QFs coming online.

As noted in PGE's 2019 IRP Reply Comments, while PGE does not advocate for speculating on future termination rates, if it were to do so, then it would also need to speculate on future executions, renewals, and programs. For example, PGE currently has 602 MW of solar projects in its QF queue that are actively being negotiated, with an additional 200 MW of capacity approved for GEAR phase II. If PGE were to forecast terminations of currently executed QF agreements, it would be reasonable for PGE to also forecast a portion of new QFs into the solar baseline, and the GEAR phase II capacity, reducing the solar QF capacity value. This would result in a forecast based on opposing (terminations versus executions and renewal), highly speculative, and unsupported assumptions which would likely conflict.

PGE emphasizes that it expects that the Company and its bilateral counterparties will honor their contractual commitments, and believes that QF contracts should be held to the same standard. PGE customers have obligations to these contracts and no guarantee that any of them will be terminated. Additionally, adhering to the assumption that QFs are unlikely to achieve commercial operation would require corresponding changes to avoided cost calculations and QF contract terms. Currently, QFs are compensated for contributing capacity; however, if the utility cannot reasonably rely on an executed QF contract in its long-term planning, then avoided cost calculations should be adjusted accordingly.

# **B.** Conclusion

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

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

Attachment B provides a description of renewable avoided costs.

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

Please direct any questions regarding this filing to Santiago Beltran Laborde at (503) 464-7902.

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

Sincerely,

# \s\ Robert Macfarlane

Robert Macfarlane Manager, Pricing & Tariffs

Enclosures cc: Service List – UM 1728

#### 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.

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 <u>www.portlandgeneral.com</u>. 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.

#### **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 94.01% 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.

#### 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.

#### 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.

Except for As-Available Energy, 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 Net Output delivered in the On-Peak Period. Except for As-Available Energy, 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 1b, 2b, or 3b or the Off-Peak Renewable Avoided Costs pursuant to Tables 4b, 5b, or 6b for Net Output delivered in the Off-Peak Period. The Company will pay the Seller the As-Available Rate for all As-Available Energy delivered during the PPA Term.

## 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 3b, 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.

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

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 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 25.00%. The capacity contribution for Solar QF resources (Tables 3a and 3b) is assumed to be 5.50%.

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.

Prices paid to the Seller under the Standard Fixed Price Option for Solar QFs (Tables 3a and 3b) include a reduction for the solar integration costs in Table 7. However, if the Solar QF is outside of PGE's Balancing Authority Area as contemplated in the Commission's Order No. 14-058, the Seller is paid the solar integration charges in Table 7, in addition to the prices listed in Tables 3a and 3b, 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.

					1	TABLE 1						
						voided Co						
				Fix			Base Loa	d QF				
					Un-Pea	K Forecas	t (\$/MWH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	18.89	21.19	46.77	75.47	61.20	37.75	38.26	50.49
2022	46.52	41.43	31.23	22.57	18.14	21.04	46.01	60.79	52.64	34.11	35.58	43.89
2023	42.88	38.78	31.01	26.25	23.59	27.07	44.74	56.82	45.21	34.14	35.50	42.19
2024	42.98	38.88	31.12	26.36	23.69	27.17	44.84	56.93	45.32	34.25	35.60	42.30
2025	44.84	44.56	43.72	42.48	42.34	42.56	42.81	42.85	42.80	42.98	43.71	45.02
2026	46.38	46.47	46.54	45.66	45.74	45.82	45.90	45.99	46.07	46.16	47.17	47.25
2027	49.77	49.87	49.96	48.58	48.59	48.68	48.77	48.87	48.97	49.37	49.16	50.28
2028	51.40	51.51	51.43	49.02	49.11	49.20	49.29	49.40	49.49	49.59	50.74	50.84
2029	51.97	52.08	51.93	49.35	49.43	49.53	49.62	49.71	49.81	49.90	51.08	51.18
2030	52.33	52.43	52.52	50.50	50.59	50.68	50.78	50.88	50.98	51.07	52.25	52.39
2031	53.51	53.62	53.19	50.89	50.98	51.08	51.17	51.27	51.36	51.46	52.68	52.78
2032	53.77	53.88	53.98	52.52	52.62	52.72	52.82	52.92	53.03	53.13	54.40	54.51
2033	55.98	56.09	56.19	55.09	55.20	55.31	55.42	55.53	55.64	55.75	57.10	57.21
2034	58.35	58.47	58.59	57.44	57.56	57.67	57.79	57.91	58.04	58.16	59.55	59.67
2035	59.91	60.06	60.22	58.20	58.31	58.42	58.52	58.65	58.78	58.99	60.29	60.41
2036	63.14	63.26	63.18	59.14	59.26	59.38	59.50	59.62	59.75	59.87	61.33	61.45
2037	65.12	65.23	63.60	60.84	60.96	61.09	61.22	61.33	61.44	61.59	63.26	63.43
2038	64.00	64.12	64.09	62.83	62.96	63.10	63.24	63.37	63.50	63.64	65.33	65.47
2039	68.22	68.37	66.94	64.72	64.84	65.01	65.14	65.30	65.43	65.57	67.40	67.54
2040	68.43	68.46	68.41	67.11	67.23	67.40	67.56	67.69	67.85	67.99	73.32	73.53
2041	72.19	72.36	72.66	71.23	71.40	71.56	71.72	71.89	72.06	72.23	75.78	75.96
2042	80.02	80.22	77.02	75.30	75.48	75.66	75.84	76.03	76.23	76.41	79.35	79.56
2043	90.14	90.30	77.70	76.17	76.35	76.61	76.73	76.99	77.16	77.33	79.96	80.26
2044	83.55	83.42	80.91	79.36	79.62	79.76	79.95	80.24	80.43	80.56	84.78	85.10
2045	89.41	89.53	82.19	80.97	81.16	81.40	81.62	81.71	82.00	82.21	87.22	87.48
2046	94.96	95.02	84.28	82.75	82.98	83.16	83.36	83.75	83.79	84.03	91.01	91.28

		•		-		TABLE 1						
						voided Co						
				Fix	ed Price (			d QF				
					Оп-Реа	K Forecas	t (\$/MWH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	9.97	9.46	25.52	39.28	35.20	30.87	30.87	40.30
2022	38.37	34.29	28.17	16.97	9.15	11.95	26.61	35.78	34.37	28.26	29.72	34.96
2023	37.42	32.32	24.65	17.63	12.56	12.92	25.72	34.57	33.21	28.80	30.32	35.73
2024	37.74	32.61	24.89	17.82	12.73	13.09	25.97	34.87	33.50	29.07	30.60	36.04
2025	18.53	18.25	17.41	16.16	16.03	16.25	16.49	16.53	16.49	16.66	17.40	18.71
2026	19.53	19.62	19.69	18.81	18.89	18.97	19.05	19.14	19.22	19.31	20.31	20.40
2027	22.36	22.47	22.56	21.18	21.18	21.28	21.37	21.47	21.57	21.97	21.76	22.88
2028	23.44	23.54	23.47	21.06	21.15	21.24	21.33	21.43	21.53	21.63	22.78	22.87
2029	23.44	23.54	23.39	20.81	20.90	20.99	21.08	21.18	21.27	21.37	22.54	22.65
2030	23.20	23.31	23.40	21.38	21.47	21.56	21.66	21.76	21.86	21.95	23.13	23.27
2031	23.79	23.90	23.48	21.18	21.27	21.36	21.45	21.55	21.65	21.74	22.96	23.06
2032	23.64	23.74	23.84	22.39	22.49	22.59	22.69	22.79	22.89	22.99	24.27	24.37
2033	25.03	25.14	25.24	24.14	24.25	24.36	24.47	24.58	24.69	24.80	26.15	26.27
2034	26.67	26.78	26.91	25.76	25.87	25.99	26.11	26.23	26.35	26.47	27.87	27.99
2035	27.68	27.83	27.99	25.97	26.08	26.19	26.30	26.42	26.55	26.76	28.06	28.18
2036	30.36	30.48	30.40	26.36	26.48	26.60	26.72	26.84	26.96	27.09	28.54	28.67
2037	31.56	31.67	30.03	27.27	27.39	27.53	27.66	27.77	27.88	28.03	29.70	29.87
2038	29.75	29.87	29.84	28.58	28.71	28.85	28.99	29.12	29.25	29.39	31.08	31.22
2039	33.27	33.42	31.99	29.77	29.88	30.06	30.18	30.35	30.48	30.62	32.45	32.58
2040	32.76	32.79	32.74	31.44	31.57	31.73	31.89	32.02	32.18	32.33	37.65	37.86
2041	35.79	35.96	36.26	34.83	35.00	35.16	35.32	35.49	35.66	35.83	39.38	39.56
2042	42.87	43.08	39.88	38.15	38.34	38.52	38.70	38.89	39.08	39.26	42.21	42.41
2043	52.23	52.39	39.79	38.26	38.44	38.71	38.82	39.09	39.26	39.43	42.06	42.36
2044	44.99	44.87	42.35	40.80	41.06	41.20	41.39	41.68	41.87	42.00	46.22	46.54
2045	<mark>49.8</mark> 1	49.93	42.59	41.37	41.56	41.79	42.02	42.11	42.40	42.61	47.62	47.88
2046	54.67	54.73	44.00	42.47	42.69	42.88	43.08	43.47	43.51	43.74	50.73	51.00

						TABLE 2a	1					
						oided Co						
				F		e Option f		\F				
					On-Peak	Forecast	(\$/IVIVVH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	18.56	20.85	46.44	75.14	60.87	37.42	37.93	50.16
2022	46.18	41.09	30.89	22.23	17.81	20.70	45.67	60.46	52.30	33.77	35.24	43.55
2023	42.53	38.43	30.67	25.91	23.24	26.72	44.39	56.48	44.87	33.80	35.15	41.85
2024	42.63	38.53	30.76	26.00	23.34	26.82	44.49	56.57	44.96	33.90	35.25	41.94
2025	33.64	33.36	32.52	31.27	31.14	31.36	31.61	31.64	31.60	31.77	32.51	33.82
2026	34.95	35.04	35.11	34.23	34.31	34.39	34.47	34.56	34.64	34.73	35.73	35.82
2027	38.10	38.20	38.29	36.92	36.92	37.01	37.11	37.21	37.30	37.70	37.50	38.62
2028	39.50	39.60	39.53	37.12	37.21	37.30	37.39	37.49	37.59	37.69	38.83	38.93
2029	39.83	39.93	39.78	37.20	37.29	37.38	37.47	37.57	37.66	37.76	38.93	39.04
2030	39.93	40.03	40.12	38.10	38.19	38.29	38.38	38.48	38.58	38.68	39.85	39.99
2031	40.86	40.97	40.54	38.24	38.33	38.43	38.52	38.62	38.71	38.81	40.03	40.13
2032	40.94	41.05	41.14	39.69	39.79	39.89	39.99	40.09	40.19	40.30	41.57	41.68
2033	42.80	42.92	43.02	41.92	42.02	42.13	42.24	42.35	42.47	42.58	43.93	44.04
2034	44.86	44.98	45.11	43.96	44.07	44.19	44.30	44.43	44.55	44.67	46.07	46.18
2035	46.19	46.33	46.50	44.47	44.59	44.70	44.80	44.93	45.06	45.27	46.57	46.69
2036	49.18	49.30	49.22	45.19	45.30	45.42	45.54	45.67	45.79	45.91	47.37	47.50
2037	50.83	50.95	49.31	46.55	46.67	46.80	46.93	47.04	47.15	47.30	48.97	49.14
2038	49.42	49.54	49.51	48.25	48.38	48.52	48.66	48.79	48.92	49.06	50.75	50.89
2039	53.34	53.49	52.06	49.84	49.96	50.13	50.26	50.42	50.55	50.69	52.52	52.66
2040	53.24	53.27	53.23	51.92	52.05	52.22	52.37	52.51	52.66	52.81	58.14	58.35
2041	56.70	56.87	57.16	55.74	55.90	56.06	56.22	56.39	56.57	56.74	60.28	60.46
2042	64.20	64.41	61.21	59.48	59.67	59.85	60.03	60.22	60.42	60.59	63.54	63.74
2043	74.00	74.16	61.56	60.03	60.21	60.48	60.59	60.85	61.03	61.20	63.82	64.13
2044	67.13	67.01	64.49	62.94	63.21	63.34	63.54	63.83	64.01	64.14	68.36	68.68
2045	72.55	72.68	65.34	64.11	64.31	64.54	64.76	64.85	65.15	65.35	70.36	70.62
2046	77.81	77.87	67.13	65.60	65.83	66.01	66.22	66.60	66.64	66.88	73.86	74.13

		1	1			TABLE 2b					1	
						oided Co						
				F	ixed Price	-		)F				
					Off-Peak	Forecast	(\$/WWH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	9.64	9.13	25.19	38.95	34.87	30.54	30.54	39.97
2022	38.03	33.95	27.84	16.63	8.81	11.61	26.27	35.44	34.03	27.92	29.38	34.62
2023	37.08	31.98	24.31	17.28	12.22	12.57	25.38	34.22	32.86	28.45	29.98	35.39
2024	37.39	32.26	24.54	17.47	12.38	12.73	25.62	34.52	33.15	28.71	30.25	35.69
2025	18.17	17.89	17.05	15.80	15.67	15.89	16.13	16.17	16.13	16.30	17.04	18.35
2026	19.16	19.26	19.33	18.44	18.52	18.60	18.68	18.77	18.85	18.94	19.95	20.03
2027	21.99	22.09	22.18	20.81	20.81	20.90	20.99	21.09	21.19	21.59	21.39	22.50
2028	23.06	23.16	23.08	20.67	20.76	20.86	20.95	21.05	21.15	21.24	22.39	22.49
2029	23.05	23.15	23.00	20.42	20.51	20.60	20.69	20.79	20.88	20.98	22.15	22.26
2030	22.81	22.91	23.00	20.98	21.07	21.16	21.26	21.36	21.46	21.55	22.73	22.87
2031	23.39	23.49	23.07	20.77	20.86	20.95	21.05	21.14	21.24	21.33	22.55	22.65
2032	23.22	23.33	23.43	21.97	22.07	22.17	22.27	22.37	22.48	22.58	23.85	23.96
2033	24.61	24.72	24.82	23.72	23.83	23.94	24.05	24.16	24.27	24.38	25.73	25.84
2034	26.24	26.35	26.48	25.33	25.44	25.56	25.68	25.80	25.92	26.04	27.44	27.56
2035	27.24	27.39	27.55	25.53	25.64	25.75	25.85	25.98	26.11	26.32	27.62	27.74
2036	29.91	30.03	29.95	25.91	26.03	26.15	26.27	26.39	26.51	26.64	28.09	28.22
2037	31.10	31.21	29.58	26.81	26.93	27.07	27.20	27.31	27.42	27.57	29.24	29.41
2038	29.28	29.40	29.37	28.11	28.24	28.39	28.52	28.66	28.78	28.93	30.61	30.75
2039	32.79	32.94	31.51	29.29	29.41	29.58	29.71	29.87	30.00	30.14	31.97	32.11
2040	32.27	32.30	32.25	30.95	31.08	31.25	31.40	31.54	31.69	31.84	37.17	37.38
2041	35.30	35.47	35.76	34.33	34.50	34.66	34.82	34.99	35.16	35.34	38.88	39.06
2042	42.36	42.57	39.37	37.64	37.83	38.01	38.19	38.38	38.58	38.75	41.70	41.90
2043	51.71	51.87	39.27	37.74	37.92	38.19	38.30	38.57	38.74	38.91	41.54	41.84
2044	44.46	44.34	41.82	40.27	40.53	40.67	40.87	41.15	41.34	41.47	45.69	46.01
2045	49.27	49.39	42.05	40.83	41.02	41.25	41.48	41.57	41.86	42.07	47.08	47.34
2046	54.12	54.18	43.45	41.92	42.14	42.33	42.53	42.91	42.95	43.19	50.18	50.45

						TABLE 3a						
						oided Co						
					ked Price			2F				
					On-Peak	Forecast	(\$/IVIVVH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	17.51	19.80	45.39	74.09	59.81	36.37	36.88	49.11
2022	45.11	40.01	29.82	21.16	16.73	19.63	44.60	59.38	51.23	32.70	34.16	42.48
2023	41.44	37.34	29.57	24.81	22.15	25.63	43.30	55.38	43.77	32.70	34.06	40.75
2024	41.51	37.41	29.65	24.89	22.22	25.70	43.37	55.46	43.85	32.78	34.13	40.83
2025	20.72	20.44	19.60	18.35	18.22	18.44	18.68	18.72	18.68	18.85	19.59	20.90
2026	21.77	21.86	21.93	21.04	21.12	21.21	21.29	21.37	21.46	21.54	22.55	22.64
2027	24.65	24.75	24.84	23.46	23.46	23.56	23.65	23.75	23.85	24.25	24.04	25.16
2028	25.77	25.87	25.79	23.38	23.47	23.57	23.66	23.76	23.86	23.95	25.10	25.20
2029	25.81	25.92	25.77	23.19	23.27	23.36	23.45	23.55	23.65	23.74	24.92	25.02
2030	25.63	25.73	25.82	23.80	23.89	23.99	24.08	24.18	24.28	24.38	25.55	25.69
2031	26.27	26.37	25.95	23.65	23.74	23.84	23.93	24.02	24.12	24.21	25.44	25.53
2032	26.14	26.24	26.34	24.89	24.98	25.09	25.18	25.29	25.39	25.49	26.77	26.87
2033	27.61	27.72	27.82	26.72	26.83	26.94	27.05	27.16	27.27	27.38	28.73	28.84
2034	29.31	29.43	29.55	28.40	28.52	28.64	28.75	28.87	29.00	29.12	30.51	30.63
2035	30.37	30.51	30.67	28.65	28.77	28.87	28.98	29.10	29.24	29.45	30.74	30.86
2036	33.08	33.20	33.12	29.08	29.20	29.32	29.44	29.56	29.69	29.81	31.27	31.39
2037	34.35	34.46	32.83	30.07	30.19	30.32	30.45	30.56	30.67	30.82	32.49	32.66
2038	32.60	32.72	32.69	31.43	31.56	31.70	31.84	31.98	32.10	32.25	33.93	34.07
2039	36.18	36.33	34.90	32.68	32.79	32.97	33.09	33.26	33.39	33.53	35.36	35.49
2040	35.73	35.76	35.71	34.41	34.53	34.70	34.86	34.99	35.15	35.30	40.62	40.83
2041	38.82	38.99	39.29	37.86	38.03	38.19	38.35	38.52	38.69	38.86	42.41	42.59
2042	45.97	46.17	42.97	41.24	41.43	41.61	41.79	41.98	42.18	42.36	45.30	45.51
2043	55.39	55.55	42.95	41.42	41.60	41.86	41.98	42.24	42.41	42.58	45.21	45.51
2044	48.19	48.07	45.56	44.00	44.27	44.40	44.60	44.89	45.07	45.20	49.42	49.75
2045	53.11	53.24	45.90	44.67	44.87	45.10	45.32	45.41	45.71	45.91	50.92	51.18
2046	58.03	58.09	47.35	45.82	46.05	46.23	46.44	46.82	46.86	47.10	54.08	54.3

						TABLE 3b						
						oided Co						
						Option for		QF				
L					Off-Peak	Forecast	(\$/MWH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	8.59	8.08	24.14	37.90	33.82	29.49	29.49	38.92
2022	36.96	32.88	26.76	15.56	7.74	10.53	25.20	34.37	32.95	26.85	28.31	33.55
2023	35.98	30.88	23.21	16.19	11.12	11.48	24.28	33.13	31.76	27.36	28.88	34.29
2024	36.27	31.14	23.42	16.35	11.26	11.62	24.50	33.40	32.03	27.60	29.13	34.57
2025	17.03	16.75	15.91	14.66	14.53	14.75	14.99	15.03	14.99	15.16	15.90	17.21
2026	18.00	18.09	18.16	17.28	17.36	17.44	17.52	17.61	17.69	17.78	18.78	18.87
2027	20.80	20.90	20.99	19.62	19.62	19.72	19.81	19.91	20.01	20.40	20.20	21.32
2028	21.84	21.95	21.87	19.46	19.55	19.65	19.74	19.84	19.93	20.03	21.18	21.28
2029	21.81	21.92	21.76	19.18	19.27	19.36	19.45	19.55	19.65	19.74	20.92	21.02
2030	21.54	21.65	21.74	19.72	19.81	19.90	20.00	20.10	20.20	20.29	21.47	21.61
2031	22.10	22.21	21.78	19.48	19.57	19.67	19.76	19.85	19.95	20.05	21.27	21.37
2032	21.91	22.01	22.11	20.66	20.76	20.86	20.96	21.06	21.16	21.26	22.54	22.64
2033	23.27	23.38	23.48	22.38	22.49	22.60	22.71	22.82	22.93	23.04	24.39	24.50
2034	24.87	24.98	25.11	23.96	24.07	24.19	24.31	24.43	24.55	24.67	26.07	26.19
2035	25.85	25.99	26.15	24.13	24.25	24.35	24.46	24.58	24.72	24.93	26.22	26.34
2036	28.48	28.60	28.52	24.48	24.60	24.72	24.84	24.97	25.09	25.21	26.67	26.79
2037	29.64	29.76	28.12	25.36	25.48	25.61	25.74	25.85	25.97	26.11	27.78	27.95
2038	27.79	27.92	27.88	26.63	26.75	26.90	27.04	27.17	27.30	27.44	29.12	29.27
2039	31.28	31.42	29.99	27.78	27.89	28.07	28.19	28.36	28.49	28.63	30.46	30.59
2040	30.72	30.76	30.71	29.40	29.53	29.70	29.86	29.99	30.15	30.29	35.62	35.83
2041	33.72	33.89	34.19	32.76	32.92	33.08	33.24	33.41	33.59	33.76	37.30	37.48
2042	40.76	40.96	37.76	36.03	36.22	36.40	36.58	36.77	36.97	37.15	40.09	40.30
2043	50.07	50.23	37.63	36.10	36.28	36.55	36.66	36.92	37.10	37.27	39.89	40.20
2044	42.78	42.66	40.15	38.60	38.86	38.99	39.19	39.48	39.66	39.80	44.01	44.34
2045	47.56	47.68	40.34	39.12	39.31	39.54	39.77	39.86	40.15	40.36	45.37	45.63
2046	52.38	52.44	41.70	40.17	40.40	40.58	40.79	41.17	41.21	41.45	48.43	48.70

#### 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 25.00%. The capacity contribution for Solar QF resources (Tables 6a and 6b) is assumed to be 5.50%. 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.

Prices paid to the Seller under the Renewable Fixed Price Option for Solar QFs (Tables 6a and 6b) include a reduction for the Solar integration costs in Table 7. However, if the Solar QF is outside of PGE's Balancing Authority Area as contemplated in the Commission's Order No. 14-058, the Seller is paid the solar integration charges in Table 7, in addition to the prices listed in Tables 6a and 6b.

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

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.

						TABLE 4	a					
						able Avoi						
				Renewal			on for Bas	e Load Q	F			
					On-Pea	k Forecas	t (\$/MWH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	18.89	21.19	46.77	75.47	61.20	37.75	38.26	50.49
2022	46.52	41.43	31.23	22.57	18.14	21.04	46.01	60.79	52.64	34.11	35.58	43.89
2023	42.88	38.78	31.01	26.25	23.59	27.07	44.74	56.82	45.21	34.14	35.50	42.19
2024	42.98	38.88	31.12	26.36	23.69	27.17	44.84	56.93	45.32	34.25	35.60	42.30
2025	79.90	74.79	65.11	59.17	55.85	60.19	82.22	97.29	82.81	69.01	70.70	79.05
2026	81.54	76.32	66.44	60.39	57.00	61.42	83.91	99.28	84.51	70.43	72.15	80.67
2027	83.21	77.88	67.80	61.62	58.17	62.68	85.63	101.32	86.24	71.87	73.63	82.32
2028	84.76	79.34	69.08	62.79	59.27	63.86	87.22	103.18	87.84	73.22	75.01	83.85
2029	86.65	81.11	70.61	64.17	60.57	65.27	89.17	105.51	89.81	74.85	76.68	85.73
2030	88.43	82.77	72.06	65.49	61.81	66.61	91.00	107.67	91.65	76.38	78.25	87.48
2031	90.24	84.46	73.53	66.83	63.08	67.97	92.86	109.88	93.53	77.94	79.85	89.28
2032	91.72	85.85	74.72	67.90	64.09	69.07	94.40	111.71	95.07	79.21	81.15	90.75
2033	93.97	87.96	76.58	69.60	65.69	70.79	96.70	114.42	97.40	81.17	83.16	92.97
2034	96.00	89.86	78.25	71.12	67.14	72.34	98.79	116.87	99.50	82.93	84.96	94.98
2035	97.86	91.60	79.75	72.48	68.41	73.72	100.71	119.16	101.43	84.53	86.60	96.82
2036	99.58	93.21	81.14	73.74	69.61	75.01	102.48	121.25	103.21	86.01	88.12	98.52
2037	101.91	95.39	83.05	75.48	71.24	76.77	104.88	124.09	105.63	88.03	90.18	100.83
2038	104.00	97.35	84.75	77.02	72.70	78.34	107.03	126.64	107.79	89.83	92.03	102.89
2039	106.13	99.34	86.48	78.60	74.19	79.95	109.22	129.23	110.00	91.67	93.92	105.00
2040	108.11	101.20	88.11	80.09	75.60	81.46	111.25	131.61	112.05	93.39	95.68	106.96
2041	110.52	103.45	90.06	81.85	77.26	83.26	113.74	134.58	114.55	95.47	97.80	109.35
2042	112.79	105.57	91.91	83.53	78.85	84.96	116.07	137.34	116.90	97.42	99.81	111.59
2043	115.10	107.74	93.79	85.24	80.46	86.70	118.45	140.15	119.30	99.42	101.85	113.87
2044	117.12	109.63	95.43	86.73	81.87	88.22	120.53	142.61	121.39	101.16	103.64	115.87
2045	119.99	112.32	97.80	88.90	83.92	90.42	123.48	146.08	124.36	103.66	106.19	118.71
2046	122.32	114.49	99.68	90.59	85.51	92.14	125.88	148.94	126.78	105.65	108.24	121.02

2021 2022	Jan 0.00	Feb		Renewat	ole Fixed I			o Load O	-											
2021 2022		Feb		Renewat		Renewable Fixed Price Option for Base Load QF														
2021 2022		Feb			Off-Peak Forecast (\$/MWH)															
2021 2022		Feb																		
2021 2022																				
2022	0.00																			
	00.07	0.00	0.00	0.00	9.97		25.52	39.28	35.20	30.87	30.87	40.30								
2023	38.37	34.29	28.17	16.97	9.15	11.95	26.61	35.78	34.37	28.26	29.72	34.96								
	37.42	32.32	24.65	17.63	12.56	12.92	25.72	34.57	33.21	28.80	30.32	35.73								
	37.74	32.61	24.89	17.82	12.73	13.09	25.97	34.87	33.50	29.07	30.60	36.04								
	47.06	40.66	31.04	22.22	15.87	16.32	32.38	43.47	41.77	36.24	38.15	44.94								
	48.02	41.49	31.67	22.68	16.20	16.65	33.05	44.36	42.62	36.98	38.93	45.86								
2027	49.00	42.34	32.32	23.14	16.53	16.99	33.72	45.27	43.50	37.74	39.73	46.80								
2028	49.87	43.09	32.89	23.55	16.82	17.29	34.32	46.07	44.27	38.41	40.44	47.63								
2029	51.03	44.10	33.66	24.10	17.21	17.69	35.12	47.15	45.30	39.30	41.38	48.73								
2030	52.08	45.00	34.35	24.59	17.57	18.06	35.84	48.11	46.22	40.11	42.22	49.73								
2031	53.14	45.92	35.05	25.10	17.93	18.43	36.57	49.10	47.17	40.93	43.09	50.75								
2032	54.09	46.73	35.67	25.54	18.24	18.75	37.22	49.97	48.01	41.65	43.85	51.65								
2033	55.34	47.82	36.50	26.14	18.67	19.19	38.09	51.13	49.12	42.62	44.87	52.85								
2034	56.48	48.80	37.25	26.67	19.05	19.58	38.87	52.18	50.13	43.50	45.79	53.94								
2035	57.64	49.80	38.02	27.22	19.44	19.98	39.66	53.25	51.16	44.39	46.73	55.04								
2036	58.66	50.68	38.69	27.70	19.79	20.34	40.36	54.19	52.06	45.17	47.56	56.01								
2037	60.02	51.86	39.59	28.34	20.25	20.81	41.30	55.45	53.27	46.22	48.67	57.32								
2038	61.25	52.93	40.40	28.93	20.66	21.24	42.15	56.59	54.37	47.17	49.66	58.49								
2039	62.51	54.01	41.23	29.52	21.08	21.67	43.01	57.75	55.48	48.14	50.68	59.69								
2040	63.61	54.97	41.96	30.04	21.46	22.06	43.77	58.77	56.46	48.99	51.58	60.75								
2041	65.09	56.25	42.93	30.74	21.96	22.57	44.79	60.14	57.78	50.13	52.78	62.16								
2042	66.43	57.40	43.81	31.37	22.41	23.03	45.71	61.37	58.96	51.16	53.86	63.44								
2043	67.79	58.57	44.71	32.01	22.87	23.50	46.65	62.63	60.17	52.20	54.96	64.74								
	68.99	59.61	45.50	32.58	23.27	23.92	47.47	63.73	61.23	53.13	55.93	65.88								
2045	70.59	61.00	46.56	33.34	23.81	24.48	48.58	65.22	62.66	54.37	57.24	67.41								
	72.04	62.25	47.52	34.02	24.30	24.98	49.57	66.55	63.94	55.48	58.41	68.80								

						TABLE 5a						
						ble Avoid						
				Renewa		d Price Op		Vind QF				
					On-Peak	Forecast	(\$/IVIVVH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	18.56	20.85	46.44	75.14	60.87	37.42	37.93	50.16
2022	46.18	41.09	30.89	22.23	17.81	20.70	45.67	60.46	52.30	33.77	35.24	43.55
2023	42.53	38.43	30.67	25.91	23.24	26.72	44.39	56.48	44.87	33.80	35.15	41.85
2024	42.63	38.53	30.76	26.00	23.34	26.82	44.49	56.57	44.96	33.90	35.25	41.94
2025	68.70	63.59	53.91	47.97	44.65	48.99	71.02	86.09	71.61	57.81	59.50	67.85
2026	70.10	64.89	55.01	48.95	45.57	49.99	72.48	87.85	73.08	59.00	60.72	69.24
2027	71.54	66.22	56.14	49.96	46.50	51.01	73.96	89.65	74.57	60.20	61.96	70.66
2028	72.85	67.43	57.18	50.88	47.37	51.96	75.31	91.28	75.94	61.31	63.10	71.95
2029	74.50	68.96	58.46	52.02	48.43	53.12	77.02	93.36	77.66	62.70	64.53	73.58
2030	76.03	70.37	59.66	53.09	49.42	54.21	78.60	95.27	79.25	63.98	65.85	75.09
2031	77.59	71.81	60.88	54.18	50.43	55.32	80.21	97.23	80.88	65.29	67.20	76.63
2032	78.89	73.02	61.89	55.07	51.26	56.24	81.56	98.88	82.24	66.38	68.32	77.92
2033	80.80	74.79	63.40	56.42	52.52	57.61	83.53	101.25	84.22	67.99	69.98	79.80
2034	82.51	76.38	64.76	57.64	53.65	58.85	85.30	103.38	86.01	69.45	71.47	81.49
2035	84.14	77.88	66.03	58.76	54.69	60.00	86.99	105.44	87.71	70.81	72.88	83.10
2036	85.62	79.25	67.18	59.79	55.65	61.05	88.52	107.30	89.25	72.05	74.16	84.56
2037	87.62	81.10	68.76	61.19	56.96	62.48	90.59	109.80	91.34	73.74	75.89	86.54
2038	89.42	82.77	70.17	62.44	58.12	63.76	92.44	112.05	93.21	75.25	77.45	88.31
2039	91.25	84.46	71.60	63.72	59.31	65.07	94.34	114.35	95.12	76.79	79.04	90.12
2040	92.92	86.01	72.93	64.90	60.42	66.28	96.06	116.43	96.86	78.21	80.49	91.77
2041	95.03	87.96	74.57	66.36	61.77	67.76	98.24	119.08	99.06	79.97	82.31	93.85
2042	96.98	89.76	76.10	67.72	63.03	69.15	100.26	121.52	101.09	81.61	83.99	95.78
2043	98.96	91.60	77.66	69.11	64.32	70.57	102.31	124.01	103.16	83.28	85.71	97.74
2044	100.70	93.21	79.02	70.32	65.45	71.80	104.11	126.20	104.97	84.74	87.22	99.46
2045	103.13	95.46	80.94	72.04	67.06	73.56	106.62	129.22	107.50	86.80	89.34	101.86
2046	105.17	97.34	82.53	73.44	68.36	74.99	108.73	131.79	109.63	88.51	91.09	103.87

, ,						TABLE 5b						
					Renewa	ble Avoid	ed Costs					
				Renewa	able Fixed	d Price Op	otion for V	Vind QF				
					Off-Peak	Forecast	(\$/MWH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	9.64	9.13	25.19	38.95	34.87	30.54	30.54	39.97
2022	38.03	33.95	27.84	16.63	8.81	11.61	26.27	35.44	34.03	27.92	29.38	34.62
2023	37.08	31.98	24.31	17.28	12.22	12.57	25.38	34.22	32.86	28.45	29.98	35.39
2024	37.39	32.26	24.54	17.47	12.38	12.73	25.62	34.52	33.15	28.71	30.25	35.69
2025	46.70	40.30	30.68	21.86	15.51	15.96	32.02	43.11	41.41	35.88	37.79	44.58
2026	47.65	41.13	31.31	22.31	15.83	16.28	32.68	44.00	42.25	36.61	38.57	45.49
2027	48.63	41.97	31.95	22.77	16.15	16.62	33.35	44.90	43.12	37.36	39.36	46.42
2028	49.49	42.71	32.51	23.17	16.44	16.91	33.94	45.69	43.88	38.02	40.05	47.24
2029	50.64	43.71	33.27	23.71	16.82	17.30	34.73	46.76	44.91	38.91	40.99	48.34
2030	51.68	44.60	33.95	24.20	17.17	17.66	35.44	47.71	45.83	39.71	41.83	49.33
2031	52.74	45.52	34.65	24.69	17.52	18.02	36.17	48.69	46.76	40.52	42.68	50.35
2032	53.67	46.32	35.26	25.13	17.83	18.34	36.80	49.55	47.59	41.24	43.44	51.24
2033	54.92	47.40	36.08	25.71	18.24	18.77	37.66	50.71	48.70	42.20	44.45	52.43
2034	56.05	48.37	36.82	26.24	18.62	19.15	38.43	51.75	49.70	43.06	45.36	53.50
2035	57.19	49.36	37.57	26.78	19.00	19.54	39.22	52.81	50.72	43.95	46.29	54.60
2036	58.21	50.23	38.24	27.25	19.34	19.89	39.91	53.74	51.61	44.72	47.11	55.56
2037	59.56	51.40	39.13	27.89	19.79	20.35	40.84	54.99	52.81	45.76	48.21	56.86
2038	60.78	52.46	39.93	28.46	20.19	20.77	41.68	56.12	53.90	46.70	49.19	58.02
2039	62.03	53.53	40.75	29.04	20.61	21.19	42.54	57.27	55.00	47.66	50.20	59.21
2040	63.12	54.48	41.47	29.55	20.97	21.57	43.29	58.28	55.97	48.50	51.09	60.26
2041	64.59	55.75	42.44	30.24	21.46	22.07	44.30	59.64	57.28	49.63	52.28	61.66
2042	65.92	56.89	43.31	30.86	21.90	22.52	45.20	60.86	58.45	50.65	53.35	62.93
2043	67.27	58.06	44.19	31.49	22.35	22.99	46.13	62.11	59.65	51.69	54.44	64.22
2044	68.46	59.08	44.97	32.05	22.74	23.39	46.94	63.21	60.70	52.60	55.41	65.35
2045	70.05	60.46	46.02	32.80	23.27	23.94	48.04	64.68	62.12	53.83	56.70	66.87
2046	71.49	61.70	46.96	33.47	23.75	24.43	49.02	66.00	63.39	54.93	57.86	68.24

						TABLE 6a						
						ble Avoid						
						Price Op		Solar QF				
					On-Peak	Forecast	(\$/MVVH)					
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	17.51	19.80	45.39	74.09	59.81	36.37	36.88	49.11
2022	45.11	40.01	29.82	21.16	16.73	19.63	44.60	59.38	51.23	32.70	34.16	42.48
2023	41.44	37.34	29.57	24.81	22.15	25.63	43.30	55.38	43.77	32.70	34.06	40.75
2024	41.51	37.41	29.65	24.89	22.22	25.70	43.37	55.46	43.85	32.78	34.13	40.83
2025	55.78	50.67	40.99	35.05	31.73	36.06	58.10	73.17	58.69	44.89	46.58	54.93
2026	56.92	51.70	41.83	35.77	32.38	36.80	59.29	74.66	59.89	45.81	47.53	56.05
2027	58.09	52.76	42.68	36.50	33.05	37.56	60.51	76.19	61.12	46.75	48.51	57.20
2028	59.12	53.70	43.44	37.15	33.64	38.23	61.58	77.55	62.21	47.58	49.37	58.22
2029	60.49	54.95	44.45	38.01	34.41	39.11	63.01	79.35	63.65	48.68	50.52	59.57
2030	61.73	56.07	45.36	38.79	35.12	39.91	64.30	80.97	64.95	49.68	51.55	60.79
2031	62.99	57.22	46.29	39.59	35.84	40.73	65.62	82.63	66.28	50.70	52.61	62.03
2032	64.09	58.21	47.09	40.27	36.45	41.43	66.76	84.07	67.44	51.58	53.52	63.11
2033	65.60	59.59	48.20	41.22	37.32	42.42	68.33	86.05	69.03	52.80	54.78	64.60
2034	66.96	60.82	49.21	42.08	38.10	43.30	69.75	87.83	70.46	53.89	55.92	65.94
2035	68.32	62.06	50.20	42.93	38.87	44.17	71.16	89.61	71.88	54.98	57.05	67.28
2036	69.52	63.15	51.08	43.68	39.55	44.95	72.41	91.19	73.15	55.95	58.06	68.46
2037	71.14	64.62	52.28	44.71	40.47	46.00	74.11	93.32	74.86	57.26	59.41	70.06
2038	72.60	65.95	53.35	45.62	41.30	46.94	75.63	95.24	76.39	58.43	60.63	71.50
2039	74.09	67.30	54.44	46.56	42.15	47.91	77.18	97.19	77.96	59.63	61.87	72.96
2040	75.41	68.50	55.41	47.39	42.90	48.76	78.55	98.92	79.35	60.69	62.98	74.26
2041	77.16	70.09	56.70	48.49	43.89	49.89	80.37	101.21	81.19	62.10	64.43	75.98
2042	78.74	71.52	57.86	49.48	44.79	50.91	82.02	103.28	82.85	63.37	65.75	77.54
2043	80.35	72.99	59.04	50.49	45.71	51.95	83.70	105.40	84.55	64.67	67.10	79.12
2044	81.76	74.27	60.08	51.38	46.51	52.86	85.17	107.26	86.03	65.80	68.28	80.52
2045	83.69	76.02	61.50	52.60	47.62	54.12	87.18	109.78	88.06	67.36	69.90	82.42
2046	85.39	77.56	62.75	53.66	48.58	55.21	88.95	112.01	89.85	68.72	71.31	84.09

					٦	FABLE 6b						
					Renewal							
				Renewa	ble Fixed	Price Op	tion for S	Solar QF				
					Off-Peak	Forecast	(\$/MWH)					
Year	Jan	Feb	Mar	Арг	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	0.00	0.00	0.00	0.00	8.59	8.08	24.14	37.90	33.82	29.49	29.49	38.92
2022	36.96	32.88	26.76	15.56	7.74	10.53	25.20	34.37	32.95	26.85	28.31	33.55
2023	35.98	30.88	23.21	16.19	11.12	11.48	24.28	33.13	31.76	27.36	28.88	34.29
2024	36.27	31.14	23.42	16.35	11.26	11.62	24.50	33.40	32.03	27.60	29.13	34.57
2025	45.56	39.16	29.54	20.72	14.37	14.82	30.88	41.97	40.27	34.74	36.65	43.44
2026	46.49	39.96	30.14	21.15	14.67	15.12	31.51	42.83	41.09	35.45	37.40	44.33
2027	47.44	40.78	30.76	21.58	14.97	15.43	32.16	43.71	41.93	36.18	38.17	45.24
2028	48.28	41.50	31.30	21.96	15.23	15.70	32.73	44.48	42.67	36.81	38.84	46.03
2029	49.41	42.47	32.03	22.47	15.59	16.07	33.49	45.52	43.67	37.67	39.75	47.11
2030	50.42	43.34	32.69	22.93	15.91	16.40	34.18	46.45	44.56	38.45	40.56	48.07
2031	51.45	44.23	33.36	23.40	16.23	16.73	34.88	47.40	45.48	39.23	41.40	49.06
2032	52.36	45.01	33.94	23.81	16.51	17.02	35.49	48.24	46.28	39.92	42.12	49.92
2033	53.58	46.06	34.74	24.37	16.90	17.43	36.32	49.37	47.36	40.86	43.11	51.09
2034	54.68	47.00	35.45	24.87	17.25	17.78	37.07	50.38	48.33	41.70	43.99	52.14
2035	55.80	47.97	36.18	25.38	17.60	18.15	37.82	51.41	49.32	42.55	44.89	53.20
2036	56.78	48.81	36.81	25.83	17.91	18.46	38.49	52.31	50.19	43.30	45.68	54.14
2037	58.11	49.95	37.68	26.43	18.33	18.90	39.39	53.54	51.36	44.31	46.75	55.41
2038	59.30	50.97	38.45	26.97	18.71	19.29	40.20	54.63	52.41	45.22	47.71	56.54
2039	60.51	52.02	39.24	27.53	19.09	19.68	41.02	55.75	53.49	46.14	48.69	57.70
2040	61.58	52.93	39.92	28.01	19.42	20.02	41.74	56.74	54.43	46.96	49.54	58.71
2041	63.02	54.17	40.86	28.66	19.88	20.50	42.72	58.06	55.70	48.05	50.70	60.09
2042	64.31	55.28	41.70	29.25	20.29	20.92	43.59	59.25	56.84	49.04	51.74	61.32
2043	65.63	56.41	42.55	29.85	20.70	21.34	44.49	60.47	58.01	50.04	52.80	62.57
2044	66.78	57.41	43.30	30.37	21.06	21.72	45.27	61.53	59.03	50.92	53.73	63.68
2045	68.34	58.75	44.31	31.09	21.56	22.23	46.33	62.97	60.41	52.12	54.99	65.16
2046	69.74	59.95	45.22	31.72	22.00	22.68	47.28	64.26	61.65	53.18	56.11	66.50

# WIND INTEGRATION

TABLE 7		
Integration Costs		
Year	Wind	Solar
2021	0.33	1.38
2022	0.34	1.41
2023	0.35	1.44
2024	0.35	1.47
2025	0.36	1.50
2026	0.37	1.53
2027	0.37	1.56
2028	0.38	1.59
2029	0.39	1.63
2030	0.40	1.66
2031	0.41	1.69
2032	0.41	1.73
2033	0.42	1.76
2034	0.43	1.80
2035	0.44	1.84
2036	0.45	1.87
2037	0.46	1.91
2038	0.47	1.95
2039	0.48	1.99
2040	0.49	2.03
2041	0.50	2.07
2042	0.51	2.12
2043	0.52	2.16
2044	0.53	2.21
2045	0.54	2.25
2046	0.55	2.30

# 3. As-Available Rate

The As-Available Rate is based on the Avoided Energy Cost for surplus energy at the time of delivery. The As-Available Rate is equal to the Avoided Energy Cost. The Company will purchase As-Available Energy at the As-Available Rate.

#### 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.

#### 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 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 or active in a county in which the project is located or active in a county adjoining 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

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 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.

## OTHER DEFINITIONS As-Available Energy

As-Available Energy means 1) all Net Output delivered to PGE if Seller elected the As-Available Rate option within a Standard PPA, or 2) (a) all Net Output delivered prior to the Commercial Operation Date; (b) all Net Output deliveries greater than Maximum Net Output in any Contract Year as defined under the Standard PPA year; ; and (c) for deliveries above the nameplate capacity in any hour.

Deliveries pursuant to an Off-System PPA that are above the nameplate capacity in any hour solely for the purpose of accommodating hourly scheduling in whole megawatts by a third-party transmission provider will not be subject to the As-Available Rate.

## Mid-C Index Price

As used in this schedule, the daily Mid-C Index Price shall be the applicable day-ahead Intercontinental Exchange ("ICE") Mid-C Physical Peak (bilateral) or Mid-C Physical Off-Peak (bilateral) indices representative of the OTC market for WSPP Schedule-C physical Firm Energy transactions at the Mid-C trading hub. <u>Product details for the Mid-C</u> Physical Peak (bilateral) or Mid-C Physical Off-Peak (bilateral) are found on the following website: <u>https://www.theice.com/products/OTC/Physical-Energy/Electricity</u>. 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.

## Avoided Energy Cost:

The Avoided Energy Cost means eighty-two and four tenths percent (82.4%) of the monthly arithmetic average of each day's ICE Mid-C Physical Peak (bilateral) and Mid-C Physical Off-Peak (bilateral) average index prices. Each day's index prices will reflect the relative proportions of peak hours and off-peak hours in the month as follows:

.824 \* (  $\sum_{x=1}^{"}$  {(ICE Mid-C Physical Peak (bilateral) Avg<sub>x</sub> \* applicable peak index hours for day) +

(ICE Mid-C Physical Off-Peak (bilateral) Avgx \* applicable off-peak index hours for day)} / (n\*24))

where n = number of days in the month

## OTHER DEFINITIONS (Continued)

## **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 (C02), 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 2024.

## **Definition of Resource Deficiency Period**

This is the period from 2025.

## 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.

#### **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.

# SCHEDULE 201 (Concluded)

**DISPUTE RESOLUTION (Continued)** 

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.

# PGE UM 1728

# Application to Update Schedule 201 Avoided Cost Power Purchase Information

Attachment A Description of Standard Avoided Costs

# PORTLAND GENERAL ELECTRIC COMPANY STANDARD AVOIDED COST STUDY 2021 ANNUAL UPDATE

# Introduction

Consistent with Commission Order No. 14-058,<sup>1</sup> annual avoided cost updates allow modification of four factors:

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

This 2021 Standard Avoided Cost update will focus on the first two factors, and updates included in PGE's acknowledged 2019 IRP Update.

Below is a summary of the changes:

#### Factor 1: Gas Price Projections

Natural gas prices are based on PGE's forward AECO price curves from February 26, 2021 for May 2021 through December 2025. For 2026-2050, prices are based on the same methodology as the acknowledged 2019 IRP Update with the most recent long-term forecast from Wood Mackenzie (2020 H2). The 2026 prices are based on a linear interpolation from PGE's curves to the long-term forecast. For 2027 through 2050, prices align with the AECO prices from the 2020 H2 Wood Mackenzie forecast. Prices after 2050 are escalated with inflation.

The nominal average annual northwest burnertip natural gas price is forecasted to trend from \$2.04/MMBtu in 2022 to \$5.78/MMBtu in 2045.

The variable gas transportation costs are based on 2021 AUT variable transportation costs and loss rates.

The nominal average variable gas transportation cost is forecasted to trend from \$0.07/MMBtu in 2022 to \$0.18/MMBtu in 2045.

## Factor 2: Electricity Market Projections

The forward trading curves are based on market prices for electricity delivered to PGE's system and calculated according to the methodology approved by the OPUC. The forward trading curves adjusted for delivery are used to price avoided costs during a

<sup>1</sup> In the Matter of Investigation Into Qualifying Facility Contracting and Pricing, Docket No, UM 1610, Order No. 14-058 at 25-26 (Feb. 24, 2014).

# PORTLAND GENERAL ELECTRIC COMPANY STANDARD AVOIDED COST STUDY 2021 ANNUAL UPDATE

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PGE's 2021 Standard AVOIDED COST ANNUAL UPDATE WORKPAPERS – Page 2

resource sufficiency period. For May 2021 through December 2025, the market prices are based on PGE's forward Mid-Columbia trading curve from February 26, 2021.

As in the current Schedule 201 prices, wheeling costs remain based on current BPA rates adjusted for inflation.

# Factor 4: Other Action

PGE's 2019 IRP Update (LC 73) was acknowledged at the April 20, 2021 OPUC Special Public Meeting. Therefore, PGE also updated ELCC values, the SCCT net energy value, interconnection costs, and CCCT annual generation and starts.

Consistent with Commission requirements, PGE uses a natural gas combined-cycle combustion turbine  $(CCCT)^2$  as a proxy resource for standard avoided cost prices with capacity valued based on an SCCT.

- The updated ELCC values (incremental solar, wind, and SCCT resources) were discussed in Section 5.3 of the IRP Update and provided in tabular format in Appendix D of the IRP Update. The avoided cost calculation for the levelized cost of capacity was updated to account for the SCCT ELCC value, which aligns with the IRP Update Sections 5.3 and 5.4.
- The updated SCCT net energy value was provided in Appendix F of the IRP Update.
- The updated inflation and interest rates for the interconnection costs were discussed in Section 5.1 of the IRP Update and provided in Appendix F.
- The CCCT generation and starts are based on the dispatch from the IRP Update modeling. The values were provided in Table 3 of PGE's February 5 Supplemental Filing in LC 73.

# **Deficiency/Sufficiency Periods**

There is no change to the Deficiency/Sufficiency periods as a result of this May 1 Update. The current Deficiency/Sufficiency periods approved by the Commission in Order No. 20-171 are stated below for reference purposes:

- Resource Sufficiency Period is the period from the current year through 2024.
- Resource Deficiency Period is the period from 2025.

Avoided Cost Pricing Estimates

<sup>2</sup> Representing the energy portion of costs.

PGE's 2021 Standard AVOIDED COST ANNUAL UPDATE WORKPAPERS – Page 3

Tables 1 through 3 (following) summarize the results for PGE's fixed price option. Tables 1a, 1b, 2a, 2b, 3a, and  $3b^3$  are estimates of monthly on- and off-peak avoided costs for energy and capacity over 20 years beginning in May 2021. The pricing is comprised of the energy plus the capacity costs (discussed below).<sup>4</sup>

The sufficiency period prices (expressed in \$/MWh or mills/kWh) for the years 2021 through 2024, are based on the forward electricity prices adjusted for delivery as discussed above.

The deficiency period prices begin in 2025. The on-peak prices represent both capacity and energy costs, while off-peak prices represent energy costs only. The on-peak price includes the following costs of a CCCT: fuel, variable operation and maintenance (O&M), capacity, and other fixed costs. The off-peak price includes fuel, variable O&M, and other fixed costs. The "other fixed costs" represent the energy portion of the fixed costs of a CCCT. Other fixed costs are calculated by taking the fixed costs of a CCCT minus the real levelized capital carrying cost and fixed O&M of an SCCT. The result (other fixed costs) represents the energy portion of the fixed costs of a CCCT. On-peak periods are from 6 a.m. through 10 p.m. Mondays through Saturdays. The off-peak hours are from 10 p.m. until 6 a.m. Mondays through Saturdays and all twenty-four hours on Sunday.<sup>5</sup> Table 4 provides integration costs avoided. Tables 4 and 5 show the projected on- and off-peak resource sufficiency period forward market prices.

# Avoided Cost Components

# Energy:

Tables 6 through 13 in the work papers show the other fixed costs, variable O&M, fuel costs, gas forecast avoided cost components (with and without transportation), and capacity.

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

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

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

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

<sup>&</sup>lt;sup>4</sup> Table 1: Base Load QF; Table 2: Wind QF; Table 3: Solar QF.

 <sup>&</sup>lt;sup>4</sup> Avoided Cost Components section.
 <sup>5</sup> Schedule 201, Sheet 201-3.

### Capacity:

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

# **Standard Energy Tables**

						General El							
						ed Cost Stu nergy, Bas							
able S.1a					оп-геак Е	nergy, bas	eLodu			N	Iominal \$/N	1Wh	
able 3.1d										I	φ/Iv		
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	0.00	0.00	0.00	0.00	18.89	21.19	46.77	75.47	61.20	37.75	38.26	50.49	, united
2022	46.52	41.43	31.23	22.57	18.14	21.04	46.01	60.79	52.64	34.11	35.58	43.89	37.8
2023	42.88	38.78	31.01	26.25	23.59	27.07	44.74	56.82	45.21	34.14	35.50	42.19	37.3
2024	42.98	38.88	31.12	26.36	23.69	27.17	44.84	56.93	45.32	34.25	35.60	42.30	37.5
2025	18.53	18.25	17.41	16.16	16.03	16.25	16.49	16.53	16.49	16.66	17.40	18.71	17.0
2026	19.53	19.62	19.69	18.81	18.89	18.97	19.05	19.14	19.22	19.31	20.31	20.40	19.4
2027	22.36	22.47	22.56	21.18	21.18	21.28	21.37	21.47	21.57	21.97	21.76	22.88	21.8
2028	23.44	23.54	23.47	21.06	21.15	21.20	21.37	21.43	21.57	21.63	22.78	22.87	22.1
2029	23.44	23.54	23.39	20.81	20.90	20.99	21.08	21.18	21.27	21.37	22.54	22.65	21.9
2025	23.20	23.34	23.40	21.38	21.47	21.56	21.66	21.76	21.86	21.95	23.13	23.27	22.3
2030	23.79	23.90	23.48	21.30	21.47	21.36	21.00	21.55	21.65	21.74	22.96	23.06	22.2
2031	23.64	23.74	23.84	22.39	22.49	21.50	21.45	21.55	22.89	22.99	24.27	23.00	23.2
2032	25.04	25.14	25.24	22.33	24.25	24.36	22.05	24.58	22.03	24.80	26.15	24.37	24.9
				24.14						24.60			
2034 2035	26.67	26.78	26.91		25.87	25.99	26.11	26.23	26.35		27.87	27.99	26.5
	27.68	27.83	27.99	25.97	26.08	26.19	26.30	26.42	26.55	26.76	28.06	28.18	27.0
2036	30.36	30.48	30.40	26.36	26.48	26.60	26.72	26.84	26.96	27.09	28.54	28.67	27.9
2037	31.56	31.67	30.03	27.27	27.39	27.53	27.66	27.77	27.88	28.03	29.70	29.87	28.8
2038	29.75	29.87	29.84	28.58	28.71	28.85	28.99	29.12	29.25	29.39	31.08	31.22	29.5
2039	33.27	33.42	31.99	29.77	29.88	30.06	30.18	30.35	30.48	30.62	32.45	32.58	31.2
2040	32.76	32.79	32.74	31.44	31.57	31.73	31.89	32.02	32.18	32.33	37.65	37.86	33.0
2041	35.79	35.96	36.26	34.83	35.00	35.16	35.32	35.49	35.66	35.83	39.38	39.56	36.1
2042	42.87	43.08	39.88	38.15	38.34	38.52	38.70	38.89	39.08	39.26	42.21	42.41	40.1
2043	52.23	52.39	39.79	38.26	38.44	38.71	38.82	39.09	39.26	39.43	42.06	42.36	41.6
2044	44.99	44.87	42.35	40.80	41.06	41.20	41.39	41.68	41.87	42.00	46.22	46.54	42.9
2045	49.81	49.93	42.59	41.37	41.56	41.79	42.02	42.11	42.40	42.61	47.62	47.88	44.2
2046	54.67	54.73	44.00	42.47	42.69	42.88	43.08	43.47	43.51	43.74	50.73	51.00	46.3
					Portland	General El	ectric						
						ed Cost Stu							
					Off-Peak E	nergy, Bas	e Load						
Table S.1b										1	lominal \$/N	IVVh	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	0.00	0.00	0.00	0.00	9.97	9.46	25.52	39.28	35.20	30.87	30.87	40.30	
2022	38.37	34.29	28.17	16.97	9.15	11.95	26.61	35.78	34.37	28.26	29.72	34.96	27.3
2023	37.42	32.32	24.65	17.63	12.56	12.92	25.72	34.57	33.21	28.80	30.32	35.73	27.1
2024	37.74	32.61	24.89	17.82	12.73	13.09	25.97	34.87	33.50	29.07	30.60	36.04	27.4
2025	18.53	18.25	17.41	16.16	16.03	16.25	16.49	16.53	16.49	16.66	17.40	18.71	17.0
2026	19.53	19.62	19.69	18.81	18.89	18.97	19.05	19.14	19.22	19.31	20.31	20.40	19.4
2027	22.36	22.47	22.56	21.18	21.18	21.28	21.37	21.47	21.57	21.97	21.76	22.88	21.8
2028	23.44	23.54	23.47	21.06	21.15	21.24	21.33	21.43	21.53	21.63	22.78	22.87	22.1
2029	23.44	23.54	23.39	20.81	20.90	20.99	21.08	21.18	21.27	21.37	22.54	22.65	21.9
2030	23.20	23.31	23.40	21.38	21.47	21.56	21.66	21.76	21.86	21.95	23.13	23.27	22.3
2030	23.79	23.90	23.48	21.18	21.27	21.36	21.45	21.55	21.65	21.74	22.96	23.06	22.2
2031	23.64	23.74	23.40	22.39	22.49	22.59	22.69	22.79	22.89	22.99	24.27	24.37	23.2
2032	25.04	25.14	25.24	24.14	24.25	24.36	24.47	24.58	24.69	24.80	26.15	26.27	24.9
2033	26.67	26.78	26.91	25.76	24.25	25.99	24.47	26.23	26.35	26.47	27.87	20.27	24.5
2034	20.07	20.70	20.91	25.76	25.07	25.99	26.11	26.23	26.55	26.47	28.06	28.18	26.9
2035	30.36	30.48	30.40	26.36	26.08	26.19	26.30	26.42	26.95	20.76	28.54	28.67	20.9
2036	30.36	30.48	30.40		26.48		26.72		26.96		28.54	28.67	
2037				27.27		27.53		27.77		28.03			28.8
	29.75	29.87	29.84	28.58	28.71	28.85	28.99	29.12	29.25	29.39	31.08	31.22	29.5
2039	33.27	33.42	31.99	29.77	29.88	30.06	30.18	30.35	30.48	30.62	32.45	32.58	31.2
2040	32.76	32.79	32.74	31.44	31.57	31.73	31.89	32.02	32.18	32.33	37.65	37.86	33.0
2041	35.79	35.96	36.26	34.83	35.00	35.16	35.32	35.49	35.66	35.83	39.38	39.56	36.2
2042	42.87	43.08	39.88	38.15	38.34	38.52	38.70	38.89	39.08	39.26	42.21	42.41	40.1
2043	52.23	52.39	39.79	38.26	38.44	38.71	38.82	39.09	39.26	39.43	42.06	42.36	41.6
2044	44.99	44.87	42.35	40.80	41.06	41.20	41.39	41.68	41.87	42.00	46.22	46.54	42.9
		40.02	40.00	44.07	44 50	44 70	40.00	40 44	40.40	40.04	47.00	47.00	44.2
2045 2046	49.81 54.67	49.93 54.73	42.59 44.00	41.37 42.47	41.56 42.69	41.79 42.88	42.02 43.08	42.11 43.47	42.40 43.51	42.61 43.74	47.62 50.73	47.88 51.00	44.2

						General El ed Cost Stu							
						k Energy, V							
able S.2a											Nominal \$/N	/Wh	
Vee	Jan	Feb	Mar	A	Maria	l	Jul	A	Sep	0-1	Nov	Dec	Annua
Year 2021	0.00	0.00	0.00	Apr 0.00	May 18.56	Jun 20.85	46.44	Aug 75.14	60.87	Oct 37.42		50.16	Annua
2022	46.18	41.09	30.89	22.23	17.81	20.00	45.67	60.46	52.30	33.77	35.24	43.55	37.
2022		38.43		25.91	23.24	26.72	45.67	56.48	44.87	33.80		43.55	37.
	42.53		30.67								35.15		
2024	42.63	38.53	30.76	26.00	23.34	26.82	44.49	56.57	44.96	33.90	35.25	41.94	37.
2025	18.17	17.89	17.05	15.80	15.67	15.89	16.13	16.17	16.13	16.30	17.04	18.35	16.
2026	19.16	19.26	19.33	18.44	18.52	18.60	18.68	18.77	18.85	18.94	19.95	20.03	19
2027	21.99	22.09	22.18	20.81	20.81	20.90	20.99	21.09	21.19	21.59	21.39	22.50	21
2028	23.06	23.16	23.08	20.67	20.76	20.86	20.95	21.05	21.15	21.24	22.39	22.49	21
2029	23.05	23.15	23.00	20.42	20.51	20.60	20.69	20.79	20.88	20.98		22.26	21.
2030	22.81	22.91	23.00	20.98	21.07	21.16	21.26	21.36	21.46	21.55	22.73	22.87	21.
2031	23.39	23.49	23.07	20.77	20.86	20.95	21.05	21.14	21.24	21.33		22.65	21.
2032	23.22	23.33	23.43	21.97	22.07	22.17	22.27	22.37	22.48	22.58	23.85	23.96	22.
2033	24.61	24.72	24.82	23.72	23.83	23.94	24.05	24.16	24.27	24.38	25.73	25.84	24.
2034	26.24	26.35	26.48	25.33	25.44	25.56	25.68	25.80	25.92	26.04	27.44	27.56	26
2035	27.24	27.39	27.55	25.53	25.64	25.75	25.85	25.98	26.11	26.32	27.62	27.74	26
2036	29.91	30.03	29.95	25.91	26.03	26.15	26.27	26.39	26.51	26.64	28.09	28.22	27
2037	31.10	31.21	29.58	26.81	26.93	27.07	27.20	27.31	27.42	27.57	29.24	29.41	28.
2038	29.28	29.40	29.37	28.11	28.24	28.39	28.52	28.66	28.78	28.93	30.61	30.75	29
2039	32.79	32.94	31.51	29.29	29.41	29.58	29.71	29.87	30.00	30.14	31.97	32.11	30
2040	32.27	32.30	32.25	30.95	31.08	31.25	31.40	31.54	31.69	31.84	37.17	37.38	32
2041	35.30	35.47	35.76	34.33	34.50	34.66	34.82	34.99	35.16	35.34	38.88	39.06	35
2042	42.36	42.57	39.37	37.64	37.83	38.01	38.19	38.38	38.58	38.75	41.70	41.90	39
2042	51.71	51.87	39.27	37.74	37.92	38.19	38.30	38.57	38.74	38.91	41.54	41.84	41
2045	44.46	44.34	41.82	40.27	40.53	40.67	40.87	41.15	41.34	41.47	45.69	46.01	42
2044	49.27	49.39	41.02	40.27	40.55	40.07	40.07	41.15	41.86	41.47	45.05	47.34	43
2045	54.12	54.18	42.05	40.03	41.02	41.23	41.40	41.57	41.00	42.07		50.45	45
2040	J4. 1Z	34.10	43.45	41.32				42.51	42.55	43.13	50.10	00.40	40.
						General El							
						ed Cost Stu							
able S.2b					UII-Fea	k Energy, V	VIIIu				Nominal \$/M	IWh	
V	lan.	<b>F</b> - <b>b</b>	14	A	Maria	hur	l. l	A	0	0-1	New	Dee	A
Year	Jan	Feb	Mar	Apr	May	Jun	Jul 25.10	Aug	Sep	Oct	Nov	Dec	Annua
2021	0.00	0.00	0.00	0.00	9.64	9.13	25.19	38.95	34.87	30.54	30.54	39.97	
2021 2022	0.00 38.03	0.00 33.95	0.00 27.84	0.00	9.64 8.81	9.13 11.61	25.19 26.27	38.95 35.44	34.87 34.03	30.54 27.92	30.54 29.38	39.97 34.62	27.
2021 2022 2023	0.00 38.03 37.08	0.00 33.95 31.98	0.00 27.84 24.31	0.00 16.63 17.28	9.64 8.81 12.22	9.13 11.61 12.57	25.19 26.27 25.38	38.95 35.44 34.22	34.87 34.03 32.86	30.54 27.92 28.45	30.54 29.38 29.98	39.97 34.62 35.39	27. 26.
2021 2022 2023 2024	0.00 38.03 37.08 37.39	0.00 33.95 31.98 32.26	0.00 27.84 24.31 24.54	0.00 16.63 17.28 17.47	9.64 8.81 12.22 12.38	9.13 11.61 12.57 12.73	25.19 26.27 25.38 25.62	38.95 35.44 34.22 34.52	34.87 34.03 32.86 33.15	30.54 27.92 28.45 28.71	30.54 29.38 29.98 30.25	39.97 34.62 35.39 35.69	27. 26. 27.
2021 2022 2023 2024 2025	0.00 38.03 37.08 37.39 18.17	0.00 33.95 31.98 32.26 17.89	0.00 27.84 24.31 24.54 17.05	0.00 16.63 17.28 17.47 15.80	9.64 8.81 12.22 12.38 15.67	9.13 11.61 12.57 12.73 15.89	25.19 26.27 25.38 25.62 16.13	38.95 35.44 34.22 34.52 16.17	34.87 34.03 32.86 33.15 16.13	30.54 27.92 28.45 28.71 16.30	30.54 29.38 29.98 30.25 17.04	39.97 34.62 35.39 35.69 18.35	27. 26. 27. 16.
2021 2022 2023 2024 2025 2026	0.00 38.03 37.08 37.39 18.17 19.16	0.00 33.95 31.98 32.26 17.89 19.26	0.00 27.84 24.31 24.54 17.05 19.33	0.00 16.63 17.28 17.47 15.80 18.44	9.64 8.81 12.22 12.38 15.67 18.52	9.13 11.61 12.57 12.73 15.89 18.60	25.19 26.27 25.38 25.62 16.13 18.68	38.95 35.44 34.22 34.52 16.17 18.77	34.87 34.03 32.86 33.15 16.13 18.85	30.54 27.92 28.45 28.71 16.30 18.94	30.54 29.38 29.98 30.25 17.04 19.95	39.97 34.62 35.39 35.69 18.35 20.03	27. 26. 27. 16. 19.
2021 2022 2023 2024 2025 2026 2027	0.00 38.03 37.08 37.39 18.17 19.16 21.99	0.00 33.95 31.98 32.26 17.89 19.26 22.09	0.00 27.84 24.31 24.54 17.05 19.33 22.18	0.00 16.63 17.28 17.47 15.80 18.44 20.81	9.64 8.81 12.22 12.38 15.67 18.52 20.81	9.13 11.61 12.57 12.73 15.89 18.60 20.90	25.19 26.27 25.38 25.62 16.13 18.68 20.99	38.95 35.44 34.22 34.52 16.17 18.77 21.09	34.87 34.03 32.86 33.15 16.13 18.85 21.19	30.54 27.92 28.45 28.71 16.30 18.94 21.59	30.54 29.38 29.98 30.25 17.04 19.95 21.39	39.97 34.62 35.39 35.69 18.35 20.03 22.50	27. 26. 27. 16. 19. 21.
2021 2022 2023 2024 2025 2026 2027 2028	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24	30.54 29.38 30.25 17.04 19.95 21.39 22.39	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49	27. 26. 27. 16. 19. 21. 21.
2021 2022 2023 2024 2025 2026 2027 2028 2029	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26	27. 26. 27. 16. 19. 21. 21. 21.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87	27. 26. 27. 16. 19. 21. 21. 21. 21.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.00	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26 21.05	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65	27. 26. 27. 16. 19. 21. 21. 21. 21. 21.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87	27. 26. 27. 16. 19. 21. 21. 21. 21. 21. 21.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.00	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26 21.05	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65	27. 26. 27. 16. 19. 21. 21. 21. 21. 21. 21. 22.
2021 2022 2023 2024 2025 2026 2026 2027 2028 2029 2030 2031 2032	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.00 23.07 23.43	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26 21.05 22.27	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33 22.58	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65 23.96	27. 26. 27. 16. 19. 21. 21. 21. 21. 21. 22. 24.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2030 2031 2032 2033	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.00 23.07 23.43 24.82	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26 21.05 22.27 24.05	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33 22.58 24.38	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65 23.96 25.84	27. 26. 27. 16. 19. 21. 21. 21. 21. 21. 22. 24. 26.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35	0.00 27.84 24.31 17.05 19.33 22.18 23.08 23.00 23.00 23.00 23.07 23.43 24.82 26.48	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26 21.05 22.27 24.05 25.68	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33 22.58 24.38 26.04	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65 23.96 25.84 27.56	27. 26. 27. 16. 21. 21. 21. 21. 21. 22. 24. 26. 26.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26 21.05 22.27 24.05 25.68 25.85	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11	30.54 27.92 28.45 28.71 16.30 21.24 20.98 21.55 21.33 24.38 24.38 26.04 26.32	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62	39.97 34.62 35.39 35.69 18.35 22.50 22.49 22.26 22.87 22.65 23.56 23.56 27.74	27. 26. 27. 16. 19. 21. 21. 21. 21. 21. 22. 24. 26. 26. 27.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.91	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15	25.19 26.27 25.38 25.62 16.13 18.63 18.68 20.99 20.95 20.69 21.26 21.05 22.27 24.05 25.68 25.85 26.27	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98 26.39	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51	30.54 27.92 28.45 28.71 16.30 21.59 21.24 20.98 21.55 21.33 22.58 24.38 26.04 26.32 26.64	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65 23.96 25.84 27.56 27.74 28.22	27. 26. 27. 16. 19. 21. 21. 21. 21. 22. 24. 26. 26. 27. 28.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91 31.10 29.28	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03 31.21	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95 29.58 29.37	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.91 26.81	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03 26.93	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15 27.07 28.39	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.26 21.05 22.27 24.05 25.68 25.85 26.27 27.20	38.95 35.44 34.22 34.52 16.17 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98 26.39 27.31 28.66	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51 27.42	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33 22.58 24.38 26.04 26.64 27.57	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09 29.24	39.97 34.62 35.39 35.69 18.35 20.03 22.49 22.26 22.87 22.65 23.96 25.84 27.74 28.22 29.41	27. 26. 27. 16. 19. 21. 21. 21. 21. 22. 24. 26. 26. 27. 28. 29.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91 31.10 29.28 32.79	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03 31.21 29.40 32.94	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.08 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95 29.55 29.58 29.37 31.51	0.00 16.63 17.28 17.47 15.80 18.44 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.53 26.81 26.81 28.11 29.29	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03 26.93 28.24 29.41	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15 27.07 28.39 29.58	25.19 26.27 25.38 25.62 16.13 18.68 20.99 20.95 20.69 21.05 22.27 24.05 22.27 24.05 25.68 25.85 26.27 27.20 28.52 29.71	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98 26.39 27.31 28.66 29.87	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51 27.42 28.78 30.00	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.53 21.53 22.58 24.38 26.04 26.32 26.64 26.64 27.57 28.93 30.14	30.54 29.38 29.98 30.25 17.04 19.95 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09 29.24 30.61 31.97	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65 23.96 25.84 27.56 27.74 28.22 27.74 28.22 30.75 32.11	27. 26. 27. 16. 21. 21. 21. 21. 21. 22. 24. 26. 26. 27. 28. 29. 30.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2036 2037 2038 2039 2040	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91 31.10 29.28 32.79 32.27	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03 31.21 29.40 32.94 32.30	0.00 27.84 24.31 17.05 19.33 22.18 23.08 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95 29.58 29.58 29.37 31.51 32.25	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.51 26.81 26.81 28.11 29.29 30.95	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03 26.93 28.24 29.41 31.08	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15 27.07 28.39 29.58 31.25	25.19 26.27 25.38 25.62 16.13 18.66 20.99 20.95 20.69 21.26 21.05 22.27 24.05 25.68 22.85 26.85 26.85 26.85 26.27 27.20 28.52 29.71 31.40	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98 26.39 27.31 28.66 29.87 31.54	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51 27.42 28.78 30.00 31.69	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33 22.58 24.38 26.04 26.32 26.64 27.57 28.93 30.14 31.84	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09 29.24 30.61 31.97 37.17	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.65 23.96 25.84 27.56 27.74 28.22 29.41 29.41 30.75 32.11 37.38	27. 26. 27. 19. 21. 21. 21. 21. 21. 22. 24. 26. 26. 26. 27. 28. 29. 30. 32.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2037 2038 2039 2040 2041	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91 31.10 29.28 32.79 32.27 35.30	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03 31.21 29.40 32.94 32.30 35.47	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95 29.58 29.55 29.55 29.55 29.55 29.55 29.55 29.55 29.55 29.57 31.51 32.25 35.76	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.91 26.81 28.11 29.29 30.95 34.33	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03 26.93 26.93 26.93 26.94 26.93 26.94 131.08 34.50	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15 27.07 28.39 29.58 31.25 34.66	25.19 26.27 25.38 25.62 16.13 18.66 20.99 20.95 20.69 21.26 21.05 22.27 24.05 25.68 25.85 26.27 27.20 28.55 26.27 27.20 28.55 29.71 31.40 34.82	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98 26.39 27.31 28.66 29.87 31.54 34.99	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51 27.42 28.78 30.00 31.69 35.16	30.54 27.92 28.45 28.71 16.30 18.94 21.59 21.24 20.98 21.55 21.33 22.58 24.38 24.38 26.04 26.32 26.64 27.57 30.14 31.84 35.34	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09 29.24 30.61 31.97 37.17 38.88	39.97 34.62 35.39 35.69 18.35 20.03 22.50 22.49 22.26 22.87 22.66 25.84 27.56 25.84 27.56 27.74 28.22 29.41 30.75 32.11 37.38 39.06	27. 26. 27. 19. 21. 21. 21. 21. 21. 21. 22. 26. 26. 26. 27. 28. 29. 30. 32. 35.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2037 2038 2039 2040 2041 2042	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91 31.10 29.28 32.79 32.27 35.30 42.36	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03 31.21 29.40 32.94 32.94 32.94 35.47 42.57	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95 29.58 29.37 31.51 32.25 35.76 39.37	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.91 26.81 28.11 29.29 30.95 34.33 37.64	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03 26.93 28.24 29.41 31.08 34.50 37.83	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15 27.07 28.39 29.58 31.25 34.66 38.01	25.19 26.27 25.38 25.62 16.13 18.66 20.99 20.95 20.69 21.26 21.05 22.05 24.05 25.68 25.85 26.27 27.20 28.52 29.71 31.40 34.82 38.19	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98 26.39 27.31 28.66 29.87 31.54 34.99 38.38	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51 27.42 28.78 30.00 31.69 35.16 38.58	30.54 27.92 28.45 28.71 16.30 14.29 21.24 20.98 21.55 21.33 22.58 24.58 24.64 26.32 26.64 27.57 28.93 30.14 30.14 35.34 38.75	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09 29.24 30.61 31.97 37.17 38.88 41.70	39.97 34.62 35.39 35.69 18.35 22.50 22.49 22.26 22.87 22.65 23.56 27.74 28.22 29.41 30.75 32.11 30.75 32.11 37.38 39.06 41.90	27. 26. 27. 19. 21. 21. 21. 21. 21. 21. 24. 26. 26. 26. 27. 28. 29. 30. 32. 35. 39.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2036 2037 2038 2039 2040 2041 2042 2043	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91 31.10 29.28 32.79 32.27 35.30 42.36 51.71	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03 31.21 29.40 32.94 32.30 35.47 42.57 51.87	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95 29.58 29.37 31.51 32.25 35.76 39.37 39.27	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.91 26.81 28.11 29.29 30.95 34.33 37.64 37.74	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03 26.93 28.24 29.41 31.08 34.50 37.83 37.92	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15 27.07 28.39 29.58 31.25 34.66 38.01 38.19	25.19 26.27 25.38 25.62 16.13 18.63 20.99 20.95 20.69 21.26 21.05 22.27 24.05 25.68 25.85 26.68 25.85 26.67 27.20 28.52 29.71 31.40 23.8.19 38.30	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.98 26.39 27.31 28.66 29.87 31.54 34.99 38.38 38.57	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51 27.42 28.78 30.00 31.69 35.16 38.58 38.74	30.54 27.92 28.45 28.71 16.30 21.24 20.98 21.24 20.98 21.55 21.33 22.58 24.38 26.04 26.32 26.64 27.57 28.93 30.14 31.84 35.34 38.75 38.91	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09 29.24 30.61 31.97 37.17 38.88 41.70 41.54	39.97 34.62 35.39 35.69 18.35 22.50 22.49 22.26 22.87 22.65 23.96 25.84 27.56 27.74 28.22 29.41 30.75 32.11 37.38 39.06 41.90 41.84	27. 26. 27. 19. 21. 21. 21. 21. 21. 21. 22. 24. 26. 26. 27. 28. 29. 30. 32. 35. 39. 41.
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042	0.00 38.03 37.08 37.39 18.17 19.16 21.99 23.06 23.05 22.81 23.39 23.22 24.61 26.24 27.24 29.91 31.10 29.28 32.79 32.27 35.30 42.36	0.00 33.95 31.98 32.26 17.89 19.26 22.09 23.16 23.15 22.91 23.49 23.33 24.72 26.35 27.39 30.03 31.21 29.40 32.94 32.94 32.94 35.47 42.57	0.00 27.84 24.31 24.54 17.05 19.33 22.18 23.00 23.00 23.00 23.07 23.43 24.82 26.48 27.55 29.95 29.58 29.37 31.51 32.25 35.76 39.37	0.00 16.63 17.28 17.47 15.80 18.44 20.81 20.67 20.42 20.98 20.77 21.97 23.72 25.33 25.53 25.91 26.81 28.11 29.29 30.95 34.33 37.64	9.64 8.81 12.22 12.38 15.67 18.52 20.81 20.76 20.51 21.07 20.86 22.07 23.83 25.44 25.64 26.03 26.93 28.24 29.41 31.08 34.50 37.83	9.13 11.61 12.57 12.73 15.89 18.60 20.90 20.86 20.60 21.16 20.95 22.17 23.94 25.56 25.75 26.15 27.07 28.39 29.58 31.25 34.66 38.01	25.19 26.27 25.38 25.62 16.13 18.66 20.99 20.95 20.69 21.26 21.05 22.05 24.05 25.68 25.85 26.27 27.20 28.52 29.71 31.40 34.82 38.19	38.95 35.44 34.22 34.52 16.17 18.77 21.09 21.05 20.79 21.36 21.14 22.37 24.16 25.80 25.98 26.39 27.31 28.66 29.87 31.54 34.99 38.38	34.87 34.03 32.86 33.15 16.13 18.85 21.19 21.15 20.88 21.46 21.24 22.48 24.27 25.92 26.11 26.51 27.42 28.78 30.00 31.69 35.16 38.58	30.54 27.92 28.45 28.71 16.30 14.29 21.24 20.98 21.55 21.33 22.58 24.58 24.64 26.32 26.64 27.57 28.93 30.14 30.14 35.34 38.75	30.54 29.38 29.98 30.25 17.04 19.95 21.39 22.39 22.15 22.73 22.55 23.85 25.73 27.44 27.62 28.09 29.24 30.61 31.97 37.17 38.88 41.70	39.97 34.62 35.39 35.69 18.35 22.50 22.49 22.26 22.87 22.65 23.56 27.74 28.22 29.41 30.75 32.11 30.75 32.11 37.38 39.06 41.90	27. 26. 27. 19. 21. 21. 21. 21. 21. 21. 24. 26. 26. 26. 27. 28. 29. 30. 32. 35. 39.

						General E led Cost St							
						k Energy,							
Table S.3a											Nominal \$/N	/Wh	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	0.00	0.00	0.00	0.00	17.51	19.80	45.39	74.09	59.81	36.37	36.88	49.11	
2022	45.11	40.01	29.82	21.16	16.73	19.63	44.60	59.38	51.23	32.70	34.16	42.48	36.4
2023	41.44	37.34	29.57	24.81	22.15	25.63	43.30	55.38	43.77	32.70	34.06	40.75	35.
2024	41.51	37.41	29.65	24.89	22.22	25.70	43.37	55.46	43.85	32.78	34.13	40.83	36.
2025	17.03	16.75	15.91	14.66	14.53	14.75	14.99	15.03	14.99	15.16		17.21	15.
2026	18.00	18.09	18.16	17.28	17.36	17.44	17.52	17.61	17.69	17.78	18.78	18.87	17.
2027	20.80	20.90	20.99	19.62	19.62	19.72	19.81	19.91	20.01	20.40		21.32	20.
2028	21.84	21.95	21.87	19.46	19.55	19.65	19.74	19.84	19.93	20.03		21.28	20.
2029	21.81	21.92	21.76	19.18	19.27	19.36	19.45	19.55	19.65	19.74		21.02	20
2030	21.54	21.65	21.74	19.72	19.81	19.90	20.00	20.10	20.20	20.29	21.47	21.61	20
2031	22.10	22.21	21.78	19.48	19.57	19.67	19.76	19.85	19.95	20.05	21.27	21.37	20.
2031	21.91	22.21	22.11	20.66	20.76	20.86	20.96	21.06	21.16	20.05		21.57	20.
2032	23.27	23.38	23.48	20.00	20.70	20.00	20.30		22.93	23.04	24.39	22.04	23.
								22.82					
2034	24.87	24.98	25.11	23.96	24.07	24.19	24.31	24.43	24.55	24.67		26.19	24.
2035	25.85	25.99	26.15	24.13	24.25	24.35	24.46	24.58	24.72	24.93	26.22	26.34	25
2036	28.48	28.60	28.52	24.48	24.60	24.72	24.84	24.97	25.09	25.21	26.67	26.79	26.
2037	29.64	29.76	28.12	25.36	25.48	25.61	25.74	25.85	25.97	26.11	27.78	27.95	26
2038	27.79	27.92	27.88	26.63	26.75	26.90	27.04	27.17	27.30	27.44		29.27	27
2039	31.28	31.42	29.99	27.78	27.89	28.07	28.19	28.36	28.49	28.63		30.59	29
2040	30.72	30.76	30.71	29.40	29.53	29.70	29.86	29.99	30.15	30.29		35.83	31.
2041	33.72	33.89	34.19	32.76	32.92	33.08	33.24	33.41	33.59	33.76		37.48	34.
2042	40.76	40.96	37.76	36.03	36.22	36.40	36.58	36.77	36.97	37.15	40.09	40.30	37
2043	50.07	50.23	37.63	36.10	36.28	36.55	36.66	36.92	37.10	37.27	39.89	40.20	39
2044	42.78	42.66	40.15	38.60	38.86	38.99	39.19	39.48	39.66	39.80	44.01	44.34	40
2045	47.56	47.68	40.34	39.12	39.31	39.54	39.77	39.86	40.15	40.36	45.37	45.63	42
2046	52.38	52.44	41.70	40.17	40.40	40.58	40.79	41.17	41.21	41.45	48.43	48.70	44
					Portland	General E	loctric						
						ed Cost St							
					Atolu								
					Off-Pea	k Energy	Solar						
able S.3b					Off-Pea	k Energy, S	Solar				Nominal \$/N	1Wh	
able S.3b					Off-Pea	k Energy, S	Solar				Nominal \$/N	1Wh	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annua
	Jan 0.00	Feb 0.00	Mar 0.00	Apr 0.00			Jul 24.14	Aug 37.90	Sep 33.82				Annua
Year					May	Jun	Jul			Oct	Nov	Dec	Annua 25.
Year 2021	0.00	0.00	0.00	0.00	May 8.59	Jun 8.08	Jul 24.14	37.90	33.82	Oct 29.49	Nov 29.49	Dec 38.92	25
Year 2021 2022	0.00 36.96	0.00 32.88	0.00 26.76	0.00 15.56	May 8.59 7.74	Jun 8.08 10.53	Jul 24.14 25.20	37.90 34.37	33.82 32.95	Oct 29.49 26.85	Nov 29.49 28.31	Dec 38.92 33.55	25 25
Year 2021 2022 2023	0.00 36.96 35.98	0.00 32.88 30.88	0.00 26.76 23.21	0.00 15.56 16.19	May 8.59 7.74 11.12	Jun 8.08 10.53 11.48	Jul 24.14 25.20 24.28	37.90 34.37 33.13	33.82 32.95 31.76	Oct 29.49 26.85 27.36	Nov 29.49 28.31 28.88	Dec 38.92 33.55 34.29	25 25 25
Year 2021 2022 2023 2024 2025	0.00 36.96 35.98 36.27 17.03	0.00 32.88 30.88 31.14 16.75	0.00 26.76 23.21 23.42 15.91	0.00 15.56 16.19 16.35 14.66	May 8.59 7.74 11.12 11.26 14.53	Jun 8.08 10.53 11.48 11.62 14.75	Jul 24.14 25.20 24.28 24.50 14.99	37.90 34.37 33.13 33.40 15.03	33.82 32.95 31.76 32.03 14.99	Oct 29.49 26.85 27.36 27.60 15.16	Nov 29.49 28.31 28.88 29.13 15.90	Dec 38.92 33.55 34.29 34.57 17.21	25 25 25 15
Year 2021 2022 2023 2024 2025 2026	0.00 36.96 35.98 36.27 17.03 18.00	0.00 32.88 30.88 31.14 16.75 18.09	0.00 26.76 23.21 23.42 15.91 18.16	0.00 15.56 16.19 16.35 14.66 17.28	May 8.59 7.74 11.12 11.26 14.53 17.36	Jun 8.08 10.53 11.48 11.62 14.75 17.44	Jul 24.14 25.20 24.28 24.50 14.99 17.52	37.90 34.37 33.13 33.40 15.03 17.61	33.82 32.95 31.76 32.03 14.99 17.69	Oct 29.49 26.85 27.36 27.60 15.16 17.78	Nov 29.49 28.31 28.88 29.13 15.90 18.78	Dec 38.92 33.55 34.29 34.57 17.21 18.87	25 25 25 15 17
Year 2021 2022 2023 2024 2025 2026 2027	0.00 36.96 35.98 36.27 17.03 18.00 20.80	0.00 32.88 30.88 31.14 16.75 18.09 20.90	0.00 26.76 23.21 23.42 15.91 18.16 20.99	0.00 15.56 16.19 16.35 14.66 17.28 19.62	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81	37.90 34.37 33.13 33.40 15.03 17.61 19.91	33.82 32.95 31.76 32.03 14.99 17.69 20.01	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32	25 25 25 15 17 20
Year 2021 2022 2023 2024 2025 2026 2027 2028	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28	25 25 25 15 17 20 20
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02	25 25 15 17 20 20 20
Year 2021 2022 2023 2024 2025 2026 2027 2028 2027 2028 2029 2030	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72	<u>Maγ</u> 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61	25 25 15 17 20 20 20 20
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2029 2030 2031	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.30 19.67	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37	25 25 15 17 20 20 20 20 20 20
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2029 2030 2031 2032	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.40 20.03 19.74 20.29 20.05 21.26	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54	Dec 38 92 33 55 34 29 34 57 17.21 18.87 21.32 21.28 21.02 21.01 21.37 22.64	25 25 15 17 20 20 20 20 20 20 20
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2031 2032 2033	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.84 21.81 21.54 22.10 21.91 23.27	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.95 21.92 21.65 22.21 22.01 23.38	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.74 21.78 22.11 23.48	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.05 21.26 23.04	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39	Dec 38.92 33.55 34.29 34.27 17.21 18.87 21.32 21.28 21.02 21.61 21.61 22.64 24.50	25 25 25 15 17 20 20 20 20 20 20 21 23
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.05 21.26 23.04 23.04	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.50 26.19	25 25 15 17 20 20 20 20 21 23 24
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034         2035	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.17 23.48 25.11 23.48	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 23.04 24.67 24.93	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.50 26.19 26.34	25 25 25 15 17 20 20 20 20 20 21 23 24 23 24
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034         2035         2036	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 21.26 23.467 24.93 25.21	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22 26.67	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.59 26.34 26.79	25 25 25 15 17 20 20 20 20 20 21 23 24 23 24 25 26
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2034         2035         2036         2037	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60 29.76	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97 25.85	33.82 32.95 31.76 32.03 14.99 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 23.04 24.93 25.21 26.11	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22 26.67 27.78	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.50 26.34 26.79 27.95	25 25 25 15 17 20 20 20 20 20 20 21 23 24 25 26 26 26
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034         2035         2036	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64 27.79	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 21.26 23.467 24.93 25.21	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22 26.67 27.78	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.59 26.34 26.79	25 25 25 15 17 20 20 20 20 20 20 21 23 24 25 26 26 26
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2034         2035         2036         2037	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60 29.76	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97 25.85	33.82 32.95 31.76 32.03 14.99 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 23.04 24.93 25.21 26.11	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22 26.67 27.78 29.12	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.50 26.34 26.79 27.95	25 25 25 15 17 20 20 20 20 21 23 24 25 26 26 26 27
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64 27.79	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 24.98 25.99 28.60 29.76 27.92	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12 27.88	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36 26.63	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48 26.75	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61 26.90	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74 27.04	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.58 24.97 25.85 27.17	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97 27.30	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 23.04 24.67 24.93 25.21 26.11 27.44	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.62 26.67 27.78 29.12 30.46	Dec 38 92 33 55 34 29 34 57 17 21 18.87 21.32 21.28 21.02 21.02 21.02 21.02 24.50 26.19 26.34 26.34 26.34 26.34 26.34 27.95 29.27	25 25 25 15 17 20 20 20 20 21 23 24 25 26 26 26 27 29
Year         2021         2022         2023         2024         2025         2026         2027         2028         2030         2031         2032         2033         2034         2035         2036         2037         2038         2039	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64 27.79 31.28 30.72	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60 29.76 27.92 31.42	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12 27.88 29.99 30.71	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36 26.63 27.78	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48 26.75 27.89 29.53	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61 26.90 28.07 29.70	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74 27.04 28.19	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97 25.85 27.17 28.36 29.99	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97 27.30 28.49 30.15	Oct 29.49 26.85 27.60 27.60 27.60 27.60 27.00 27.00 27.00 20.03 19.74 20.05 21.26 23.04 24.67 24.93 25.21 26.21 26.14 27.44 28.63 30.29	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 21.27 22.54 24.39 26.07 26.67 26.67 27.78 29.12 30.46 35.62	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 24.50 26.19 26.34 26.79 27.30 29.27 30.59	25 25 25 15 20 20 20 20 21 23 24 25 26 27 29 21 31
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034         2035         2036         2037         2038         2039         2034         2035         2036         2037         2038         2039         2040         2041	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64 27.79 31.28 30.72 33.72	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60 29.76 27.92 31.42 30.76 33.89	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12 27.88 29.99 30.71 34.19	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36 26.63 27.78 29.40 32.76	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48 26.75 27.89 29.53 32.92	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61 26.90 28.07 29.70 33.08	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74 27.04 28.19 29.86 33.24	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97 25.85 27.17 28.36 29.99 33.41	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97 27.30 28.49 30.15 33.59	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.09 20.05 21.26 23.04 24.67 24.93 25.21 26.11 27.44 28.63 30.29 33.76	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22 26.67 27.78 29.12 30.46 35.62 37.30	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.50 26.19 26.34 26.79 27.95 29.57 30.59 35.83 37.48	25 25 25 15 17 20 20 20 20 20 20 20 20 20 20 20 20 20
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034         2035         2036         2037         2038         2039         2040         2041         2042	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64 27.79 31.28 30.72 33.72 40.76	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60 29.76 27.92 31.42 30.76 33.89 40.96	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12 27.88 29.99 30.71 34.19 37.76	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36 26.63 27.78 29.40 32.76 36.03	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48 26.75 27.89 29.53 32.92 36.22	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61 26.90 28.07 29.70 33.08 36.40	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74 27.04 28.19 29.86 33.24 36.58	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97 25.85 27.17 28.36 29.99 33.41 36.77	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97 27.30 28.49 30.15 33.59 36.97	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 23.04 24.67 24.93 25.21 26.11 27.44 28.61 27.44 28.029 33.76 37.15	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22 26.67 27.78 29.12 30.46 35.62 37.30 40.09	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.50 26.19 26.34 26.79 27.95 29.27 30.59 35.53 37.48 40.30	25. 25 25 15. 17. 20 20 20 20 20 20 20 20 20 20 20 20 20
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034         2035         2036         2037         2038         2039         2040         2041         2042         2043	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64 27.79 31.28 30.72 33.72 40.76 50.07	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60 29.76 27.92 31.42 30.76 33.89 40.96 50.23	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12 27.88 29.99 30.71 34.19 37.76 37.63	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36 26.63 27.78 29.40 32.76 36.03 36.10	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48 26.75 27.89 29.53 32.92 36.28	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61 26.90 28.07 29.70 33.08 36.40 36.55	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74 27.04 28.19 29.86 33.24 36.58 36.66	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97 25.85 27.17 28.36 29.99 33.41 36.77 36.92	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97 27.30 28.49 30.15 33.59 36.97 37.10	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 21.26 21.26 21.26 21.26 21.26 21.26 21.26 21.26 21.26 23.37 25.21 26.11 27.44 28.63 30.27 33.76 37.15 37.27	Nov 29.49 28.31 28.88 29.13 15.90 21.18 20.92 21.47 21.27 21.47 21.27 22.54 24.39 26.07 26.22 26.67 27.78 29.12 30.46 35.62 37.30 40.09 39.89	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.64 26.79 26.34 26.79 27.95 29.27 30.59 35.58 37.48 40.30 40.20	25. 25. 25. 15. 17. 20. 20. 20. 20. 20. 20. 20. 20. 20. 20
2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2034 2035 2036 2037 2038 2037 2038 2039 2040 2041 2042	0.00 36.96 35.98 36.27 17.03 18.00 20.80 21.84 21.81 21.54 22.10 21.91 23.27 24.87 25.85 28.48 29.64 27.79 31.28 30.72 33.72 40.76	0.00 32.88 30.88 31.14 16.75 18.09 20.90 21.95 21.92 21.65 22.21 22.01 23.38 24.98 25.99 28.60 29.76 27.92 31.42 30.76 33.89 40.96	0.00 26.76 23.21 23.42 15.91 18.16 20.99 21.87 21.76 21.74 21.78 22.11 23.48 25.11 26.15 28.52 28.12 27.88 29.99 30.71 34.19 37.76	0.00 15.56 16.19 16.35 14.66 17.28 19.62 19.46 19.18 19.72 19.48 20.66 22.38 23.96 24.13 24.48 25.36 26.63 27.78 29.40 32.76 36.03	May 8.59 7.74 11.12 11.26 14.53 17.36 19.62 19.55 19.27 19.81 19.57 20.76 22.49 24.07 24.25 24.60 25.48 26.75 27.89 29.53 32.92 36.22	Jun 8.08 10.53 11.48 11.62 14.75 17.44 19.72 19.65 19.36 19.90 19.67 20.86 22.60 24.19 24.35 24.72 25.61 26.90 28.07 29.70 33.08 36.40	Jul 24.14 25.20 24.28 24.50 14.99 17.52 19.81 19.74 19.45 20.00 19.76 20.96 22.71 24.31 24.46 24.84 25.74 27.04 28.19 29.86 33.24 36.58	37.90 34.37 33.13 33.40 15.03 17.61 19.91 19.84 19.55 20.10 19.85 21.06 22.82 24.43 24.58 24.97 25.85 27.17 28.36 29.99 33.41 36.77	33.82 32.95 31.76 32.03 14.99 17.69 20.01 19.93 19.65 20.20 19.95 21.16 22.93 24.55 24.72 25.09 25.97 27.30 28.49 30.15 33.59 36.97	Oct 29.49 26.85 27.36 27.60 15.16 17.78 20.40 20.03 19.74 20.29 20.05 21.26 23.04 24.67 24.93 25.21 26.11 27.44 28.61 27.44 28.029 33.76 37.15	Nov 29.49 28.31 28.88 29.13 15.90 18.78 20.20 21.18 20.92 21.47 21.27 22.54 24.39 26.07 26.22 26.67 27.78 29.12 30.46 35.62 37.30 40.09 39.89 44.01	Dec 38.92 33.55 34.29 34.57 17.21 18.87 21.32 21.28 21.02 21.61 21.37 22.64 24.50 26.19 26.34 26.79 27.95 29.27 30.59 35.53 37.48 40.30	25. 25 25 15. 17. 20 20 20 20 20 20 20 20 20 20 20 20 20

						General E							
		_				ed Cost St							
	1	Pro	jected On	Peak Reso	ource Suffi	ciency Pe	riod Delive	red Whole	sale Price	S	March 102	A1 A /I-	
Table S.4											Nominal \$/I	VIVVh	
Year	lan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	Jan -	reb -	Mar	Apr -	May 18.89	21.19	46.77	75.47	61.20	37.75	38.26	50.49	29.30
									52.64				
2022	46.52	41.43	31.23	22.57	18.14	21.04	46.01	60.79		34.11	35.58	43.89	37.87
2023	42.88	38.78	31.01	26.25	23.59	27.07	44.74	56.82	45.21	34.14	35.50	42.19	37.40
2024	42.98	38.88	31.12	26.36	23.69	27.17	44.84	56.93	45.32	34.25	35.60	42.30	37.46
2025	-	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-	
2045	-	-	-	-	-	-	-	-	-	-	-		
2046	-	-	-	-	-	-	-	-	-	-	-	-	
2040					D (1 )								
						General E							
						ed Cost St							
T		Pro	jected Off	Peak Reso	ource Suffi	ciency Per	riod Delive	red Whole	sale Price	S			
Table S.5											Nominal \$/I	VIVVh	
Year	Jan	Feb	Mar	Apr	Mov	Jun	Jul	Aug	Sep	Oct	Nev	Dec	Appual
2021	Jan	rep	IVIAI	Apr	May 9.97	9.46	25.52	Aug 39.28	35.20	30.87	Nov 30.87	40.30	Annual 18.69
2021	38.37	24.20	28.17	16.97	9.15	11.95	26.61	35.78	34.37	28.26	29.72	34.96	27.37
		34.29											
2023	37.42	32.32	24.65	17.63	12.56	12.92	25.72	34.57	33.21	28.80	30.32	35.73	27.14
2024	37.74	32.61	24.89	17.82	12.73	13.09	25.97	34.87	33.50	29.07	30.60	36.04	27.43
2025	-	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
2032				-	-	-	-	-	-	-	-	-	-
	-	-	-				-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-						
2032 2033	-	-	-	-	-	-	-	-	-	-	-	-	
2032 2033 2034								-	-	-	-	-	-
2032 2033 2034 2035 2036	-	-	-	-	-	-	-						-
2032 2033 2034 2035 2036 2037			-	-				-	-	-	-	-	-
2032 2033 2034 2035 2036 2037 2038	-	-		-	-	-	-	-	-	-	-	-	-
2032 2033 2034 2035 2036 2037 2038 2039	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -				- - - -		-
2032 2033 2034 2035 2036 2037 2038 2039 2040	- - - - -	- - - - -	- - - - -	- - - - -				- - - -	- - - -	- - - -	- - - - -	- - - - -	
2032         2033         2034         2035         2036         2037         2038         2039         2040         2041	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - -	- - - - - - -	- - - - - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	-
2032 2033 2034 2035 2036 2037 2038 2039 2040 2040 2041 2042	-   -   -   -   -   -   -	- - - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - -	- - - - - -	- - - - - - -	- - - - - -	- - - - - - -	- - - - - - -	
2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043	- - - - - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - -	- - - - - - - -	- - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	
2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	• • • • • • •	
2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043	- - - - - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - -	- - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	

						General E						
				Tatal D		ed Cost Stu						
Table S.6				Total P	rojected O	ther Fixed	Avoided	JOSIS		1	Nominal \$/N	/Wh
Year	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.56	3.5
2026	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.6
2027	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.7
2028	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.7
2029	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.8
2030	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.9
2031	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.0
2032	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.09	4.0
2033	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.1
2034	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.2
2035	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.3
2036	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.4
2037	4.54	4.54	4.54	4.54	4.54	4.54	4.54	4.54	4.54	4.54	4.54	4.5
2038	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.6
2039	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.1
2040	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.8
2041	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.9
2042	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.0
2043	5.12	5.12	5.12	5.12	5.12	5.12	5.12	5.12	5.12	5.12	5.12	5.1
2044	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.2
2045	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.3
2046	5.43	5.43	5.43	5.43	5.43	5.43	5.43	5.43	5.43	5.43	5.43	5.4
						ed Cost Stu		-				
able S.7				Total Pr		ed Cost Stu oided Vari		Costs		L.	Nominal \$/M	1Wh
					ojected Av	oided Vari	able O&M				Nominal \$/M	
Year	Jan	Feb	Mar	Total Pro	ojected Av May	oided Vari Jun	able O&M	Aug	Sep	Oct	Nov	1Wh Dec
Year 2021				Apr	ojected Av Maγ -	oided Vari Jun -	able O&M Jul	Aug -		Oct	Nov	
Year 2021 2022	-	-	-	Apr -	ojected Av May -	oided Vari Jun - -	able O&M Jul -	Aug - -	-	Oct - -	Nov -	Dec -
Year 2021 2022 2023	-	-	-	Apr - -	ojected Av Maγ - - -	oided Vari Jun - - -	able O&M 	Aug - - -	-	Oct - - -	Nov	Dec - -
Year 2021 2022 2023 2024	-	-	-	Apr - - -	ojected Av Maγ - - - -	Jun - - - - -	able O&M 	Aug - - - -		Oct - - - -	Nov - - - -	Dec - - -
Year 2021 2022 2023 2024 2025	- - - 0.84	- - - 0.84		Apr - - - 0.84	ojected Αν Μaγ - - - - - 0.84	Jun - - - - - 0.84	able O&M Jul - - - - 0.84	Aug - - - - 0.84	- - - 0.84	Oct - - - - 0.84	Nov - - - - 0.84	Dec - - - - 0.8
Year 2021 2022 2023 2024 2025 2026	- - 0.84 0.86	- - 0.84 0.86	- - 0.84 0.86	Apr - - 0.84 0.86	May - - - 0.84 0.86	oided Vari Jun - - - 0.84 0.86	able O&M 	Aug - - - 0.84 0.86	- - - 0.84 0.86	Oct - - - 0.84 0.86	Nov - - 0.84 0.86	Dec - - - - 0.8
Year 2021 2022 2023 2024 2025 2026 2027	- - 0.84 0.86 0.88	- - 0.84 0.86 0.88	- - 0.84 0.86 0.88	Apr - - 0.84 0.86 0.88	May - - 0.84 0.86 0.88	oided Vari	able O&M 	Aug - - - 0.84 0.86 0.88	- - - 0.84 0.86 0.88	Oct - - 0.84 0.86 0.88	Nov - - 0.84 0.86 0.88	Dec - - - 0.8 0.8
Year 2021 2022 2023 2024 2025 2026 2027 2028	- - 0.84 0.86 0.88 0.89	- - 0.84 0.86 0.88 0.89	- - 0.84 0.86 0.88 0.89	Apr - - 0.84 0.86 0.88 0.89	0jected Av May - - 0.84 0.86 0.88 0.89	Un	Jul - - - 0.84 0.86 0.88 0.89	Aug - - - 0.84 0.86 0.88 0.89	- - - 0.84 0.86 0.88 0.88	Oct - - 0.84 0.86 0.88 0.89	Nov - - 0.84 0.86 0.88 0.89	Dec - - - 0.8 0.8 0.8
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029	- 0.84 0.86 0.88 0.89 0.91	- - - 0.84 0.86 0.88 0.89 0.91	- 0.84 0.86 0.88 0.89 0.91	Apr - - 0.84 0.86 0.88 0.89 0.91	May - - 0.84 0.86 0.88 0.89 0.91	Jun - - - 0.84 0.86 0.88 0.89 0.91	Jul - - 0.84 0.86 0.88 0.89 0.91	Aug - - 0.84 0.86 0.88 0.89 0.91	- - - - 0.84 0.86 0.88 0.89 0.91	Oct - - 0.84 0.86 0.88 0.89 0.91	Nov - - 0.84 0.86 0.88 0.89 0.91	Dec - - - 0.8 0.8 0.8 0.8
Year 2021 2022 2023 2024 2025 2026 2027 2028 2028 2029 2030	- - 0.84 0.86 0.88 0.89 0.91 0.93	- - 0.84 0.86 0.88 0.89 0.91 0.93	- - 0.84 0.86 0.88 0.89 0.91 0.93	Apr - - - - - - - - - - - - - - - - - - -	May - - - - - - - - - - - - - - - - - - -	Jun - - - - - - - - - - - - - - - - - - -	Jul - - - - - - - - - - - - - - - - - - -	Aug - - - - - - - - - - - - - - - - - - -	- - - 0.84 0.86 0.88 0.89 0.91 0.93	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93	Nov - - - 0.84 0.86 0.88 0.89 0.91 0.93	Dec - - - - - - - - - - - - - - - - - - -
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031	- - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95	- - 0.84 0.86 0.88 0.89 0.91 0.93 0.95	- - 0.84 0.86 0.88 0.89 0.91 0.93 0.95	Apr 	May - - - - - - - - - - - - - - - - - - -	Jun - - - - - - - - - - - - - - - - - - -	Jul - - - - - - - - - - - - - - - - - - -	Aug - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95	- - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95	Oct - - 0.84 0.86 0.88 0.88 0.89 0.91 0.93 0.95	Nov - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95	Dec - - - 0.8 0.8 0.8 0.8 0.8 0.8 0.9 0.9 0.9
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2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	Apr - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	May - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	Jun - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	Jul - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	Aug - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	Nov - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99	Dec - - - - 0.8 0.8 0.8 0.8 0.8 0.5 0.5 0.5 0.5 0.5 0.5
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2030 2031 2032 2033 2034	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	- 0.84 0.86 0.88 0.91 0.93 0.95 0.97 0.99 1.01	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	Apr - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	May - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	Jun - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	Jul - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	Aug - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	Nov - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01	Dec    0.8 0.8 0.8 0.8 0.8 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Apr - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	May         -         -         0.84         0.86         0.89         0.91         0.93         0.95         0.97         0.99         1.01	Jun - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Jul - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Aug - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Nov - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Dec 
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Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Apr - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	May         -         -         0.84         0.86         0.89         0.91         0.93         0.95         0.97         0.99         1.01	Jun - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Jul - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Aug - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Nov - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03	Dec 
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Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.95 0.97 0.99 1.01 1.03 1.05 1.07	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.95 0.97 0.99 1.01 1.03 1.05 1.07	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.95 0.97 0.99 1.01 1.03 1.05 1.07	Apr - - - - - - - - - - - - - - - - - - -	May - - - - - - - - - - - - - - - - - - -	Jun         -         -         -         0.84         0.86         0.88         0.89         0.91         0.93         0.95         0.97         0.99         1.01         1.03         1.05	Jul - - - - - - - - - - - - - - - - - - -	Aug - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07	Nov - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07	Dec 
Year 2021 2022 2023 2024 2025 2026 2027 2028 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038	- - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10	- 0.84 0.86 0.88 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10	- - - - - - - - - - - - - - - - - - -	Apr - - - - - - - - - - - - - - - - - - -	May         -         -         0.84         0.86         0.88         0.91         0.93         0.95         0.97         0.99         1.01         1.05         1.07         1.10	Jun         -         -         -         -         0.84         0.86         0.88         0.89         0.91         0.93         0.95         0.97         0.99         1.01         1.03         1.05         1.07         1.10	Jul - - - - - - - - - - - - - - - - - - -	Aug - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10	- - - - - - - - - - - - - - - - - - -	Oct - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10	Nov - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10	Dec 
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Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2033 2034 2035 2036 2037 2038 2039 2039 2040	- 0.84 0.86 0.88 0.99 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14	Apr - - - - - - - - - - - - - - - - - - -	May - - - - - - - - - - - - - - - - - - -	Jun         -         -         -         0.84         0.86         0.88         0.89         0.91         0.93         0.95         0.97         0.99         1.01         1.03         1.05         1.07         1.10         1.12         1.14	Jul - - - - - - - - - - - - - - - - - - -	Aug - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14	Nov - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14	Dec 
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2034 2035 2036 2037 2038 2039 2039 2040 2041	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16	Apr - - - - - - - - - - - - - - - - - - -	May         -         -         -         -         -         -         -         -         -         0.84         0.86         0.88         0.93         0.95         0.97         0.99         1.01         1.03         1.05         1.07         1.10         1.12         1.14	Jun - - - - - - - - - - - - -	Jul - - - - - - - - - - - - - - - - - - -	Aug - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16	Nov - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16	Dec 
Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2036 2037 2038 2039 2040 2041 2042	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19	Apr - - - - - - - - - - - - - - - - - - -	May         -         -         -         -         -         -         -         -         -         0.84         0.86         0.88         0.93         0.95         0.97         0.99         1.01         1.03         1.05         1.07         1.10         1.12         1.14         1.16         1.19	Jun         -         -         -         -         -         -         -         -         0.84         0.86         0.88         0.89         0.91         0.93         0.95         0.97         0.99         1.01         1.03         1.05         1.07         1.10         1.12         1.14         1.16         1.19	Jul - - - - - - - - - - - - - - - - - - -	Aug - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19	Nov - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19	Dec - -
Year         2021         2022         2023         2024         2025         2026         2027         2028         2029         2030         2031         2032         2033         2034         2035         2036         2037         2038         2039         2040         2041         2042         2043	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19 1.21	- 0.84 0.86 0.88 0.99 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19 1.21	- 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19 1.21	Apr - - - - - - - - - - - - - - - - - - -	May - - - - - - - - - - - - - - - - - - -	Jun         -         -         -         -         0.84         0.86         0.89         0.91         0.93         0.95         0.97         0.99         1.01         1.03         1.05         1.07         1.10         1.12         1.14         1.16         1.19         1.21	Jul - - - - - - - - - - - - - - - - - - -	Aug - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19 1.21	- - - - - - - - - - - - - - - - - - -	Oct - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19 1.21	Nov - - - 0.84 0.86 0.88 0.89 0.91 0.93 0.95 0.97 0.99 1.01 1.03 1.05 1.07 1.10 1.12 1.14 1.16 1.19 1.21	Dec 

						General E							
				т.,		ed Cost St							
able S.8				lot	al Projecte	ed Avoided	Fuel Cost	S			Nominal \$/	MM/b	
able 5.0											Nominal wi	****	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annua
2021	-	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-	-
2025	14.13	13.85	13.01	11.77	11.63	11.85	12.10	12.13	12.09	12.26	13.00	14.31	12.6
2026	15.04	15.13	15.20	14.32	14.40	14.48	14.56	14.65	14.73	14.82	15.83	15.91	14.9
2027	17.78	17.89	17.98	16.60	16.60	16.70	16.79	16.89	16.99	17.39	17.18	18.30	17.2
2028	18.77	18.88	18.80	16.39	16.48	16.58	16.67	16.77	16.87	16.96	18.11	18.21	17.4
2029	18.67	18.77	18.62	16.04	16.13	16.22	16.31	16.41	16.50	16.60	17.77	17.88	17.1
2030	18.34	18.44	18.53	16.51	16.60	16.70	16.79	16.89	16.99	17.08	18.26	18.40	17.4
2031	18.83	18.93	18.51	16.21	16.30	16.39	16.49	16.58	16.68	16.77	17.99	18.09	17.3
2032	18.58	18.69	18.78	17.33	17.43	17.53	17.63	17.73	17.83	17.93	19.21	19.32	18.1
2033	19.86	19.97	20.07	18.97	19.08	19.19	19.30	19.41	19.52	19.63	20.98	21.09	19.7
2034	21.39	21.51	21.63	20.48	20.59	20.71	20.83	20.95	21.08	21.19	22.59	22.71	21.3
2035	22.30	22.44	22.60	20.58	20.70	20.80	20.91	21.03	21.17	21.38	22.67	22.79	21.6
2036	24.87	24.99	24.91	20.87	20.99	21.11	21.23	21.36	21.48	21.60	23.06	23.18	22.4
2037	25.95	26.06	24.42	21.66	21.78	21.92	22.05	22.16	22.27	22.42	24.09	24.26	23.2
2038	24.02	24.14	24.11	22.85	22.98	23.13	23.26	23.40	23.53	23.67	25.35	25.50	23.8
2039	27.43	27.58	26.14	23.93	24.04	24.22	24.34	24.51	24.64	24.78	26.61	26.74	25.4
2040	26.81	26.84	26.79	25.49	25.62	25.79	25.94	26.07	26.23	26.38	31.71	31.92	27.1
2041 2042	29.71 36.66	29.88 36.87	30.18 33.67	28.75 31.94	28.91 32.13	29.08 32.31	29.24 32.49	29.41 32.68	29.58 32.88	29.75	33.30 36.00	33.48 36.20	30.1 33.8
2042	45.90	46.06	33.45	31.94	32.13	32.31	32.49	32.00	32.00	33.05 33.09	35.72	36.02	35.3
2043	38.54	38.41	35.90	34.35	34.61	34.75	34.94	35.23	35.42	35.55	39.72	40.09	36.4
2044	43.23	43.35	36.01	34.35	34.98	35.21	35.43	35.53	35.82	36.02	41.04	40.09	30.4
2045	43.23	43.35	37.28	35.75	35.97	36.16	36.36	36.75	36.79	37.02	41.04	41.29	39.6
2040	41.30	40.01	31.20	33.75					30.73	31.02	44.01	44.20	33.0
						Portland G							
				_			Cost Stud						
				Forecas	ted Gas Pr	rice - GPf (	/MMBtu -	without tra	nsportatio	n)	No. 100		
able S.9a											Nominal \$/	VIIVIDTU	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annua
2021	Jan -	- Feb	Iviar -	- Apr	iviay	Jun	-	Aug -	- Sep		-	Dec -	Annua
2021	-	-	-	-	-	-	-	-	-	-	-		-
2022	-	-	_			_	-	-	-	-	-	-	
2024	-	_	_	-	-	_	-	-	-	_	-	_	-
2025													1.8
2026													2.2
2027													2.5
2028													2.5
2029													2.5
2030													2.5
2031													2.5
2032													2.6
2033													2.9
2034													3.1
2035													3.2
2036													3.3
2037													3.4
2038													3.
2039													3.1
2040													4.(
2041													4.4
2042													5.0
2043													5.2
													5.4
2044													_
2044 2045 2046													5.0 5.1

					Portlan	d General	Electric						
						ded Cost S							
			Forec	asted Gas	Price - GP	f (\$/MMBtu	- includin	g transport	ation)				
Table S.9b	)										Nominal \$/	MMbtu	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annua
2021	-	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-	-
2025													1.93
2026													2.28
2027													2.64
2028													2.67
2029													2.62
2030													2.67
2031													2.64
2032													2.77
2033													3.02
2034													3.26
2035													3.30
2036													3.44
2037													3.56
2038													3.64
2039													3.89
2040													4.15
2041													4.61
2042													5.20
2043													5.42
2044													5.59
2045													5.78
2046													6.09

# **Standard Capacity Tables**

					Portland	General El	ectric					
						ed Cost Stu						
				0		pacity, Ba						
Table S.10a	a									N	lominal \$/N	1Wh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31
2026	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85
2027	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40
2028	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96
2029	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54
2030	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12
2031	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72
2032	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13
2033	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95
2034	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68
2035	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23
2036	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78
2037	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56
2038	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25
2039	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95
2030	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67
2040	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40
2041	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14
2042	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91
2043	38.56	38.56	38.56	38.56	38.56	38.56	38.56	38.56	38.56	38.56	38.56	38.56
2044	39.60	39.60	39.60	39.60	39.60	39.60	39.60	39.60	39.60	39.60	39.60	39.60
2045	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28
2040	40.20	40.20	40.20	40.20				40.20	40.20	40.20	40.20	40.20
						General El ed Cost Stu						
				0		pacity, Ba	1					
Table S.10	h			Ĭ	ii reak ca	ιρατιτγ, υα	se Luau			N	lominal \$/N	1W/h
	5										orrinnar w/rv	
Year	Jan	Feb	Mar	Apr	Mav	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	_	_	_	_	_	_	_	-
2023	-	-	-	-	_	_	_	-	_	_	_	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	_	-	_	_	-	-	_	-	_	-
2020	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-
		-										

2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-

						nd Genera						
						ided Cost						
able S.11	-				On Pe	ak Capaci	ty, wina				Nominal \$/N	A) A //-
able 5.1	a										Nominal \$/1	IVVII
Year	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	De
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47
2026	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79
2027	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11
2028	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44
2029	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78
2030	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12
2031	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47
2032	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72
2033	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20
2034	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63
2035	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.99
2036	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28
2037	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73
2038	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14
2039	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55
2040	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.9
2041	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40
2042	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.8
2043	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.2
2044	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.6
2045	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.2
2046	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.6
					Portla	nd Genera	Electric					

#### Avoided Cost Study Off Peak Capacity, Wind

					Off Pea	ik Capacit	y, wind					
Table S.11	b										Nominal \$/M	Wh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	De
2021	-	-	-	-	-	-	-	-	-	-	-	-
2021	_	-	_	_	-	-	-	-	-	-	-	-
2022	_	-	_	_	-	-	_	-	-	-	-	-
2023	_	-	-	-		_	-	-	-	-	_	-
2024	_	_	-	_		_	_	_	-	-	_	-
2025	-	-	-	-	-	-	-	-	-	-	-	
2020			-	-					-		-	
2027					-	-	-			-		-
2020	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
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2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
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2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-

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Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2023	_	-	-	-	_	_	-	-	_	_	_	_
2025	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69
2026	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77
2027	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84
2028	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2029	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2030	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
2031	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
2032	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
2033	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34
2033	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34
2035	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52
2036	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
2037	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71
2038	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
2039	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
2040	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
2041	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11
2042	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21
2042	5.32		5.32	5.32					5.32			
		5.32			5.32	5.32	5.32	5.32		5.32	5.32	5.32
2044	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41
2045	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55
2046	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65
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## PGE UM 1728

## Application to Update Schedule 201 Avoided Cost Power Purchase Information

Attachment B Description of Renewable Avoided Costs

### PORTLAND GENERAL ELECTRIC COMPANY RENEWABLE AVOIDED COST STUDY 2021 ANNUAL UPDATE

## Introduction

Consistent with Commission Order No. 14-058,<sup>1</sup> annual renewable avoided cost updates allow modifications of four factors:

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

This 2021 Renewable Avoided Cost update will focus on the second factor, and updates included in PGE's acknowledged 2019 IRP update.

Below is a summary of the changes:

### Factor 2: Electricity Market Projections

The forward trading curves are based on market prices for electricity delivered to PGE's system and calculated according to the methodology approved by the OPUC. The forward trading curves adjusted for delivery are used to price avoided costs during a resource sufficiency period. For May 2021 through December 2025, the market prices are based on PGE's forward trading curve from February 26, 2021. For 2026 through 2031, the market prices are based on Aurora prices from the same WECC-wide model as the acknowledged 2019 IRP and 2019 IRP Update consistent with the forecast for the standard avoided costs.

Wheeling costs, as included in PGE's Schedule 201 prices, remain based on current BPA rates adjusted for inflation.

### Factor 3: Production Tax Credits

There are no changes since PGE's last avoided cost update in May 2020.

## Factor 4: Other Action

PGE's 2019 IRP Update was acknowledged at the April 20, 2021 OPUC Special Public Meeting. Therefore, PGE also updated ELCC values, the SCCT net energy value, and interconnection costs.

• The updated ELCC values (incremental solar, wind, and SCCT resources) were discussed in Section 5.3 of the IRP Update and provided in tabular format in Appendix D of the IRP Update. The avoided cost calculation for the levelized cost of capacity was updated to account for the SCCT ELCC value, which aligns with

<sup>&</sup>lt;sup>1</sup> In the Matter of Investigation Into Qualifying Facility Contracting and Pricing, Docket No, UM 1610, Order No. 14-058 at 25-26 (Feb. 24, 2014).

the IRP Update Sections 5.3 and 5.4.

- The updated SCCT net energy value was provided in Appendix F of the IRP Update.
- The updated inflation and interest rates for the interconnection costs were discussed in Section 5.1 of the IRP Update and provided in Appendix F.

### Deficiency/Sufficiency Periods

There is no change to the Deficiency/Sufficiency periods as a result of this May 1 Update. The current Deficiency/Sufficiency periods approved by the Commission in Order No. 20-171 are stated below for reference purposes:

- Renewable Resource Sufficiency Period is the period from the current year through 2024.
- Renewable Resource Deficiency Period is the period from 2025.

## Summary of Avoided Cost Estimates

Tables R.1 through R.3 (following) summarize PGE avoided cost prices. Tables R.1a, R.1b, R.2a, R.2b, R.3a, R.3b<sup>2</sup> are estimates of monthly on- and off-peak renewable avoided costs for over twenty years beginning in May 2021. The renewable resource sufficiency period prices (expressed in \$/MWh or mills/kWh) for the years 2021 through 2024 are based on the forward electricity curves adjusted for delivery as discussed above.

Renewable avoided cost prices beginning January 2025 are represented by the fully allocated costs of a renewable wind resource based on PGE's acknowledged 2019 IRP Update<sup>3</sup> with applicable adjustments for capacity value. The energy portion of the on-and off-peak prices are shaped using the on- and off-peak monthly shape factors based on the 2024 market prices. On-peak periods are from 6 a.m. through 10 p.m. Mondays through Saturdays.<sup>4</sup> The off-peak hours are from 10 p.m. until 6 a.m. Mondays through Saturdays and all twenty-four hours on Sunday.<sup>5</sup> Table R.4 provides the wind integration costs. Tables R.5 and R.6 show the on- and off-peak resource sufficiency rates.

## Avoided Cost Components

## Energy:

Tables R.7, R.8 and R.9 are the basis for energy during the deficiency period.

Table R.8 shows the full value of a wind resource (as flat \$/MWh). Table 7 isolates the value of wind capacity. Tables R.9 shows the full value of a wind resource less wind capacity value (Table 8 less Table 7 equates to Table 9).

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

<sup>&</sup>lt;sup>2</sup>R1: Base Load QF; R2: Wind QF; R3: Solar QF.

<sup>&</sup>lt;sup>3</sup> Acknowledged at the OPUC April 20, 2021 Public Meeting.

<sup>&</sup>lt;sup>4</sup> Schedule 201, Sheet 201-3.

<sup>&</sup>lt;sup>5</sup> Id.

Capacity:

Table R10a and b, R.1a and b, and R.12a and b isolate the capacity portion of avoided cost prices for Base Load, Wind, and Solar QFs (both on- and off-peak).

## **Renewable Energy Tables**

2021         2022       4         2023       4         2024       4         2025       5         2026       5         2027       5         2028       5         2029       5         2029       5         2030       5	an 0.00 46.52 42.88 42.98 53.59 54.68 55.80 56.79 58.11	Feb 0.00 41.43 38.78 38.88 48.47 49.47 50.48 51.27	Mar 0.00 31.23 31.01 31.12 38.80 39.59	Apr 0.00 22.57 26.25 26.36 32.86	On-P May 18.89 18.14 23.59 23.69	Jun 21.19 27.07	<b>Jul</b> 46.77 46.01		Sep 61.20	Oct 37.75	Nominal \$/M Nov 38.26	Wh Dec 50,49	Annual
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2021         2022       4         2023       4         2024       4         2025       5         2026       5         2027       5         2028       5         2029       5         2030       5	0.00 46.52 42.88 42.98 53.59 54.68 55.80 56.79	0.00 41.43 38.78 38.88 48.47 49.47 50.48	0.00 31.23 31.01 31.12 38.80 39.59	0.00 22.57 26.25 26.36 32.86	18.89 18.14 23.59 23.69	21.19 21.04	46.77 46.01	75.47	61.20	37.75			Annual
2022       4         2023       4         2024       4         2025       5         2026       5         2027       5         2028       5         2029       5         2030       5	46.52 42.88 42.98 53.59 54.68 55.80 56.79	41.43 38.78 38.88 48.47 49.47 50.48	31.23 31.01 31.12 38.80 39.59	22.57 26.25 26.36 32.86	18.14 23.59 23.69	21.04	46.01	75.47			38.26	50.49	
2023       4         2024       4         2025       5         2026       5         2027       5         2028       5         2029       5         2030       5	42.88 42.98 53.59 54.68 55.80 56.79	38.78 38.88 48.47 49.47 50.48	31.01 31.12 38.80 39.59	26.25 26.36 32.86	23.59 23.69			60.79					
2024       4         2025       5         2026       5         2027       5         2028       5         2029       5         2030       5	42.98 53.59 54.68 55.80 56.79	38.88 48.47 49.47 50.48	31.12 38.80 39.59	26.36 32.86	23.69	27.07		00.79	52.64	34.11	35.58	43.89	37.8
2025       5         2026       5         2027       5         2028       5         2029       5         2030       5	53.59 54.68 55.80 56.79	48.47 49.47 50.48	31.12 38.80 39.59	32.86			44.74	56.82	45.21	34.14	35.50	42.19	37.3
2026       5         2027       5         2028       5         2029       5         2030       5	54.68 55.80 56.79	49.47 50.48	38.80 39.59			27.17	44.84	56.93	45.32	34.25	35.60	42.30	37.5
2027       5         2028       5         2029       5         2030       5	55.80 56.79	50.48			29.54	33.87	55.91	70.98	56.50	42.70	44.39	52.74	46.7
2027       5         2028       5         2029       5         2030       5	55.80 56.79	50.48		33.53	30.15	34.57	57.06	72.43	57.66	43.58	45.30	53.82	47.7
2028 5 2029 5 2030 5			40.40	34.22	30.76	35.28	58.22	73.91	58.84	44.47	46.23	54.92	48.6
2029 5 2030 5		51.37	41.12	34.83	31.31	35.90	59.25	75.22	59.88	45.26	47.05	55.89	49.5
2030 5		52.57	42.07	35.64	32.04	36.74	60.63	76.97	61.27	46.31	48.14	57.19	50.6
	59.30	53.65	42.94	36.37	32.69	37.49	61.88	78.55	62.53	47.26	49.13	58.36	51.7
2031 6	60.52	54.75	43.81	37.11	33.36	38.26	63.14	80.16	63.81	48.23	50.13	59.56	52.7
	61.59	55.72	44.59	37.77	33.95	38.93	64.26	81.58	64.94	49.08	51.02	60.61	53.7
	63.02	57.01	45.63	38.65	34.74	39.84	65.76	83.48	66.45	50.22	52.21	62.02	54.9
	64.32	58,18	46.56	39.44	35.46	40.66	67.10	85.19	67.81	51.25	53.28	63.30	56.0
	65.63	59.37	47.52	40.25	36.18	41.49	68.48	86.93	69.20	52.30	54.37	64.59	57.2
	66.80	60.42	48.36	40.96	36.82	42.22	69.69	88.47	70.43	53.23	55.33	65.74	58.2
	68.35	61.83	49.48	41.91	37.68	43.21	71.31	90.53	72.07	54.47	56.62	67.27	59.6
	69.75	63.10	50.50	42.77	38.45	44.09	72.77	92.39	73.54	55.58	57.78	68.64	60.8
	71.18	64.39	51.53	43.65	39.24	45.00	74.27	94.28	75.05	56.72	58.96	70.05	62.1
	72.44	65.53	52.44	44.42	39.93	45.79	75.58	95.95	76.38	57.72	60.01	71.29	63.1
	74.13	67.05	53.67	45.46	40.86	46.86	77.34	98.18	78.16	59.07	61.40	72.95	64.6
	75.64	68.43	54.76	46.39	41.70	47.82	78.92	100.19	79.76	60.28	62.66	74.44	65.9
	77.19	69.83	55.89	47.34	42.56	48.80	80.54	102.24	81.39	61.51	63.95	75.97	67.3
	78.56	71.07	56.88	48.17	43.31	49.66	81.97	104.05	82.83	62.60	65.08	77.31	68.5
	80.39	72.72	58.20	49.30	44.32	50.82	83.87	106.48	84.76	64.06	66.59	79.11	70.1
	82.04	74.21	59.39	50.31	45.23	51.86	85.59	108.66	86.50	65.37	67.96	80.73	71.5
	acity Rem												
					Por	tland Gene	eral Electri	с					
						vable Avoid							

Table R.1b										-	Nominal \$/M	Wh	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	0.00	0.00	0.00	0.00	9.97	9.46	25.52	39.28	35.20	30.87	30.87	40.30	
2022	38.37	34.29	28.17	16.97	9.15	11.95	26.61	35.78	34.37	28.26	29.72	34.96	27.34
2023	37.42	32.32	24.65	17.63	12.56	12.92	25.72	34.57	33.21	28.80	30.32	35.73	27.19
2024	37.74	32.61	24.89	17.82	12.73	13.09	25.97	34.87	33.50	29.07	30.60	36.04	27.41
2025	47.06	40.66	31.04	22.22	15.87	16.32	32.38	43.47	41.77	36.24	38.15	44.94	34.14
2026	48.02	41.49	31.67	22.68	16.20	16.65	33.05	44.36	42.62	36.98	38.93	45.86	34.84
2027	49.00	42.34	32.32	23.14	16.53	16.99	33.72	45.27	43.50	37.74	39.73	46.80	35.61
2028	49.87	43.09	32.89	23.55	16.82	17.29	34.32	46.07	44.27	38.41	40.44	47.63	36.29
2029	51.03	44.10	33.66	24.10	17.21	17.69	35.12	47.15	45.30	39.30	41.38	48.73	37.08
2030	52.08	45.00	34.35	24.59	17.57	18.06	35.84	48.11	46.22	40.11	42.22	49.73	37.81
2031	53.14	45.92	35.05	25.10	17.93	18.43	36.57	49.10	47.17	40.93	43.09	50.75	38.56
2032	54.09	46.73	35.67	25.54	18.24	18.75	37.22	49.97	48.01	41.65	43.85	51.65	39.26
2033	55.34	47.82	36.50	26.14	18.67	19.19	38.09	51.13	49.12	42.62	44.87	52.85	40.17
2034	56.48	48.80	37.25	26.67	19.05	19.58	38.87	52.18	50.13	43.50	45.79	53.94	41.08
2035	57.64	49.80	38.02	27.22	19.44	19.98	39.66	53.25	51.16	44.39	46.73	55.04	41.88
2036	58.66	50.68	38.69	27.70	19.79	20.34	40.36	54.19	52.06	45.17	47.56	56.01	42.57
2037	60.02	51.86	39.59	28.34	20.25	20.81	41.30	55.45	53.27	46.22	48.67	57.32	43.55
2038	61.25	52.93	40.40	28.93	20.66	21.24	42.15	56.59	54.37	47.17	49.66	58.49	44.52
2039	62.51	54.01	41.23	29.52	21.08	21.67	43.01	57.75	55.48	48.14	50.68	59.69	45.36
2040	63.61	54.97	41.96	30.04	21.46	22.06	43.77	58.77	56.46	48.99	51.58	60.75	46.32
2041	65.09	56.25	42.93	30.74	21.96	22.57	44.79	60.14	57.78	50.13	52.78	62.16	47.26
2042	66.43	57.40	43.81	31.37	22.41	23.03	45.71	61.37	58.96	51.16	53.86	63.44	48.19
2043	67.79	58.57	44.71	32.01	22.87	23.50	46.65	62.63	60.17	52.20	54.96	64.74	49.18
2044	68.99	59.61	45.50	32.58	23.27	23.92	47.47	63.73	61.23	53.13	55.93	65.88	50.09
2045	70.59	61.00	46.56	33.34	23.81	24.48	48.58	65.22	62.66	54.37	57.24	67.41	51.34
2046	72.04	62.25	47.52	34.02	24.30	24.98	49.57	66.55	63.94	55.48	58.41	68.80	52.35
	Capacity Re	moved, Sh	aping										

					Renew	tland Gene /able Avoic n-Peak Ene	led Cost S						
able R.2a	1						37,			1	Nominal \$/N	IWh	
N/		Feb		•				•	0	0.1	N	0	
Year 2021	Jan 0.00	0.00	Mar 0.00	Apr 0.00	May 19.50	Jun	Jul 46.44	Aug 75.14	Sep	Oct 37.42	Nov 27.02	Dec 50.16	Annual
					18.56	20.85			60.87 52.30		37.93		27.0
2022	46.18	41.09	30.89	22.23	17.81	20.70	45.67	60.46		33.77	35.24	43.55	37.5
2023	42.53	38.43	30.67	25.91	23.24	26.72	44.39	56.48	44.87	33.80	35.15	41.85	37.0
2024	42.63	38.53	30.76	26.00	23.34	26.82	44.49	56.57	44.96	33.90	35.25	41.94	37.1
2025	53.23	48.11	38.44	32.50	29.18	33.51	55.55	70.62	56.14	42.34	44.03	52.38	46.3
2026	54.32	49.10	39.22	33.17	29.78	34.20	56.69	72.06	57.29	43.21	44.93	53.45	47.3
2027	55.43	50.11	40.03	33.85	30.39	34.90	57.85	73.54	58.46	44.09	45.85	54.54	48.2
2028	56.41	50.99	40.73	34.44	30.93	35.52	58.87	74.84	59.50	44.87	46.66	55.51	49.
2029	57.72	52.18	41.68	35.25	31.65	36.35	60.24	76.58	60.88	45.92	47.75	56.80	50.
2030	58.91	53.25	42.54	35.97	32.30	37.09	61.48	78.15	62.13	46.86	48.73	57.97	51.
2031	60.11	54.34	43.41	36.71	32.96	37.85	62.74	79.75	63.40	47.82	49.73	59.15	52.
2032	61.18	55.30	44.18	37.35	33.54	38.52	63.85	81.16	64.52	48.66	50.61	60.20	53.
2033	62.60	56.59	45.21	38.22	34.32	39.42	65.33	83.05	66.03	49.80	51.79	61.60	54.
2034	63.88	57.75	46.13	39.01	35.02	40.22	66.67	84.75	67.38	50.82	52.85	62.86	55.
2035	65.19	58.93	47.08	39.81	35.74	41.05	68.04	86.49	68.76	51.86	53.93	64.15	56.
2036	66.35	59.97	47.91	40.51	36.37	41.77	69.24	88.02	69.98	52.78	54.88	65.29	57.
2037	67.89	61.37	49.02	41.45	37.22	42.75	70.85	90.07	71.61	54.01	56.16	66.81	59.
2038	69.28	62.63	50.03	42.30	37.98	43.62	72.31	91.92	73.07	55.11	57.31	68.18	60.
2039	70.70	63.91	51.05	43.17	38.76	44.52	73.79	93.80	74.57	56.24	58.49	69.57	61.
2040	71.95	65.04	51.96	43.93	39.45	45.30	75.09	95.46	75.89	57.24	59.52	70.80	62.
2041	73.63	66.56	53.17	44.96	40.37	46.36	76.84	97.68	77.66	58.57	60.91	72.45	64.
2042	75.14	67.92	54.26	45.88	41.19	47.31	78.42	99.68	79.25	59.77	62.15	73.94	65.
2043	76.68	69.31	55.37	46.82	42.04	48.28	80.02	101.73	80.87	60.99	63.43	75.45	66.
2044	78.03	70.54	56.35	47.65	42.78	49.13	81.44	103.52	82.30	62.07	64.55	76.78	68.
2045	79.85	72.18	57.66	48.76	43.78	50.28	83.33	105.94	84.22	63.52	66.05	78.57	69.
2046	81.49	73.66	58.84	49.75	44.67	51.31	85.04	108.11	85.94	64.82	67.41	80.18	70.
	Capacity Re												
						tland Gene	ral Electri	c					
						able Avoid							
						f-Peak Ene		uuy					
able R.2b	)						317			Ν	Iominal \$/M	IWh	
Year	Jan	Feb	Mar										
2021						lun	- Iul	Διια	Sen	Oct	Nov	Dec	Annua
	0.00			Apr	May	Jun 9 13	Jul 25.19	Aug	Sep 34.87	Oct 30.54	Nov 30.54	Dec 39.97	Annua
	0.00	0.00	0.00	0.00	9.64	9.13	25.19	38.95	34.87	30.54	30.54	39.97	
2022	38.03	0.00 33.95	0.00 27.84	0.00	9.64 8.81	9.13 11.61	25.19 26.27	38.95 35.44	34.87 34.03	30.54 27.92	30.54 29.38	39.97 34.62	27.0
2022 2023	38.03 37.08	0.00 33.95 31.98	0.00 27.84 24.31	0.00 16.63 17.28	9.64 8.81 12.22	9.13 11.61 12.57	25.19 26.27 25.38	38.95 35.44 34.22	34.87 34.03 32.86	30.54 27.92 28.45	30.54 29.38 29.98	39.97 34.62 35.39	27. 26.
2022 2023 2024	38.03 37.08 37.39	0.00 33.95 31.98 32.26	0.00 27.84 24.31 24.54	0.00 16.63 17.28 17.47	9.64 8.81 12.22 12.38	9.13 11.61 12.57 12.73	25.19 26.27 25.38 25.62	38.95 35.44 34.22 34.52	34.87 34.03 32.86 33.15	30.54 27.92 28.45 28.71	30.54 29.38 29.98 30.25	39.97 34.62 35.39 35.69	27. 26. 27.
2022 2023 2024 2025	38.03 37.08 37.39 46.70	0.00 33.95 31.98 32.26 40.30	0.00 27.84 24.31 24.54 30.68	0.00 16.63 17.28 17.47 21.86	9.64 8.81 12.22 12.38 15.51	9.13 11.61 12.57 12.73 15.96	25.19 26.27 25.38 25.62 32.02	38.95 35.44 34.22 34.52 43.11	34.87 34.03 32.86 33.15 41.41	30.54 27.92 28.45 28.71 35.88	30.54 29.38 29.98 30.25 37.79	39.97 34.62 35.39 35.69 44.58	27. 26. 27. 33.
2022 2023 2024 2025 2026	38.03 37.08 37.39 46.70 47.65	0.00 33.95 31.98 32.26 40.30 41.13	0.00 27.84 24.31 24.54 30.68 31.31	0.00 16.63 17.28 17.47 21.86 22.31	9.64 8.81 12.22 12.38 15.51 15.83	9.13 11.61 12.57 12.73 15.96 16.28	25.19 26.27 25.38 25.62 32.02 32.68	38.95 35.44 34.22 34.52 43.11 44.00	34.87 34.03 32.86 33.15 41.41 42.25	30.54 27.92 28.45 28.71 35.88 36.61	30.54 29.38 29.98 30.25 37.79 38.57	39.97 34.62 35.39 35.69 44.58 45.49	27.0 26.0 27.0 33.0 34.4
2022 2023 2024 2025 2026 2027	38.03 37.08 37.39 46.70 47.65 48.63	0.00 33.95 31.98 32.26 40.30 41.13 41.97	0.00 27.84 24.31 24.54 30.68 31.31 31.95	0.00 16.63 17.28 17.47 21.86 22.31 22.77	9.64 8.81 12.22 12.38 15.51 15.83 16.15	9.13 11.61 12.57 12.73 15.96 16.28 16.62	25.19 26.27 25.38 25.62 32.02 32.68 33.35	38.95 35.44 34.22 34.52 43.11 44.00 44.90	34.87 34.03 32.86 33.15 41.41 42.25 43.12	30.54 27.92 28.45 28.71 35.88 36.61 37.36	30.54 29.38 29.98 30.25 37.79 38.57 39.36	39.97 34.62 35.39 35.69 44.58 45.49 46.42	27.0 26.0 27.0 33.0 34.0 35.0
2022 2023 2024 2025 2026 2027 2028	38.03 37.08 37.39 46.70 47.65 48.63 49.49	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94	38.95 35.44 34.22 34.52 43.11 44.00 44.90 45.69	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02	30.54 29.38 30.25 37.79 38.57 39.36 40.05	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24	27. 26. 27. 33. 34. 35. 35.
2022 2023 2024 2025 2026 2027 2028 2029	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73	38.95 35.44 34.22 34.52 43.11 44.00 44.90 45.69 46.76	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34	27. 26. 27. 33. 34. 35. 35. 35.
2022 2023 2024 2025 2026 2027 2028 2029 2030	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44	38.95 35.44 34.22 34.52 43.11 44.00 44.90 45.69 46.76 47.71	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33	27. 26. 27. 33. 34. 35. 35. 36. 37.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17	38.95 35.44 34.22 34.52 43.11 44.00 44.90 45.69 46.76 47.71 48.69	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35	27. 26. 27. 33. 34. 35. 36. 37. 38.
2022 2023 2024 2025 2026 2027 2028 2029 2030	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44	38.95 35.44 34.22 34.52 43.11 44.00 44.90 45.69 46.76 47.71	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33	27. 26. 27. 33. 34. 35. 36. 37. 38.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 43.71 44.60 45.52 46.32 47.40	0.00 27.84 24.31 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24	9.13 11.61 12.57 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66	38.95 35.44 34.22 34.52 43.11 44.00 44.90 45.69 46.76 47.71 48.69 49.55 50.71	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43	27. 26. 27. 33. 34. 35. 36. 37. 38. 38. 39.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2033	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 47.40 48.37	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 35.26 36.08 36.82	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50	27. 26. 27. 33. 34. 35. 35. 36. 37. 38. 38. 38. 39. 40.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 47.40 48.37 49.36	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08 36.82 37.57	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.71 24.20 24.69 25.13 25.71 26.24 26.78	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60	27. 26. 27. 33. 34. 35. 36. 37. 38. 38. 38. 39. 40. 41.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2033	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 47.40 48.37	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 35.26 36.08 36.82	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50	27. 26. 27. 33. 34. 35. 36. 37. 38. 38. 38. 39. 40. 41.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 47.40 48.37 49.36	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08 36.82 37.57	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.71 24.20 24.69 25.13 25.71 26.24 26.78	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06 43.95	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60	27. 26. 27. 33. 34. 35. 36. 37. 38. 38. 39. 40. 41.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 46.32 46.32 46.32 46.32 50.23	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08 36.08 36.82 37.57 38.24	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24 26.78 27.25	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00 19.34	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.89	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91	38.95 35.44 34.22 34.52 43.11 44.00 44.90 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72 51.61	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06 43.95 44.72	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 47.11	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60 55.56	27. 26. 27. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 47.40 48.37 49.36 50.23 51.40	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08 36.82 37.57 38.24 39.13	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24 26.24 26.78 27.25 27.89	9.64 8.81 12.22 12.38 15.51 16.43 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00 19.34 19.79	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.89 20.35	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 54.99	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72 51.61 52.81	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 42.20 43.06 43.95 44.72 45.76	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 47.11 48.21	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86	27. 26. 27. 33. 34. 35. 35. 36. 37. 38. 38. 39. 40. 41. 42. 43.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2034 2035 2036 2037	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56 60.78	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 43.71 44.60 45.52 46.32 47.40 48.37 49.36 50.23 51.40 52.46	0.00 27.84 24.31 30.68 31.31 31.95 32.51 33.95 34.65 35.26 36.08 36.82 37.57 38.24 39.13 39.93	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24 26.78 27.25 27.89 28.46	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00 19.34 19.79 20.19	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.54 19.89 20.35 20.77	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84 41.68	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 53.74 54.99 56.12	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72 51.61 52.81 53.90	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06 43.95 43.95 43.95 43.76 45.76 46.70	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 46.29 47.11 48.21 49.19	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86 58.02	27. 26. 27. 33. 34. 35. 36. 37. 38. 38. 39. 40. 41. 42. 43. 44.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2038 2039 2040	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56 60.78 62.03 63.12	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 47.40 48.37 49.36 50.23 51.40 52.46 53.53 54.48	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08 36.82 37.57 38.24 39.13 39.93 40.75 41.47	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24 26.78 27.25 27.89 28.46 29.04 29.55	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00 19.34 19.79 20.19 20.61 20.97	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.89 20.35 20.77 21.19 21.57	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84 41.68 42.54 43.29	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 53.74 54.99 56.12 57.27 58.28	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72 51.61 52.81 53.90 55.00 55.97	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06 43.95 44.72 45.76 46.70 47.66 48.50	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 47.11 48.21 49.19 50.20 51.09	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86 58.02 59.21 60.26	27. 26. 27. 33. 35. 35. 36. 37. 38. 38. 39. 40. 41. 42. 43. 44. 44.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2039 2039 2039 2039	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56 60.78 62.03 63.12 64.59	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 47.40 48.37 49.36 50.23 51.40 52.46 53.53 54.48 55.75	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08 36.82 37.57 38.24 39.13 39.93 40.75 41.47	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 24.69 25.13 25.71 26.24 26.78 27.25 27.89 28.46 29.04 29.55 30.24	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00 19.34 19.79 20.61 20.97 21.46	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.89 20.35 20.77 21.19 21.57 22.07	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84 41.68 42.54 43.29 44.30	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 54.99 56.12 57.27 58.28 59.64	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 49.70 50.72 51.61 52.81 53.90 55.97 57.28	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06 43.95 44.72 45.76 46.70 47.66 48.50 49.63	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 43.44 43.44 44.45 45.36 46.29 47.11 48.21 49.19 50.20 51.09 52.28	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86 56.86 56.802 59.21 60.26 61.66	27. 26. 27. 33. 35. 35. 36. 37. 38. 38. 39. 40. 41. 42. 43. 44. 44. 45. 46.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2033 2033 2034 2035 2036 2037 2038 2039 2039 2039 2040 2041 2042	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56 60.78 62.03 63.12 64.59 65.92	0.00 33.95 31.98 32.26 40.30 41.13 41.97 42.71 43.71 44.60 45.52 46.32 47.40 48.37 49.36 50.23 51.40 52.46 53.53 54.48 55.75 56.89	0.00 27.84 24.31 24.54 30.68 31.31 31.95 32.51 33.27 33.95 34.65 35.26 36.08 36.82 37.57 38.24 39.13 39.93 40.75 41.47 42.44 43.31	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.71 24.20 24.69 25.13 25.71 26.24 26.78 27.25 27.89 28.46 29.04 29.04 29.04 29.55 30.24 30.86	9.64 8.81 12.22 12.38 15.51 15.83 16.15 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00 19.34 19.79 20.61 20.97 21.46 21.90	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.89 20.35 20.77 21.19 21.57 22.07 22.52	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84 41.68 42.54 43.29 44.30	38.95 35.44 34.22 34.52 43.11 43.00 44.90 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 54.99 56.12 57.27 58.28 59.64 60.86	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72 51.61 52.81 53.90 55.00 55.00 55.97 57.28 58.45	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06 43.95 44.72 45.76 46.70 47.66 48.50 49.63 50.65	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 47.11 48.21 49.19 50.20 51.09 52.28 53.35	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86 56.862 59.21 60.26 61.66 62.93	27. 26. 27. 33. 35. 35. 36. 37. 38. 38. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56 60.78 62.03 63.12 64.59 65.92 67.27	$\begin{array}{c} 0.00\\ 33.95\\ 31.98\\ 32.26\\ 40.30\\ 41.13\\ 41.97\\ 42.71\\ 43.71\\ 43.71\\ 44.60\\ 45.52\\ 46.32\\ 47.40\\ 48.37\\ 49.36\\ 50.23\\ 51.40\\ 52.46\\ 53.53\\ 54.48\\ 55.75\\ 56.89\\ 58.06\end{array}$	0.00 27.84 24.31 30.68 31.31 31.95 32.51 33.95 34.65 35.26 36.08 36.82 37.57 38.24 39.93 40.75 41.47 42.44 43.31	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24 26.78 27.25 27.89 28.46 29.04 29.55 30.24 30.24 30.86 31.49	9.64 8.81 12.22 12.38 15.51 16.15 16.44 16.82 17.17 17.52 17.83 18.24 19.00 19.34 19.79 20.19 20.61 20.97 21.46 21.90 22.35	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.54 19.89 20.35 20.77 21.19 21.57 22.07 22.52 22.99	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84 41.68 42.54 43.29 44.30 45.20 46.13	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 53.74 54.99 56.12 57.27 58.28 59.64 60.86 62.11	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 49.70 50.72 51.61 52.81 53.90 55.00 55.97 57.28 58.45 59.65	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 40.52 41.24 42.20 43.06 43.95 44.72 45.76 46.70 47.66 48.50 49.63 50.65 51.69	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 47.11 48.21 49.19 50.20 51.09 52.28 53.35 54.44	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86 58.02 59.21 60.26 61.66 61.66 62.93 64.22	27. 26. 27. 33. 34. 35. 35. 36. 38. 38. 39. 40. 41. 42. 43. 44. 44. 44. 44. 44. 44. 44. 45. 46. 77. 48.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56 60.78 62.03 63.12 64.59 65.92 67.27 68.46	$\begin{array}{c} 0.00\\ 33.95\\ 31.98\\ 32.26\\ 40.30\\ 41.13\\ 41.97\\ 42.71\\ 43.71\\ 43.71\\ 44.60\\ 45.52\\ 46.32\\ 47.40\\ 48.37\\ 49.36\\ 50.23\\ 51.40\\ 52.46\\ 53.53\\ 51.40\\ 52.46\\ 53.53\\ 54.48\\ 55.75\\ 56.89\\ 58.06\\ 59.08\\ \end{array}$	0.00 27.84 24.31 30.68 31.31 31.95 32.51 33.25 34.65 35.26 36.08 36.82 37.57 38.24 39.13 39.93 40.75 41.47 42.44 43.31 44.19 44.97	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24 26.78 27.25 27.89 28.46 29.04 29.55 30.24 30.86 31.49 32.05	9.64 8.81 12.22 12.38 15.51 16.44 16.82 17.17 17.52 17.83 18.24 18.62 19.00 19.34 19.79 20.61 20.97 21.46 21.90 22.35 22.74	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.89 20.35 20.77 21.19 21.57 22.07 22.52 22.99 23.39	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84 41.68 42.54 43.29 44.30 45.20 46.13 46.94	38.95 35.44 34.22 34.52 34.51 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 53.74 54.99 56.12 57.27 58.28 59.64 60.86 62.11 63.21	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 50.72 51.61 52.81 53.90 55.00 55.97 57.28 58.45 59.65 60.70	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 39.71 40.52 41.24 42.20 43.06 43.95 44.72 45.76 46.70 47.66 48.50 49.63 50.65 51.69 52.60	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 46.29 46.29 50.20 51.09 50.20 51.09 52.28 53.35 54.44 55.41	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 48.34 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86 56.86 56.82 59.21 60.26 61.66 62.93 64.22 65.35	27. 26. 27. 33. 35. 35. 36. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 44. 44. 44. 44. 44. 45. 54. 43. 44. 44. 44. 47. 48. 49.
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043	38.03 37.08 37.39 46.70 47.65 48.63 49.49 50.64 51.68 52.74 53.67 54.92 56.05 57.19 58.21 59.56 60.78 62.03 63.12 64.59 65.92 67.27	$\begin{array}{c} 0.00\\ 33.95\\ 31.98\\ 32.26\\ 40.30\\ 41.13\\ 41.97\\ 42.71\\ 43.71\\ 43.71\\ 44.60\\ 45.52\\ 46.32\\ 47.40\\ 48.37\\ 49.36\\ 50.23\\ 51.40\\ 52.46\\ 53.53\\ 54.48\\ 55.75\\ 56.89\\ 58.06\end{array}$	0.00 27.84 24.31 30.68 31.31 31.95 32.51 33.95 34.65 35.26 36.08 36.82 37.57 38.24 39.93 40.75 41.47 42.44 43.31	0.00 16.63 17.28 17.47 21.86 22.31 22.77 23.17 23.71 24.20 24.69 25.13 25.71 26.24 26.78 27.25 27.89 28.46 29.04 29.55 30.24 30.24 30.86 31.49	9.64 8.81 12.22 12.38 15.51 16.15 16.44 16.82 17.17 17.52 17.83 18.24 19.00 19.34 19.79 20.19 20.61 20.97 21.46 21.90 22.35	9.13 11.61 12.57 12.73 15.96 16.28 16.62 16.91 17.30 17.66 18.02 18.34 18.77 19.15 19.54 19.54 19.89 20.35 20.77 21.19 21.57 22.07 22.52 22.99	25.19 26.27 25.38 25.62 32.02 32.68 33.35 33.94 34.73 35.44 36.17 36.80 37.66 38.43 39.22 39.91 40.84 41.68 42.54 43.29 44.30 45.20 46.13	38.95 35.44 34.22 34.52 43.11 44.00 45.69 46.76 47.71 48.69 49.55 50.71 51.75 52.81 53.74 53.74 54.99 56.12 57.27 58.28 59.64 60.86 62.11	34.87 34.03 32.86 33.15 41.41 42.25 43.12 43.88 44.91 45.83 46.76 47.59 48.70 49.70 49.70 50.72 51.61 52.81 53.90 55.00 55.97 57.28 58.45 59.65	30.54 27.92 28.45 28.71 35.88 36.61 37.36 38.02 38.91 40.52 41.24 42.20 43.06 43.95 44.72 45.76 46.70 47.66 48.50 49.63 50.65 51.69	30.54 29.38 29.98 30.25 37.79 38.57 39.36 40.05 40.99 41.83 42.68 43.44 44.45 45.36 46.29 47.11 48.21 49.19 50.20 51.09 52.28 53.35 54.44	39.97 34.62 35.39 35.69 44.58 45.49 46.42 47.24 49.33 50.35 51.24 52.43 53.50 54.60 55.56 56.86 58.02 59.21 60.26 61.66 61.66 62.93 64.22	

							General El Avoided Co		R				
							k Energy, S						
	Wh	Nominal \$/M										a	able R.3a
Annu	Dec	Nov	Oct	Sep	Aug	Jul	Jun	May	Apr	Mar	Feb	Jan	Year
Annu	49.11	36.88	36.37	59.81	74.09	45.39	19.80	17.51	0.00	0.00	0.00	0.00	2021
36	49.11	34.16	30.37	51.23	59.38	45.55	19.60	16.73	21.16	29.82	40.01	45.11	2021
35	40.75	34.06	32.70	43.77	55.38	43.30	25.63	22.15	24.81	29.57	37.34	41.44	2023
36	40.83	34.13	32.78	43.85	55.46	43.37	25.70	22.22	24.89	29.65	37.41	41.51	2024
45	51.24	42.89	41.20	55.00	69.48	54.41	32.37	28.04	31.36	37.30	46.97	52.09	2025
46	52.29	43.77	42.04	56.13	70.90	55.52	33.04	28.62	32.00	38.06	47.94	53.15	2026
47	53.36	44.67	42.91	57.28	72.35	56.66	33.71	29.20	32.66	38.84	48.92	54.24	2027
47	54.30	45.45	43.66	58.29	73.63	57.66	34.31	29.71	33.23	39.52	49.78	55.20	2028
49	55.57	46.51	44.68	59.65	75.35	59.01	35.11	30.41	34.01	40.45	50.94	56.49	2029
50	56.70	47.47	45.60	60.87	76.89	60.22	35.83	31.03	34.71	41.28	51.99	57.64	2030
51	57.87	48.44	46.53	62.12	78.46	61.45	36.56	31.67	35.42	42.12	53.05	58.83	2031
51	58.88	49.29	47.35	63.21	79.85	62.53	37.21	32.23	36.04	42.86	53.99	59.86	2032
53	60.26	50.44	48.46	64.69	81.71	63.99	38.08	32.98	36.88	43.86	55.25	61.26	2033
54	61.50	51.48	49.45	66.01	83.39	65.30	38.86	33.66	37.64	44.76	56.38	62.52	2033
55	62.76	52.53	50.46	67.36	85.09	66.64	39.65	34.35	38.41	45.68	57.54	63.80	2035
56	63.86	53.46	51.35	68.55	86.60	67.82	40.35	34.95	39.08	46.48	58.55	64.92	2036
57	65.35	54.71	52.55	70.15	88.62	69.40	41.29	35.77	40.00	47.57	59.92	66.44	2037
58	66.69	55.83	53.63	71.59	90.43	70.82	42.14	36.50	40.82	48.55	61.14	67.80	2038
60	68.06	56.97	54.73	73.06	92.29	72.27	43.00	37.25	41.66	49.54	62.40	69.19	2039
61	69.26	57.97	55.69	74.34	93.91	73.55	43.76	37.90	42.39	50.41	63.50	70.41	2040
62	70.87	59.33	56.99	76.08	96.11	75.26	44.78	38.79	43.38	51.59	64.98	72.05	2041
63	72.33	60.54	58.16	77.64	98.07	76.81	45.70	39.58	44.27	52.65	66.31	73.53	2042
65	73.81	61.79	59.35	79.23	100.08	78.38	46.64	40.40	45.18	53.73	67.67	75.03	2043
66	75.11	62.87	60.40	80.63	101.85	79.76	47.46	41.10	45.97	54.67	68.86	76.36	2043
67	76.86	64.34	61.81	82.51	104.23	81.62	48.57	42.07	47.05	55.95	70.47	78.14	2045
69	78.44	65.66	63.08	84.20	106.36	83.30	49.56	42.93	48.01	57.10	71.91	79.74	2046
								oved	ration Rem	aping, Integ	noved, Sh	Capacity Ren	
						ectric	General El		ration Rem	aping, Integ	noved, Sh	Capacity Rer	
				ļ				Portland		aping, Integ	noved, Sh	Capacity Rer	
				ļ		st Study	Avoided Co	Portland enewable		aping, Integ	noved, Sh	Capacity Rer	
	Wh	Nominal \$/M				st Study		Portland enewable		aping, Integ	noved, Sh		able R.3I
Δηριμ				San	Aug	ost Study olar	Avoided Co k Energy, S	Portland enewable Off-Pea	R			b	
Annua	Dec	Nov	Oct	Sep 33.82	Aug 37.90	olar Jul	Avoided Co k Energy, S Jun	Portland enewable Off-Pea May	Apr	Mar	Feb	b Jan	Year
	Dec 38.92	Nov 29.49	Oct 29.49	33.82	37.90	olar Jul 24.14	Avoided Co k Energy, S Jun 8.08	Portland enewable Off-Pea May 8.59	Apr 0.00	Mar 0.00	Feb 0.00	b Jan 0.00	Year 2021
25	Dec 38.92 33.55	Nov 29.49 28.31	Oct 29.49 26.85	33.82 32.95	37.90 34.37	olar Jul 24.14 25.20	Avoided Co k Energy, S Jun 8.08 10.53	Portland enewable Off-Pea May 8.59 7.74	Apr 0.00 15.56	Mar 0.00 26.76	Feb 0.00 32.88	b Jan 0.00 36.96	Year 2021 2022
25 25	Dec 38.92 33.55 34.29	Nov 29.49 28.31 28.88	Oct 29.49 26.85 27.36	33.82 32.95 31.76	37.90 34.37 33.13	Jul         24.14         25.20         24.28	Avoided Co k Energy, S Jun 8.08 10.53 11.48	Portland enewable Off-Pea May 8.59 7.74 11.12	Apr 0.00 15.56 16.19	Mar 0.00 26.76 23.21	Feb 0.00 32.88 30.88	b Jan 0.00 36.96 35.98	Year 2021 2022 2023
25 25 25	Dec 38.92 33.55 34.29 34.57	Nov 29.49 28.31 28.88 29.13	Oct 29.49 26.85 27.36 27.60	33.82 32.95 31.76 32.03	37.90 34.37 33.13 33.40	st Study olar Jul 24.14 25.20 24.28 24.50	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26	Apr 0.00 15.56 16.19 16.35	Mar 0.00 26.76 23.21 23.42	Feb 0.00 32.88 30.88 31.14	b Jan 0.00 36.96 35.98 36.27	Year 2021 2022 2023 2024
25 25 25 32	Dec 38.92 33.55 34.29 34.57 43.44	Nov 29.49 28.31 28.88 29.13 36.65	Oct 29.49 26.85 27.36 27.60 34.74	33.82 32.95 31.76 32.03 40.27	37.90 34.37 33.13 33.40 41.97	set Study olar Jul 24.14 25.20 24.28 24.50 30.88	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37	Apr 0.00 15.56 16.19 16.35 20.72	Mar 0.00 26.76 23.21 23.42 29.54	Feb 0.00 32.88 30.88 31.14 39.16	b Jan 0.00 36.96 35.98 36.27 45.56	Year 2021 2022 2023 2024 2025
25 25 25 32 33	Dec 38.92 33.55 34.29 34.57 43.44 44.33	Nov 29.49 28.31 28.88 29.13 36.65 37.40	Oct 29.49 26.85 27.36 27.60 34.74 35.45	33.82 32.95 31.76 32.03 40.27 41.09	37.90 34.37 33.13 33.40 41.97 42.83	st Study olar Jul 24.14 25.20 24.28 24.50 30.88 31.51	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67	Apr 0.00 15.56 16.19 16.35 20.72 21.15	Mar 0.00 26.76 23.21 23.42 29.54 30.14	Feb 0.00 32.88 30.88 31.14 39.16 39.96	b 0.00 36.96 35.98 36.27 45.56 46.49	Year 2021 2022 2023 2024 2025 2026
25 25 25 32	Dec 38.92 33.55 34.29 34.57 43.44	Nov 29.49 28.31 28.88 29.13 36.65	Oct 29.49 26.85 27.36 27.60 34.74	33.82 32.95 31.76 32.03 40.27	37.90 34.37 33.13 33.40 41.97	set Study olar Jul 24.14 25.20 24.28 24.50 30.88	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37	Apr 0.00 15.56 16.19 16.35 20.72	Mar 0.00 26.76 23.21 23.42 29.54	Feb 0.00 32.88 30.88 31.14 39.16	b Jan 0.00 36.96 35.98 36.27 45.56	Year 2021 2022 2023 2024 2025
25 25 25 32 33	Dec 38.92 33.55 34.29 34.57 43.44 44.33	Nov 29.49 28.31 28.88 29.13 36.65 37.40	Oct 29.49 26.85 27.36 27.60 34.74 35.45	33.82 32.95 31.76 32.03 40.27 41.09	37.90 34.37 33.13 33.40 41.97 42.83	st Study olar Jul 24.14 25.20 24.28 24.50 30.88 31.51	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67	Apr 0.00 15.56 16.19 16.35 20.72 21.15	Mar 0.00 26.76 23.21 23.42 29.54 30.14	Feb 0.00 32.88 30.88 31.14 39.16 39.96	b 0.00 36.96 35.98 36.27 45.56 46.49	Year 2021 2022 2023 2024 2025 2026
25 25 32 33 34 34	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84	Oct 29.49 26.85 27.36 27.60 34.74 35.45 36.18	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.12 15.43 15.70	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.58 21.96	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30	Feb 0.00 32.88 30.88 31.14 39.16 39.96 40.78 41.50	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28	Year 2021 2022 2023 2024 2025 2026 2027
25 25 32 33 34 34 35	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75	Oct 29.49 26.85 27.36 27.60 34.74 35.45 36.18 36.81 37.67	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03	Feb 0.00 32.88 30.88 31.14 39.16 39.96 40.78 41.50 42.47	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029
25 25 32 33 34 34 35 36	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56	Oct 29.49 26.85 27.36 27.60 34.74 35.45 36.18 36.81 37.67 38.45	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69	Feb 0.00 32.88 30.88 31.14 39.16 39.96 40.78 41.50 42.47 43.34	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
25 25 32 33 34 34 35 36 36	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40	Oct 29.49 26.85 27.60 34.74 35.45 36.18 36.81 37.67 38.45 39.23	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40	Jul         24.14         25.20         24.50         30.88         31.51         32.16         32.73         33.49         34.18         34.88	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36	Feb 0.00 32.88 30.88 31.14 39.16 39.96 40.78 41.50 42.47 43.34 44.23	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031
25 25 25 32 33 34 34 35 36 36 36 37	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12	Oct 29.49 26.85 27.36 27.60 34.74 35.45 36.81 37.67 38.45 39.23 39.92	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48 46.28	37.90 34.37 33.13 33.40 41.97 42.83 43.71 43.71 43.71 44.48 45.52 46.45 47.40 48.24	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18         34.88         35.49	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94	Feb 0.00 32.88 30.88 31.14 39.16 39.96 40.78 41.50 42.47 43.34 44.23 45.01	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032
25 25 32 33 34 34 35 36 36 37 38	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 49.06 49.92 51.09	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11	Oct 29,49 26,85 27,36 34,74 35,45 36,18 36,81 37,67 38,67 39,23 39,92 40,08	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 43.67 44.56 45.48 46.28 47.36	37.90 34.37 33.13 33.40 41.97 42.83 43.71 43.71 43.71 44.48 45.52 46.45 47.40 48.24 49.37	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.88         35.49         36.32	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.51 16.23 16.51 16.90	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 33.94 34.74	Feb         0.00         32.88         30.88         31.14         39.16         39.96         40.78         41.50         42.47         43.34         44.23         45.01         46.06	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033
25 25 32 33 34 34 35 36 36 36 37 38 39	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99	Oct 29,49 26,85 27,36 27,60 34,74 35,45 36,18 36,81 37,67 38,45 39,92 40,86 41,70	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48 46.28 47.36 48.33	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18         34.54         35.49         36.32         37.07	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.90 17.25	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45	Feb 0.00 32.88 30.88 31.14 39.96 40.78 41.50 42.47 43.34 44.23 45.01 46.06 47.00	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 53.58	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034
25 25 25 32 33 34 34 35 36 36 36 37 38 39 40	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 33.75 40.56 41.40 42.12 43.11 43.99 44.89	Oct 29.49 26.86 27.60 34.74 35.45 36.81 37.67 38.45 39.23 39.92 39.92 41.70 42.55	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48 46.28 47.36 48.33 49.32	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18         35.49         36.32         37.07         37.82	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.90 17.25 17.60	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 24.87 25.38	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.18	Feb 0.00 32.88 30.88 31.14 39.96 40.78 41.50 42.47 43.34 44.23 45.01 46.06 47.00 47.97	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2033 2034 2035
25 25 25 32 33 34 34 35 36 36 36 37 38 39 40 40	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.19 52.10 54.14	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89	Oct 29.49 26.86 27.36 27.60 34.74 35.45 36.18 36.18 37.67 38.45 39.23 39.92 40.86 40.86 40.86 42.55 43.30	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 43.67 44.56 45.48 46.28 47.36 48.33 49.32 50.19	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18         34.88         35.49         36.32         37.07         37.82         38.49	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15 18.46	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.23 16.51 16.90 17.25 17.60 17.91	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.83	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.18 36.81	Feb 0.00 32.88 30.88 31.14 39.16 39.96 40.78 41.50 42.47 43.34 44.23 45.01 46.06 47.90 47.90 48.81	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2033 2034 2035 2036
25 25 25 32 33 34 34 35 36 36 36 37 38 39 40	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 33.75 40.56 41.40 42.12 43.11 43.99 44.89	Oct 29.49 26.86 27.60 34.74 35.45 36.81 37.67 38.45 39.23 39.92 39.92 41.70 42.55	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48 46.28 47.36 48.33 49.32	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18         35.49         36.32         37.07         37.82	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.90 17.25 17.60	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 24.87 25.38	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.18	Feb 0.00 32.88 30.88 31.14 39.96 40.78 41.50 42.47 43.34 44.23 45.01 46.06 47.00 47.97	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2033 2034
25 25 25 32 33 34 34 35 36 36 36 37 38 39 40 40	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.19 52.10 54.14	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89	Oct 29.49 26.86 27.36 27.60 34.74 35.45 36.18 36.18 37.67 38.45 39.23 39.92 40.86 40.86 40.86 42.55 43.30	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 43.67 44.56 45.48 46.28 47.36 48.33 49.32 50.19	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18         34.88         35.49         36.32         37.07         37.82         38.49	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15 18.46	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.23 16.51 16.90 17.25 17.60 17.91	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.83	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.18 36.81	Feb 0.00 32.88 30.88 31.14 39.16 39.96 40.78 41.50 42.47 43.34 44.23 45.01 46.06 47.90 47.90 48.81	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036
25 25 25 32 33 34 35 36 36 36 37 38 39 40 40 40	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20 53.14 55.41	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89 44.89 45.68 46.75	Oct 29,49 26,86 27,360 34,74 35,45 36,18 36,81 37,67 38,45 39,23 39,92 40,86 41,70 41,205 43,30 44,31	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48 46.28 47.36 48.33 49.32 50.19 51.36	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31 53.54	Jul         24.14         25.20         24.28         24.28         24.50         30.88         31.51         32.73         33.49         34.18         35.49         36.32         37.07         37.82         38.49         39.39	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.40 16.73 17.02 17.43 17.78 18.15 18.46 18.90	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.90 17.25 17.60 17.91 18.33	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.38 25.83 26.43	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.18 36.81 37.68	Feb         0.00         32.88         30.88         31.14         39.96         40.78         41.50         42.47         43.34         44.23         45.01         46.06         47.00         47.97         48.81         49.95	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78 58.11	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2035 2036 2037
25 25 25 32 33 34 34 35 36 36 36 37 38 39 40 40 40 40 41 42 43	Dec 38.92 33.55 34.57 43.44 44.33 45.24 45.24 45.24 45.24 49.06 49.92 52.14 53.20 52.14 53.20 54.14 55.41 55.41 55.70	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89 45.68 46.75 47.71 48.69	Oct 29.49 26.85 27.36 27.60 34.74 35.45 36.81 37.67 38.45 39.23 39.92 40.86 41.70 42.55 43.30 44.31 45.22 46.14	$\begin{array}{r} 33.82\\ 32.95\\ 31.76\\ 32.03\\ 40.27\\ 41.09\\ 41.93\\ 42.67\\ 43.67\\ 44.56\\ 45.48\\ 46.28\\ 47.36\\ 48.33\\ 49.32\\ 50.19\\ 51.36\\ 52.41\\ 53.49\\ \end{array}$	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 53.54 53.54 53.54 55.75	st Study olar Jul 24.14 25.20 24.28 24.50 30.88 31.51 32.16 32.73 33.49 34.18 34.88 34.88 35.49 36.32 37.07 37.82 38.49 39.39 40.20 41.02	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.12 15.13 15.70 16.07 16.40 16.73 17.70 16.73 17.70 17.43 17.78 18.15 18.46 18.90 19.29 19.68	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.23 16.51 16.90 17.25 17.60 17.91 18.33 18.71 19.09	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.83 26.43 26.43 26.97 27.53	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.81 37.68 38.45 39.24	Feb         0.00         32.88         30.88         31.14         39.96         40.78         41.50         42.47         43.34         44.23         45.01         46.06         47.00         47.97         48.81         49.95         50.97         52.02	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78 58.11 59.30 60.51	Year 2021 2022 2023 2024 2025 2026 2027 2028 2028 2029 2030 2031 2032 2033 2033 2034 2035 2036 2037 2038 2039
25 25 32 34 34 35 36 37 38 39 40 40 41 42 43 44	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20 54.14 55.54 55.74	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89 45.68 46.75 47.71 48.69 49.54	Oct 29.49 26.86 27.60 34.74 35.45 36.81 37.67 38.45 39.23 39.92 49.23 39.92 43.92 43.30 44.31 44.51 44.51 46.14 46.96	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48 46.28 47.36 48.33 49.32 50.19 51.36 52.41 53.49 54.43	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 46.45 46.45 47.40 48.24 49.37 50.38 51.41 52.31 53.54 54.63 55.75 56.74	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         34.18         34.88         35.49         36.32         37.07         37.82         38.49         39.39         40.20         41.02         41.74	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15 18.46 18.90 19.29 19.68 20.02	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.90 17.25 17.60 17.91 18.33 18.71 19.09 19.42	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.83 26.43 26.97 27.53 28.01	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.18 36.81 37.68 38.45 39.24 39.92	Feb         0.00         32.88         30.88         31.14         39.96         40.78         41.50         42.47         43.34         45.01         46.06         47.00         47.97         48.81         49.95         50.97         52.02         52.93	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78 58.11 59.30 60.51 61.58	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2033 2034 2035 2036 2037 2038 2039 2040
25 25 32 33 34 35 36 36 36 37 38 39 40 40 41 42 43 44 45	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20 54.14 55.41 55.54 57.70 58.71 60.09	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89 45.68 46.75 47.71 48.69 49.54 50.70	Oct 29.49 26.86 27.60 34.74 35.45 36.18 36.81 37.67 38.45 39.23 39.92 40.86 41.80 41.80 42.55 43.30 44.31 45.21 45.22 45.22 46.96 48.05	$\begin{array}{r} 33.82\\ 32.95\\ 31.76\\ 32.03\\ 40.27\\ 41.09\\ 41.93\\ 42.67\\ 43.67\\ 43.67\\ 44.56\\ 45.48\\ 46.28\\ 47.36\\ 48.33\\ 49.32\\ 50.19\\ 51.36\\ 52.41\\ 53.49\\ 54.43\\ 55.70\end{array}$	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31 53.54 54.63 55.75 56.74 58.06	Jul         24.14         25.20         24.28         24.50         30.88         31.51         32.16         32.73         33.49         36.32         37.07         37.82         38.49         39.39         40.20         41.02         41.74         42.72	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15 18.46 18.90 19.29 19.68 20.02 20.50	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.23 16.51 16.23 16.51 16.23 16.51 16.90 17.25 17.60 17.91 18.33 18.71 19.09 19.42 19.88	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.37 24.381 24.37 24.381 24.37 25.83 26.43 26.43 26.43 26.97 27.53 28.01 28.66	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.81 37.68 38.45 39.24 39.24 39.92 40.86	Feb 0.00 32.88 30.88 39.16 39.96 40.78 41.50 42.47 43.34 44.23 45.01 46.06 47.00 47.97 48.81 49.95 50.97 52.02 52.93 54.17	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78 58.11 59.30 60.51 61.58 63.02	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2039 2030
25 25 32 33 34 34 36 36 36 37 38 39 40 40 41 42 43 44 45 46	Dec 38.92 33.55 34.29 34.57 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20 54.14 55.41 56.54 57.70 58.71 60.09 61.32	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89 45.68 46.75 47.71 48.69 49.54 50.70 51.74	Oct 29,49 26,86 27,60 34,74 35,45 36,18 36,18 36,81 37,67 38,45 39,23 39,92 40,86 41,86 41,86 43,30 44,31 45,22 46,14 45,22 46,14 46,96 48,05 49,04	$\begin{array}{r} 33.82\\ 32.95\\ 31.76\\ 32.03\\ 40.27\\ 41.09\\ 41.93\\ 42.67\\ 43.67\\ 44.56\\ 45.48\\ 46.28\\ 47.36\\ 48.33\\ 49.32\\ 50.19\\ 51.36\\ 52.41\\ 53.49\\ 54.43\\ 55.70\\ 56.84 \end{array}$	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31 53.54 54.63 55.75 56.74 58.06 59.25	Jul         24.14         25.20         24.28         24.28         24.50         24.51         30.88         31.51         32.73         33.49         34.18         35.49         36.32         37.07         38.49         39.39         40.20         41.74         42.72         43.59	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.40 16.73 17.02 17.43 17.78 18.15 18.46 18.90 19.29 19.68 20.02 20.50 20.92	Portland enewable Off-Pea 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.51 16.90 17.25 17.60 17.91 18.33 18.71 19.09 19.42 19.88 20.29	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.37 24.37 25.38 25.38 26.43 26.43 26.97 27.53 28.01 28.01 28.66 29.25	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.18 36.81 37.68 38.45 39.24 39.92 40.86 41.70	Feb 0.00 32.88 30.88 31.14 39.96 40.78 41.50 42.47 43.34 44.23 45.01 46.06 47.00 47.97 48.81 49.95 50.97 52.02 52.93 54.17 55.28	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78 58.11 59.30 60.51 61.58 63.02 64.31	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2037 2038 2039 2040 2041 2042
25 25 32 33 34 34 36 36 36 36 36 37 38 39 40 40 40 40 40 40 41 42 43 44 45 46 47	Dec 38.92 33.55 34.27 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20 54.14 55.41 56.54 57.70 58.71 60.09 61.32 62.57	Nov 29,49 28,31 28,88 29,13 36,65 37,40 38,17 38,84 39,75 40,56 41,40 42,12 43,11 43,99 44,89 44,89 45,68 46,75 47,71 48,69 49,54 50,70 51,74 52,80	Oct 29,49 26,86 27,60 34,74 35,45 36,18 36,81 37,67 38,45 39,23 39,92 40,86 41,70 40,86 41,70 43,30 44,31 45,22 46,14 46,96 49,04 50,04	$\begin{array}{r} 33.82\\ 32.95\\ 31.76\\ 32.03\\ 40.27\\ 41.09\\ 41.93\\ 42.67\\ 43.67\\ 43.67\\ 44.56\\ 45.48\\ 46.28\\ 47.36\\ 48.33\\ 49.32\\ 50.19\\ 51.36\\ 52.41\\ 53.49\\ 54.43\\ 55.70\\ 56.84\\ 58.01\\ \end{array}$	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31 53.54 54.63 55.75 56.74 58.06 59.25 60.47	set Study olar Jul 24.14 25.20 24.28 24.50 30.88 31.51 32.16 32.73 33.49 34.18 34.88 35.49 36.32 37.07 37.82 38.49 39.39 40.20 41.02 41.74 42.72 43.59 44.49	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15 18.46 18.90 19.29 19.68 20.02 20.50 20.92 21.34	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.90 17.25 17.60 17.91 18.33 18.71 19.09 19.42 19.88 20.29 20.70	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.83 26.43 26.97 27.53 28.01 28.66 29.25 29.85	Mar 0.00 26.76 23.21 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.81 37.68 38.45 39.24 39.92 40.86 41.70 42.55	Feb         0.00         32.88         30.88         31.14         39.16         39.96         40.78         41.50         42.47         43.34         45.01         46.06         47.00         47.97         48.81         49.95         50.97         52.02         52.93         54.17         55.28         56.41	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.358 54.68 56.78 58.11 59.30 60.51 61.58 63.02 64.31 65.63	Year 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2035 2036 2037 2038 2039 2040 2041 2042 2043
25 25 32 33 34 34 36 36 36 36 36 36 36 36 36 36 34 1 42 40 40 40 40 40 40 40 40 40 40 47 47	Dec 38.92 33.55 34.57 43.44 44.33 45.24 45.24 45.24 45.06 49.06 49.02 52.14 53.20 52.14 53.20 52.14 55.41 55.57 58.71 58.57 58.5	Nov 29.49 28.31 28.88 29.13 36.65 37.40 38.17 38.84 39.75 40.56 41.40 42.12 43.11 43.99 44.89 45.68 46.75 47.71 48.69 49.54 50.70 51.74 52.80 53.73	Oct 29.49 26.85 27.60 34.74 35.45 36.81 37.67 38.45 39.23 39.92 40.86 41.70 42.55 43.30 44.31 45.22 46.14 45.22 46.14 45.04 50.04 50.92	33.82 32.95 31.76 32.03 40.27 41.09 41.93 42.67 43.67 44.56 45.48 46.28 47.36 48.33 49.32 50.19 51.36 52.41 53.49 54.43 55.70 56.84 58.01 59.03	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31 53.54 53.54 53.54 55.75 56.74 58.06 59.25 60.47 61.53	set Study olar Jul 24.14 25.20 24.28 24.50 30.88 31.51 32.16 32.73 33.49 34.18 34.88 35.49 36.32 37.07 37.82 38.49 36.32 37.07 37.82 38.49 39.39 40.20 41.02 41.74 42.72 43.59 44.49 45.27	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 14.82 15.12 15.43 15.70 16.07 16.07 16.40 16.73 17.70 17.43 17.78 18.15 18.46 18.90 19.29 19.68 20.02 20.50 20.92 21.34 21.72	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.51 16.23 16.51 16.23 16.51 16.90 17.25 17.60 17.91 18.33 18.71 19.09 19.42 19.88 20.29 20.70 21.06	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.83 26.43 26.97 27.53 28.01 28.66 29.25 29.25 29.85 30.37	Mar 0.00 26.76 23.21 23.42 29.54 30.14 30.76 31.30 32.03 32.03 32.69 33.36 33.94 34.74 35.45 36.81 37.68 38.45 39.24 39.92 40.86 41.70 42.55 43.30	Feb         0.00         32.88         30.88         31.14         39.16         39.96         40.78         41.50         42.47         43.34         44.23         45.01         46.06         47.00         47.97         48.81         49.95         50.97         52.02         52.93         54.17         55.28         56.41         57.41	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.80 56.78 58.11 59.30 60.51 61.58 63.02 64.31 65.63 66.78	Year 2021 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2041 2043 2044
25 25 32 33 34 34 36 36 36 36 36 37 38 39 40 40 40 40 40 40 41 42 43 44 45 46 47	Dec 38.92 33.55 34.27 43.44 44.33 45.24 46.03 47.11 48.07 49.06 49.92 51.09 52.14 53.20 54.14 55.41 56.54 57.70 58.71 60.09 61.32 62.57	Nov 29,49 28,31 28,88 29,13 36,65 37,40 38,17 38,84 39,75 40,56 41,40 42,12 43,11 43,99 44,89 44,89 45,68 46,75 47,71 48,69 49,54 50,70 51,74 52,80	Oct 29,49 26,86 27,60 34,74 35,45 36,18 36,18 36,81 37,67 38,45 39,23 39,92 40,86 41,70 40,86 41,70 43,30 44,31 45,22 46,14 46,96 49,04 50,04	$\begin{array}{r} 33.82\\ 32.95\\ 31.76\\ 32.03\\ 40.27\\ 41.09\\ 41.93\\ 42.67\\ 43.67\\ 43.67\\ 44.56\\ 45.48\\ 46.28\\ 47.36\\ 48.33\\ 49.32\\ 50.19\\ 51.36\\ 52.41\\ 53.49\\ 54.43\\ 55.70\\ 56.84\\ 58.01\\ \end{array}$	37.90 34.37 33.13 33.40 41.97 42.83 43.71 44.48 45.52 46.45 47.40 48.24 49.37 50.38 51.41 52.31 53.54 54.63 55.75 56.74 58.06 59.25 60.47	set Study olar Jul 24.14 25.20 24.28 24.50 30.88 31.51 32.16 32.73 33.49 34.18 34.88 35.49 36.32 37.07 37.82 38.49 39.39 40.20 41.02 41.74 42.72 43.59 44.49	Avoided Cc k Energy, S Jun 8.08 10.53 11.48 11.62 15.12 15.43 15.70 16.07 16.40 16.73 17.02 17.43 17.78 18.15 18.46 18.90 19.29 19.68 20.02 20.50 20.92 21.34	Portland enewable Off-Pea May 8.59 7.74 11.12 11.26 14.37 14.67 14.97 15.23 15.59 15.91 16.23 16.51 16.90 17.25 17.60 17.91 18.33 18.71 19.09 19.42 19.88 20.29 20.70	Apr 0.00 15.56 16.19 16.35 20.72 21.15 21.58 21.96 22.47 22.93 23.40 23.81 24.37 24.87 25.38 25.83 26.43 26.97 27.53 28.01 28.66 29.25 29.85	Mar 0.00 26.76 23.21 29.54 30.14 30.76 31.30 32.03 32.69 33.36 33.94 34.74 35.45 36.81 37.68 38.45 39.24 39.92 40.86 41.70 42.55	Feb         0.00         32.88         30.88         31.14         39.16         39.96         40.78         41.50         42.47         43.34         45.01         46.06         47.00         47.97         48.81         49.95         50.97         52.02         52.93         54.17         55.28         56.41	b Jan 0.00 36.96 35.98 36.27 45.56 46.49 47.44 48.28 49.41 50.42 51.45 52.36 53.58 54.68 55.358 54.68 56.78 58.11 59.30 60.51 61.58 63.02 64.31 65.63	2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2036 2037 2038 2039 2040 2041 2042 2043

		d General Electric	
		ble Avoided Cost Stu	Jd
	Integrat	ion Costs	
Table R.4		Nominal \$/MWh	
Year	Wind	Solar	_
2021	0.33	1.38	
2022	0.34	1.41	
2023	0.35	1.44	
2024	0.35	1.47	
2025	0.36	1.50	
2026	0.37	1.53	
2027	0.37	1.56	
2028	0.38	1.59	
2029	0.39	1.63	
2030	0.40	1.66	
2031	0.41	1.69	
2032	0.41	1.73	
2033	0.42	1.76	
2034	0.43	1.80	
2035	0.44	1.84	
2036	0.45	1.87	
2037	0.46	1.91	
2038	0.47	1.95	
2039	0.48	1.99	
2040	0.49	2.03	T
2041	0.50	2.07	T
2042	0.51	2.12	T
2043	0.52	2.16	T
2044	0.53	2.21	T
2045	0.54	2.25	T
2046	0.55	2.30	T

							eral Electri					
							ded Cost S					
			Su	fficiency P	eriod: Proj	ected On F	Peak Delive	ered Whole	sale Prices	8	March C.M.	NA/1-
able R.5											Nominal \$/N	ivvn
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	18.89	21.19	46.77	75.47	61.20	37.75	38.26	50.4
2022	46.52	41.43	31.23	22.57	18.14	21.04	46.01	60.79	52.64	34.11	35.58	43.8
2023	42.88	38.78	31.01	26.25	23.59	27.07	44.74	56.82	45.21	34.14	35.50	42.1
2023	42.98	38.88	31.12	26.36	23.69	27.17	44.84	56.93	45.32	34.25	35.60	42.3
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	_	-
2020		-	-	-	-	-	-	-	-	-	_	-
2030	_	-	-	-		-	_	_				
2032	_	_	_	-	_	_	_	_	_			
2032	_	-	-	-	-	_	-	_		-		
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036		-	-	-			-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2030				-								
2039	-	-	-		-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-
							eral Electri					
							ded Cost St					
			Su	fficiency P	eriod: Proj	ected Off P	eak Delive	ered Whole	sale Prices	3		
able R.6											Nominal \$/M	IWh
Vee	len.	E.L	Max	A	Maria	hur	1.1	A	0	0-1	Neu	Dee
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	9.97	9.46	25.52	39.28	35.20	30.87	30.87	40.30
2022	38.37	34.29	28.17	16.97	9.15	11.95	26.61	35.78	34.37	28.26	29.72	34.96
2023	37.42	32.32	24.65	17.63	12.56	12.92	25.72	34.57	33.21	28.80	30.32	35.73
2024	37.74	32.61	24.89	17.82	12.73	13.09	25.97	34.87	33.50	29.07	30.60	36.04
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-
2027	-			-	-	-	-	-	-	-	-	-
2027 2028	-	-	-							-	-	-
2027 2028 2029		-	-	-	-	-	-	-	-	-		
2027 2028 2029 2030		-	-	-	-	-	-	-	-	-	-	-
2027 2028 2029 2030 2031	-		-		-			-	-	-	-	-
2027 2028 2029 2030 2031 2032		-	-	-	-	-	-	-	-	-	-	-
2027 2028 2029 2030 2031 2032 2033	-		-		-			-	-	-	-	-
2027 2028 2029 2030 2031 2032 2033 2034	- - - - -	- - -			-			-	-		- - -	
2027 2028 2029 2030 2031 2032 2033 2034 2035	- - - - -	- - - -	- - - - -	- - - -	- - - - -	- - - -	- - - -				- - -	
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036	- - - - - - -	- - - - -	- - - - -	- - - - -	- - - - - -	- - - - -	- - - - -	- - - -	- - - -	- - - -		
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037		- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - - -	- - - - - - -	- - - - - -	- - - - -	- - - - -	- - - - -		
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2036 2037 2038	- - - - - - - - - - - - -	- - - - - - - - - - -	-   -   -   -   -   -   -	- - - - - - - - -	- - - - - - - - - - - -	- - - - - - - - - - -	-   -   -   -   -   -   -	- - - - - - -	- - - - - - -	- - - - - - -		- - - - - -
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037		- - - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - - -	- - - - - - - -	-   -   -   -   -   -   -	- - - - - - - -		- - - - - - -
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2036 2037 2038		- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - - - -		- - - - - - - - -
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2036 2037 2038 2039		- - - - - - - - - - - -	- - - - - - - - - - - - - -	- - - - - - - - - - - - -	- - - - - - - - - - - -	- - - - - - - - - - - - -	- - - - - - - - - - - - -	- - - - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - - - - - - - -		- - - - - - - - - - -
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2035 2036 2037 2038 2039 2040								- - - - - - - - - - - - - - - -	- - - - - - - - - - - - - -	- - - - - - - - - - - - - -		- - - - - - - - - - - - - - -
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041										- - - - - - - - - - - - - - -		- - - - - - - - - - - - - - -
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2040 2041 2042										- - - - - - - - - - - - - - -		
2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2041 2042 2043										- - - - - - - - - - - - - - - - - - -		

						rtland Gen						
						vable Avoi						
				Deficie	ncy Period	: Value of V	Wind Capa	city, Flat \$	/MWh			
Table R.7										1	Nominal \$/N	IWh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67
2026	8.84	8.84	8.84	8.84	8.84	8.84	8.84	8.84	8.84	8.84	8.84	8.84
2027	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02
2028	9.18	9.18	9.18	9.18	9.18	9.18	9.18	9.18	9.18	9.18	9.18	9.18
2029	9.40	9.40	9.40	9.40	9.40	9.40	9.40	9.40	9.40	9.40	9.40	9.40
2030	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59	9.59
2031	9.79	9.79	9.79	9.79	9.79	9.79	9.79	9.79	9.79	9.79	9.79	9.79
2032	9.96	9.96	9.96	9.96	9.96	9.96	9.96	9,96	9.96	9.96	9.96	9.96
2033	10.19	10.19	10.19	10.19	10.19	10.19	10.19	10.19	10.19	10.19	10.19	10.19
2034	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40	10.40
2035	10.61	10.61	10.61	10.61	10.61	10.61	10.61	10.61	10.61	10.61	10.61	10.61
2036	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
2037	11.05	11.05	11.05	11.05	11.05	11.05	11.05	11.05	11.05	11.05	11.05	11.05
2038	11.28	11.28	11.28	11.28	11.28	11.28	11.28	11.28	11.28	11.28	11.28	11.28
2039	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51
2040	11.71	11.71	11.71	11.71	11.71	11.71	11.71	11.71	11.71	11.71	11.71	11.71
2041	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99	11.99
2042	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23
2043	12.48	12.48	12.48	12.48	12.48	12.48	12.48	12.48	12.48	12.48	12.48	12.48
2044	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
2045	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00
2046	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27
	, , , ,	,	, , , , , , , , , , , , , , , , , , , ,			rtland Gen						
						vable Avoi						
				De	ficiency Pe				h			
Table R.8										1	Nominal \$/N	lWh
N	1	<b>5</b> -1	14	A ===	Maria	l	1.1	A	0	0-1	Neu	Dee
Year	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04
2026	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06

2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04
2026	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06	51.06
2027	52.11	52.11	52.11	52.11	52.11	52.11	52.11	52.11	52.11	52.11	52.11	52.11
2028	53.03	53.03	53.03	53.03	53.03	53.03	53.03	53.03	53.03	53.03	53.03	53.03
2029	54.27	54.27	54.27	54.27	54.27	54.27	54.27	54.27	54.27	54.27	54.27	54.27
2030	55.38	55.38	55.38	55.38	55.38	55.38	55.38	55.38	55.38	55.38	55.38	55.38
2031	56.51	56.51	56.51	56.51	56.51	56.51	56.51	56.51	56.51	56.51	56.51	56.51
2032	57.51	57.51	57.51	57.51	57.51	57.51	57.51	57.51	57.51	57.51	57.51	57.51
2033	58.85	58.85	58.85	58.85	58.85	58.85	58.85	58.85	58.85	58.85	58.85	58.85
2034	60.06	60.06	60.06	60.06	60.06	60.06	60.06	60.06	60.06	60.06	60.06	60.06
2035	61.29	61.29	61.29	61.29	61.29	61.29	61.29	61.29	61.29	61.29	61.29	61.29
2036	62.37	62.37	62.37	62.37	62.37	62.37	62.37	62.37	62.37	62.37	62.37	62.37
2037	63.83	63.83	63.83	63.83	63.83	63.83	63.83	63.83	63.83	63.83	63.83	63.83
2038	65.13	65.13	65.13	65.13	65.13	65.13	65.13	65.13	65.13	65.13	65.13	65.13
2039	66.47	66.47	66.47	66.47	66.47	66.47	66.47	66.47	66.47	66.47	66.47	66.47
2040	67.64	67.64	67.64	67.64	67.64	67.64	67.64	67.64	67.64	67.64	67.64	67.64
2041	69.22	69.22	69.22	69.22	69.22	69.22	69.22	69.22	69.22	69.22	69.22	69.22
2042	70.64	70.64	70.64	70.64	70.64	70.64	70.64	70.64	70.64	70.64	70.64	70.64
2043	72.08	72.08	72.08	72.08	72.08	72.08	72.08	72.08	72.08	72.08	72.08	72.08
2044	73.36	73.36	73.36	73.36	73.36	73.36	73.36	73.36	73.36	73.36	73.36	73.36
2045	75.07	75.07	75.07	75.07	75.07	75.07	75.07	75.07	75.07	75.07	75.07	75.07
2046	76.61	76.61	76.61	76.61	76.61	76.61	76.61	76.61	76.61	76.61	76.61	76.61

						tland Gen						
						vable Avoi						
			Defici	ency Peri	od: Full Wi	nd Cost - V	alue of Wi	nd Capaci	ty, Flat \$/M			
Table R.9											Nominal \$/N	/Wh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	oun	105		7.01	-	-	-	-	-	-	-	
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	41.37	41.37	41.37	41.37	41.37	41.37	41.37	41.37	41.37	41.37	41.37	41.3
2026	42.22	42.22	42.22	42.22	42.22	42.22	42.22	42.22	42.22	42.22	42.22	42.22
2027	43.09	43.09	43.09	43.09	43.09	43.09	43.09	43.09	43.09	43.09	43.09	43.0
2028	43.85	43.85	43.85	43.85	43.85	43.85	43.85	43.85	43.85	43.85	43.85	43.8
2029	44.87	44.87	44.87	44.87	44.87	44.87	44.87	44.87	44.87	44.87	44.87	44.8
2030	45.79	45.79	45.79	45.79	45.79	45.79	45.79	45.79	45.79	45.79	45.79	45.7
2031	46.73	46.73	46.73	46.73	46.73	46.73	46.73	46.73	46.73	46.73	46.73	46.7
2032	47.55	47.55	47.55	47.55	47.55	47.55	47.55	47.55	47.55	47.55	47.55	47.5
2033	48.66	48.66	48.66	48.66	48.66	48.66	48.66	48.66	48.66	48.66	48.66	48.6
2034	49.66	49.66	49.66	49.66	49.66	49.66	49.66	49.66	49.66	49.66	49.66	49.6
2035	50.68	50.68	50.68	50.68	50.68	50.68	50.68	50.68	50.68	50.68	50.68	50.6
2036	51.57	51.57	51.57	51.57	51.57	51.57	51.57	51.57	51.57	51.57	51.57	51.5
2037	52.77	52.77	52.77	52.77	52.77	52.77	52.77	52.77	52.77	52.77	52.77	52.7
2038	53.85	53.85	53.85	53.85	53.85	53.85	53.85	53.85	53.85	53.85	53.85	53.8
2039	54.96	54.96	54.96	54.96	54.96	54.96	54.96	54.96	54.96	54.96	54.96	54.9
2040	55.93	55.93	55.93	55.93	55.93	55.93	55.93	55.93	55.93	55.93	55.93	55.9
2041	57.23	57.23	57.23	57.23	57.23	57.23	57.23	57.23	57.23	57.23	57.23	57.2
2042	58.40	58.40	58.40	58.40	58.40	58.40	58.40	58.40	58.40	58.40	58.40	58.4
2043	59.60	59.60	59.60	59.60	59.60	59.60	59.60	59.60	59.60	59.60	59.60	59.6
2044	60.66	60.66	60.66	60.66	60.66	60.66	60.66	60.66	60.66	60.66	60.66	60.6
2045	62.07	62.07	62.07	62.07	62.07	62.07	62.07	62.07	62.07	62.07	62.07	62.0
2046	63.34	63.34	63.34	63.34	63.34	63.34	63.34	63.34	63.34	63.34	63.34	63.3

## **Renewable Capacity Tables**

					Portland	General E	lectric					
				R	enewable	Avoided C	ost Study					
				(	On-Peak Ca	apacity, Ba	ase Load					
Table R10	.a										Nominal \$/I	MWh
								•		<u> </u>		_
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.31	26.3
2026	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.85	26.8
2027	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.40	27.4
2028	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.96	27.9
2029	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.54	28.5
2030	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.1
2031	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.7
2032	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.1
2033	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.95	30.9
2034	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.68	31.6
2035	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.23	32.2
2036	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.78	32.7
2037	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.5
2038	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.25	34.2
2039	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.95	34.9
2040	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.6
2041	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.4
2042	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.14	37.1
2043	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.91	37.9
2044	38.56	38,56	38.56	38.56	38.56	38,56	38,56	38.56	38.56	38.56	38.56	38.5
2045	39.60	39.60	39,60	39.60	39.60	39.60	39.60	39.60	39.60	39.60	39.60	39.6
2046	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.28	40.2
1					Portland	General E	lectric			i	i	
				R	enewable	Avoided C	ost Study					
				(	Off-Peak Ca	apacity, Ba	ase Load					
Table R.1	0b									I	Nominal \$/N	/Wh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-		-	-
2025	-	-	-	-	-	-		-	-	-	-	
2026	-	-	-	-	-	-	-		-	-	-	
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-		-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-

					Portla	nd Genera	I Electric					
					Renewal	ole Avoide	d Cost Stu	dy				
					On-Pe	eak Capac	ity, Wind					
Table R.11	1a										Nominal \$/N	/Wh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.4
2026	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.79	15.7
2027	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.11	16.1
2028	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.44	16.4
2029	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.7
2030	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.1
2031	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.47	17.4
2032	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.72	17.7
2033	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.2
2034	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.63	18.6
2035	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.95	18.9
2036	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.2
2037	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.73	19.7
2038	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.14	20.1
2039	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.55	20.5
2040	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.97	20.9
2041	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.4
2042	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.84	21.8
2043	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.29	22.2
2044	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.67	22.6
2045	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.28	23.2
2046	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.69	23.6

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

Cable D 4	11.				0.11	eak Capa	,,				Manufact 04	A A A A A
able R.1	D										Nominal \$/	vivvn
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
2032	-	-	-	-	-	-	-	-	-	-	-	-
2033	-	-	-	-	-	-	-	-	-	-	-	-
2034	-	-	-	-	-	-	-	-	-	-	-	-
2035	-	-	-	-	-	-	-	-	-	-	-	-
2036	-	-	-	-	-	-	-	-	-	-	-	-
2037	-	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-	-

					Portland	General E	lectric					
Renewable Avoided Cost Study												
On-Peak Capacity, Solar												
Table R.12	a										Nominal \$/N	/IWh
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	-	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-	-
2025	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.6
2026	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.7
2027	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84
2028	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.9
2029	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.0
2030	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.0
2031	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.1
2032	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.2
2033	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.3
2034	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.4
2035	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.52	4.5
2036	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.6
2037	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.7
2038	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.8
2039	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.9
2040	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.0
2041	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.1
2042	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.2
2043	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.3
2044	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.4
2045	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.55	5.5
2046	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.6

#### Portland General Electric

#### Renewable Avoided Cost Study Off-Peak Capacity, Solar

Off-Peak Capacity, Solar											
b										Nominal \$/	MWh
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
		Jan       Feb         -       - <td>Jan       Feb       Mar         -       -         -<!--</td--><td>Jan       Feb       Mar       Apr         Jan       Feb       Mar       Apr         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -</td><td>b       I       I       I         Jan       Feb       Mar       Apr       May         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       <tdi< td="">       I</tdi<></td><td>Ib       Image: second s</td><td>bImage: sector of the sector of t</td><td>bImage: sector of the sector of t</td><td>bImage of the second secon</td><td>bImage: series of the series of t</td><td>Ibb       Image       I</td></td>	Jan       Feb       Mar         -       -         - </td <td>Jan       Feb       Mar       Apr         Jan       Feb       Mar       Apr         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -</td> <td>b       I       I       I         Jan       Feb       Mar       Apr       May         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       <tdi< td="">       I</tdi<></td> <td>Ib       Image: second s</td> <td>bImage: sector of the sector of t</td> <td>bImage: sector of the sector of t</td> <td>bImage of the second secon</td> <td>bImage: series of the series of t</td> <td>Ibb       Image       I</td>	Jan       Feb       Mar       Apr         Jan       Feb       Mar       Apr         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -	b       I       I       I         Jan       Feb       Mar       Apr       May         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I       I       I         I       I       I <tdi< td="">       I</tdi<>	Ib       Image: second s	bImage: sector of the sector of t	bImage: sector of the sector of t	bImage of the second secon	bImage: series of the series of t	Ibb       Image       I

## PGE UM 1728

Application to Update Schedule 201 Avoided Cost Power Purchase Information

> Attachment C Filing Inputs

#### Worksheet Tab: Plant Capital Cost Inputs

				5/3/2021	4/6/20 F	iling
	Value	Units	\$ Year	Source	Value	\$ Yei
ple Cycle Combustion Thermal Plant Equipme	ent (1x0 GE 7H/	4.02)				
Class Casacity	356	MW		2010 JDD - Supply Side Deseurce Study - Series 20	356	
Clean Capacity				2019 IRP - Supply-Side Resource Study - Spring 20		
Degraded Capacity	347	MW		2019 IRP - Supply-Side Resource Study - Spring 20	347	
Overnight capital cost	181.044	(\$0005)	2018	2019 IRP LUCAS model	181,044	20
CO2 offset	3,674	(\$000s)	2017	2019 IRP revenue requirement model	3,674	20
Economic life	38	yrs.		2019 IRP - Supply-Side Resource Study - Spring 20	38	
Tax life	15	yrs.		no change	15	
Decommissioning cost	1,533	(\$000s)	2018	2019 IRP LUCAS model	1,533	20
In-service date	2025	(00002)			2025	
Start construction date	2023				2023	
EPC period	20	months		2019 IRP - Supply-Side Resource Study - Spring 20	20	
	20				20	
Capacity contribution	95.5%	%		2019 IRP Update	99.7%	
Interconnection Facilities	6,160	(\$000s)	2013	2019 IRP Update LUCAS model	6,160	
Interconnection Facilities	6,639	(\$000s)	2018	Calculation		
Network Upgrades	3,556	(\$000s)	2013	2019 IRP Update LUCAS model	3,556	
Network Upgrades	3,833	(\$000s)	2018	Calculation		
Interconnection and Network Upgrades	10,473	(\$000s)		Calculation		
bined Cycle Combustion Thermal Plant Fouin	ment (1x1 GF )	/HA.02)				
bined Cycle Combustion Thermal Plant Equip	ment (1x1 GE )	/HA.02)				
bined Cycle Combustion Thermal Plant Equip	517	/HA.02) MW		2019 IRP - Supply-Side Resource Study - Spring 20	517	
				2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20	517 503	
Clean Capacity Degraded Capacity	517 503	MW		2019 IRP - Supply-Side Resource Study - Spring 20	503	
Clean Capacity Degraded Capacity Overnight capital cost	517 503 459,128	MW MW (\$000s)		2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20	503 459,128	
Clean Capacity Degraded Capacity	517 503	MW		2019 IRP - Supply-Side Resource Study - Spring 20	503	
Clean Capacity Degraded Capacity Overnight capital cost	517 503 459,128	MW MW (\$000s)		2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20	503 459,128	
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset	517 503 459,128 9,277	MW MW (\$000s) (\$000s)		2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model	503 459,128 9,277	
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life Tax life	517 503 459,128 9,277 38 20	MW MW (\$000s) (\$000s) yrs.	2017	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model no change	503 459,128 9,277 38 20	20 20
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life	517 503 459,128 9,277 38	MW MW (\$000s) (\$000s)	2017	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model	503 459,128 9,277 38	
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life Tax life Decomissioning cost	517 503 459,128 9,277 38 20 2,450	MW MW (\$000s) (\$000s) yrs.	2017	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model no change	503 459,128 9,277 38 20 2,450	20
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life Tax life Decomissioning cost In-service date	517 503 459,128 9,277 38 20 2,450 2025	MW MW (\$000s) (\$000s) yrs.	2017	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model no change	503 459,128 9,277 38 20 2,450 2025	20
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life Tax life Decomissioning cost In-service date Start construction date EPC period	517 503 459,128 9,277 38 20 2,450 2025 2022 30	MW MW (\$000s) (\$000s) yrs. (\$000s) months	2017	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model no change 2019 IRP LUCAS model 2019 IRP LUCAS model 2019 IRP - Supply-Side Resource Study - Spring 20	503 459,128 9,277 38 20 2,450 2025 2022 30	20
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life Tax life Decomissioning cost In-service date Start construction date EPC period Interconnection Facilities	517 503 459,128 9,277 38 20 2,450 2025 2022 30 8,313	MW MW (\$000s) (\$000s) yrs. (\$000s) months (\$000s)	2017 2018 2013	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model no change 2019 IRP LUCAS model 2019 IRP LUCAS model 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP Update LUCAS model	503 459,128 9,277 38 20 2,450 2025 2022	20
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life Tax life Decomissioning cost In-service date Start construction date EPC period Interconnection Facilities Interconnection Facilities	517 503 459,128 9,277 38 20 2,450 2025 2022 30 8,313 8,961	MW MW (\$000s) (\$000s) yrs. (\$000s) months (\$000s) (\$000s)	2017 2018 2013 2013	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model no change 2019 IRP LUCAS model 2019 IRP LUCAS model 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP Update LUCAS model Calculation	503 459,128 9,277 38 20 2,450 2025 2022 30 8,313	20
Clean Capacity Degraded Capacity Overnight capital cost CO2 offset Economic life Tax life Decomissioning cost In-service date Start construction date EPC period Interconnection Facilities	517 503 459,128 9,277 38 20 2,450 2025 2022 30 8,313	MW MW (\$000s) (\$000s) yrs. (\$000s) months (\$000s)	2017 2018 2013 2013 2018 2013	2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP LUCAS model 2019 IRP PGE Zone Model no change 2019 IRP LUCAS model 2019 IRP LUCAS model 2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP Update LUCAS model	503 459,128 9,277 38 20 2,450 2025 2022 30	20

d Equipment (Gorge wind):						
Capacity	245	MW		2019 IRP - Supply-Side Resource Study - Spring 20	245	
					68	
Turbines	68	turbines		2019 IRP - Supply-Side Resource Study - Spring 20	68	
Overnight capital cost	369,222	(\$000s)	2018	2019 IRP - Supply-Side Resource Study - Spring 20	369,222	201
Annual capital reinvestment		\$s/MW				
PTC application	60%				60%	
Economic life	30			2019 IRP - Supply-Side Resource Study - Spring 20	30	
Tax life	5			no change	5	
Decommissioning cost	8,428	(\$000s)	2018	2019 IRP Update LUCAS model	8,428	201
In-service date	2025				2025	
Start construction date	2022				2022	
EPC period	27	months		2019 IRP - Supply-Side Resource Study - Spring 20	27	
Plant retirement						
Capacity contribution	25.0%	%		2019 IRP Figure 6-3, 100 MW incremental addition	28.6%	
Interconnection Facilities	15,061	(\$000c)	2013	2019 IRP LUCAS model	15,061	
Interconnection Facilities	16,234	A		Calculation	15,001	
Network Upgrades	3,556			2019 IRP LUCAS model	3,556	
Network Upgrades	3,833			Calculation	3,330	
Interconnection and Network Upgrades	20,067					
interconnection and network oppraces	20,007	(00003/	2010			
Workbook Tab: Plant Operating Par	ameters					
				5/3/2021	4/6/20 8	_
	Value	Units	\$ Year	Source	Value	\$Ye
Simple Cycle Combustion Thermal Plant Equ	ipment (1x	0 GE 7HA.02)				
Heat Rate (Degraded)	9,298	Btu/kWh		2019 IRP - Supply-Side Resource Study - Spring 20	9,298	
Fixed O&M	2.10	\$/kW-vr	2018	2019 IRP - Supply-Side Resource Study - Spring 20	2.10	201
Variable 0&M	9.69			2019 IRP - Supply-Side Resource Study - Spring 20	9.69	20
Insurance	0.17	5/100 project cost			0.17	202
Materials inventory	4.90	\$/kW degraded			4.90	20
Net Energy Value: revenues - variable co	0.39	\$/kW-vr	2020	2019 IRP Update PGE Zone Model	0.49	202
Flexibility value	4.82			2019 IRP table 6-5	4.82	20
Contingency reserves (%)		%				
Spinning reserves	-	\$/MWh				
Supplemental reserves	-	S/MWh				
Contingency reserves cost		\$/MWh				
Availability factor	-	3/14/44/1				
	_	70				
Ancillary services cost						

Combined Cycle Combustion Thermal Plant	Equipment	(1x1 GE 7HA.02)				
Heat Rate (Degraded)	6,362	Btu/kWh		2019 IRP - Supply-Side Resource Study - Spring 20	6,362	
· - · ·						
Fixed O&M	6.57	\$/kW-yr	2018	2019 IRP - Supply-Side Resource Study - Spring 20	6.57	20
Variable O&M	0.72	\$/MWh		2019 IRP - Supply-Side Resource Study - Spring 20		20
Insurance	0.17	5/100 project cost		, -, -, -, -, -, -, -, -, -, -, -, -	0.17	20
Materials inventory	2.49	\$/kW degraded			2.49	20
Availability factor	94.01%			2019 IRP - Supply-Side Resource Study - Spring 20	94.01%	
				,,,,,		
Contingency reserves (%)	-	%				
Spinning reserves	-	\$/MWh				
Supplemental reserves	-	\$/MWh				
Contingency reserves cost	-	\$/MWh				
Schedule outage rate	-	%				
Gorge Wind						
Fixed O&M	37.00	\$/kW-yr	2018	2019 IRP - Supply-Side Resource Study - Spring 20	37.00	20
Theo oaw	57.00	S/ KWV-YI	2010	2015 Mill Supply Side Resource Study Spring 20	57.00	
Capacity factor (flat)	40.80%			2019 IRP - Supply-Side Resource Study - Spring 20	40.80%	
Capacity factor (peak)	39.97%			2019 IRP - Supply-Side Resource Study - Spring 20 2019 IRP - Supply-Side Resource Study - Spring 20		
Annual output	33.3776	MWb		2019 IKP - Suppry-Side Resource Study - Spring 20	874,935	
Land royalties	1.70	\$/MWh	2019	2019 IRP - Supply-Side Resource Study - Spring 20		20
Insurance		5/100 project cost	2018	2019 IKP - Supply-Side Resource Study - Spring 20	0.08	20
Capacity contribution	0.08		0		28.57%	21
capacity contribution	0.00%				28.5776	
Seienies reserves		%				
Spinning reserves	-	70				
Contingency reserves cost	-					
Solar						
					25.277	
Capacity factor (peak)	36.87%			2019 IRP New Solar profile	36.87%	
Capacity contribution	5.50%			2019 IRP Update	15.78%	
BPA line loss	1.90%			No change	1.90%	
BFA THE IOSS	1.50%			No change	1.50%	
Workboook Tab: Financial and Tax P	arameter	S				
				5/3/2021	4/6/20	Filing
	Value			Source	Value	
Composite Income Tax Rate	27.35%			2019 IRP - Appendix I Table I-1	27.35%	
Debt Portion of Capitalization	50.00%			2019 IRP - Appendix I Table I-1	50.00%	
Common Stock Portion of Capitalization	50.00%			2019 IRP - Appendix I Table I-1	50.00%	
Property Tax Rate	1.45%			2016 IRP Update, Section 7	1.45%	
Inflation Rate	2.05%			2019 IRP - Appendix I Table I-1	2.05%	
Common Return	9.50%			2019 IRP - Appendix I Table I-1	9.50%	
Debt Return	4.94%			2019 IRP - Appendix I Table I-1	4.94%	
Pre-Tax Nominal Cost of Capital	4.75%			calculation	7.22%	
- 11 - 11	65.79%			calculation	65.79%	
Equityportion After-Tax Nominal Cost of Capital	6.54%			calculation	6.54%	

## **CERTIFICATE OF SERVICE**

I hereby certify that I have this day caused the Documents in UM 1728 to be served by electronic mail to those parties whose e-mail addresses appear on the attached service list for OPUC Docket UM 1728.

Dated at Portland, Oregon, this 3<sup>rd</sup> day of May, 2021.

## /s/ Robert Macfarlane

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